HEALTH PROFILE OF THE ELDERLY IN RURAL AND URBAN FIELD PRACTICE AREAS-A COMPARATIVE CROSS-SECTIONAL STUDY.

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Dissertation submitted to

BLDE (Deemed to be University) Vijayapur, Karnataka

In partial fulfillment of the requirements for the degree of

DOCTOR OF MEDICINE IN

COMMUNITY MEDICINE

Under the guidance of

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SHRI B.M.PATIL MEDICAL COLLEGE

HOSPITAL & RESEARCH CENTRE, VIJAYAPUR

KARNATAKA

2020

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LIST OF ABBREVIATIONS USED

WHO	: World Health Organization
BMI	: Body Mass Index
QOL	: Quality of life
SPSS	: Statistical Package for Social Science
SD	:Standard Deviation.
SES	:Socioeconomic Status

Abstract

Introduction: Aging is said to be an irreversible and multifactorial process. WHO has defined old age as "the period of life when the impairment of physical and mental functions become increasingly manifested by comparison to the previous period of life". It takes place at the biological and physiological level. At the biological level, aging is due to the impact of molecular and cellular damage over time. At the physiological level, aging is the physical changes an individual experiences because of a decline in the body's usual functioning causing poor morbidity, vision, hearing, inability to eat and digest, poor memory, inability to control certain physiological functions, and various chronic conditions. Apart from biological changes, aging is also associated with other transitions like retirement, relocation to more appropriate housing, and the death of friends and partners.

In the year 2021 in India, there were nearly 138 million elderly persons (aged 60 years or above); 71 million females and 67 million males. It had risen from 24 million in 1961 to 55 million in 1991 and currently is projected to 194 million for the year 2031, comprising of 101 million females and 93 million males. Hence, it can be said that the increase in life expectancy brings new opportunities not only for the elderly but also for society. The elderly are a vital asset for a nation because of their experience and wisdom. But these opportunities depend on health. Increased life expectancy hence comes with its new problems. The

challenge for health care in coming years is to ensure proper quality of life for the geriatric population. The population of the elderly in Vijayapura according to the Government of Karnataka is 1,98,300 which includes 92,770 males and 1,05,530 females. The majority of the elderly population lives in rural areas (76.48%) which is devoid of basic amnesties. Thus, to plan health care facilities for the elderly in this part of northern Karnataka would require information and analysis of the existing situation. Not many studies have been carried out here before regarding the health profile of the elderly in and around Vijayapura district. Hence this study attempts to assess the health profile of elderly people in urban and rural areas of Vijayapura district.

Objectives:

1. To find out the morbidity pattern among the geriatric age group.
2. To assess the Quality of Life of the elderly by using the WHO Quality of Life BREF Questionnaire.
3. To study the sociodemographic profile and compare the health profile among the rural and urban elderly population.

Materials and Methods: A cross sectional study was conducted in the rural and urban field practice areas of a tertiary care hospital. Complete enumeration of all the houses under RHTC and UHTC area was done to list all the eligible participants residing in the area. After obtaining the ethical clearance from the

Institutional Ethical Committee the study was undertaken. Participants were interviewed using pretested and semi-structured questionnaire for information regarding Socio-demographic profile, Present health status and any existing morbidities. Hamilton Mental Health Questionnaire, WHO Quality of Life BREF Questionnaire, Katz Activity of Daily Living Questionnaire and Questionnaires related to General physical examination were used, the systemic examination was done, and anthropometric measurement that includes: Height, Weight, BMI, using standard operating procedures were performed.

Vitals include Pulse rate, Blood pressure, and Respiratory rate.

Investigations:

Random blood sugar by glucometer (Brand-Gluco One)

Haemoglobin by automated haemoglobin meter (Brand-Acon Mission Hb testing System)

Results: A total of 350 participants 175 from rural area and 175 from urban area were included in the study. Majority of the study population falls between the age group ranging between 60 to 69 years both in rural and urban area and belong to upper middle-class family (43.7%). Majority (61.7%) of the participants were males. The prevalence of morbidities found in this study were hypertension(34.3%), diabetes (24.6%), joint pain (47.1%), impaired vision

(27.4%), impaired hearing (24.6%), breathlessness (15.1%), depression (9.1%), dental problems (17.4%), anaemia (8%), gastritis (6%) and urinary tract infection (4.3%). Most of the participants (50%) were having a fair quality of life.

Conclusion: The present study concludes that health demand in the elderly age group is a priority in Indian scenario both in urban or rural areas due to increase in life expectancy and growing population of the elderly. Efforts are needed to educate and make these elderly aware about healthy ageing.

Key words: *Urban, Rural, Elderly, Morbidities, Mental Health, Quality of Life.*

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Introduction

Ageing is said to be a universal phenomenon.

Sir James Ross had said "you can't heal old age, you protect it, promote it and extend it."

Through advancements in modern medicine and technology the world population has changed from a trend of high birth rates and death rates to low birth rates and death rates resulting in greying of the population [(1)]. This process where older people are starting to form a higher proportion of the total population in a community is called as "population ageing"[(2)].

In India too population ageing is emerging due to increase in life expectancy and decrease in fertility as a result of better medical facilities and improved public health respectively.

Aging is said to be an irreversible and multifactorial process. WHO has defined old age as "the period of life when the impairment of physical and mental functions become increasingly manifested by comparison to the previous period of life" [(3)]. It takes place at the biological and physiological level. At the biological level, aging is due to the impact of molecular and cellular damage over time[(4)]. At the physiological level, aging is the physical changes an

individual experiences because of a decline in the body's usual functioning causing poor morbidity, vision, hearing, inability to eat and digest, poor memory, inability to control certain physiological functions, and various chronic conditions[5]. Apart from biological changes, aging is also associated with other transitions like retirement, relocation to more appropriate housing, and the death of friends and partners[6].

Regarding the beginning of old age, different people and different countries have set this at different ages. Hippocrates (460-370 BC) of Greece set the beginning of old age at 56 years. The United Nations, through the World Health Organization (WHO) in 1980, officially defined 60 years as the age of transition of people to the elderly segment of the population. In India, the National Policy on Older Persons 1999 adopted by the Government of India defines senior citizens or elderly as a person who is of age 60 years or above[7].

Life expectancy at birth has increased more in recent years. It is expected to be 67 years in 2011-2016 for males and 69 years for females in India[8]. It is expected that number of older people would soon outnumber that of children below 5 years of age. The reasons for the increase in life expectancy are improved medical facilities, better nutritional status, good living conditions, and food security. The increased life expectancy in the elderly has changed the spectrum of diseases towards non-communicable from communicable.

In terms of morbidity 6% of India's aged, are immobile, 50% of the elderly suffer from chronic diseases, visual and hearing impairments are highly prevalent. Old age is hence a period of multiple illnesses and general disability. The elderly are more vulnerable to disease because of decreased physiological reserves and compromised defense mechanisms[(9)]. Further, a large portion of geriatric morbidity remains hidden due to ignorance and poor access to health care[(10)]. Studies done in rural India have shown that in the elderly chronic illness is more common than others[(11)]. Therefore, the elderly are high-risk groups in terms of health in any society.

Apart from the physiological causes health status in general and morbidity in particular in elderly are also influenced by behavioral decisions of individuals and families apart from genetically inherited health characteristics, environment in which they reside and also changes in their socioeconomic status which effect the individual's way of life after retirement. Thus, illness in elderly is not a random event but it's one that is related to household as well as community level factors[(11)].

Other problems associated with the elderly are psychosocial problems and providing economic support. Common psychosocial problems include impaired memory and intelligence, anxiety, depression, rigidity of outlook, dependency and dissatisfaction with family members, earning and occupation.

Thus, collection of population-based data on health problems, functional status, behavioural risk factors, health care utilisation, social circumstances are imperative for public health interventions with geriatric population [(12)].

Hence, it can be said that the increase in life expectancy brings new opportunities not only for the elderly but also for society. The elderly are a vital asset for a nation because of their experience and wisdom[(13)]. But these opportunities depend on health. Increased life expectancy hence comes with its new problems. The challenge for health care in the upcoming years is to ensure proper quality of life for the geriatric population.

Today the world's population aged 60 and above is 1.05 billion while 80 and above is 142 million, which is expected to be 2.1 billion and 426 million respectively by 2050[(4)]. The Indian population of older persons is currently the second-largest in the world. In the year 2021 in India, there were nearly 138 million elderly persons (aged 60 years or above); 71 million females and 67 million males. It has risen from 24 million in 1961 to 55 million in 1991 and is projected to 194 million for the year 2031, comprising of 101 million females and 93 million males. The growth rate of the older population is projected at 4.1% in the coming decade[(14)].

Need for the Study

The needs and problems of the elderly are different from the younger population and depend on their demographic profile. The old-age dependency

ratio (12%) is rising in India[15]. Living conditions, availability of resources and facilities for elderly are notably different in urban societies or rural societies, and comparative studies between them are scarce[16]. Hence information on the morbidity profile of the elderly is needed for planning health care services or national programs for the elderly. The health services to this group are currently contained within the general health services without any special emphasis; further the rural elderly are in special need, who comprise more than 66% of India's elderly[13].

Vijayapura is a big district in the northern part of Karnataka state, having a population of 2177331 and is the seventh most populous district in the state. The population of the elderly in Vijayapura according to the Government of Karnataka is 1,98,300 which includes 92,770 males and 1,05,530 females[17]. The majority of the elderly population lives in rural areas (76.48%) which is devoid of basic amnesties[17]. Thus, to plan health care facilities for the elderly in this part of northern Karnataka would require information and analysis of the existing situation. Not many studies have been carried out here before regarding the health profile of the elderly in and around Vijayapura district. Hence this study was an attempt to assess the health profile of elderly people in urban and rural areas of Vijayapura district.

Objectives

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Review of Literature

History

Manusmriti an ancient law giver wrote the *Varnasarma Dharma* which tells about the four stages of life as *Brahmacharya* or the student life, *Grahastha* or life of a householder, *Vanaprastha* or life of a hermit and *Samnyasa* or life of a wandering ascetic. The basic experiences of life in accordance with religion, family and society and made the related classes to accommodate these experiences. These were arranged to give experiences of this worldly life and their renunciation later.

In the book *Yajna Valkya Smriti* the elderly are divided into four groups that are, people who are old *knowledge wise,* those who are old *age-wise,* those who are old *action-wise* and those who are old *wealth-wise.*

According to the book *Shanthi Kamalakara* of the Hindu scripture at the age of 60 a person becomes more susceptible to death and at this time gets bad dreams about death as premonition.[(18)]

Vedic Concept of Old Age and Death:

During the early Vedic period there was an unreasonable fear of the afterlife. By 1000-800 BC the Vedic society had partially overcome this fear. Knowledge and awareness about death had then become common. At the time of

compilation of the Upanishads, death no longer had a mythical power over the living. Words such as *amara* meaning deathless and ageless and *nirjara* meaning free from old age were in use. It was told old age was inevitable and incurable. (18)

Ayurvedic Concept of Old Age and Death:

According to the *Charaka Samhita*, *Rasayana chikithsa* is the branch of Ayurveda dealing with gerontological medicine. The word *jara* has been mentioned which means "running out of years and changes occurring with time." Old age has been considered as a natural process of life occurring as changes despite the normal intake of food. *Rasayanas* cannot cure ageing although it can delay the changes of ageing temporarily. (18)

Jain Concept of Ageing:

It was advised in Jainism that in old age life can be made meaningful by following the path of *righteousness* and *dharma.* Since old age and death were inevitable people were asked not to get attached to life and its desires. (18)

Buddhist Concepts of Ageing:

According to Buddhism the stages of life are *brahmacharin* or scholar life, *grhasta* or household life, *bhiksu* the stage of beggar and *vaikhanasa* the stage

of hermit life. In Buddhism old age was associated with disease and suffering and Nirvana was the answer to this. [18]

WHO Definition of Elderly:

The elderly have been defined by the WHO as those above the age of 60 years and old age has been categorized into the young old: 60-69 years, the old old: 70-79 years and the oldest old: 80 years and above.[19]

Geriatrics

It is the science that deals with the study of diseases and their treatment peculiar to old age.

Gerontology

It is the study of physiological and psychological changes, which are incidental to old age.

Ageing

Ageing or senescence may be defined as the post maturational processes that are deteriorative to life and lead to increased vulnerability and death.

Some of the characteristics associated with ageing are increased mortality with age, a wide range of progressive deteriorative physiological changes with age, lack of one's ability to respond adaptively to environmental changes with age as well as an increased vulnerability to diseases with increasing age.[20]

United Nations (1980) considers 60yrs as the age of transition to elderly age group.

In India people aged 60yrs and above are treated as old age and is often classified into,

Early old age – up to 75 years (elderly)

Late old age – more than 75 years (very elder) [85]

World History of Geriatrics

The word geriatrics was invented by Igmatz L. Nascher in 1909 and suggested geriatrics should be assigned a special branch of medicine. He was called as **father** of geriatrics medicine.

Nascher Viennese born immigrant to the United States and his initiative provided a stimulus for social and biological research on ageing, but clinical geriatrics did not flourish in the United States. [86]

Geriatric medicine had its beginning in Britain in 1930's when Marjorie Warren who created first geriatric unit in 1935 in UK. As well as being a pioneer of rehabilitative for disabled elderly people, addressing un-addressed problems, she then started to be known as **mother** of Geriatrics. [87]

In 1959 the British Geriatric Society was formed to emphasize the scientific basis of elderly medicine. [88]

Indian History of Geriatrics

In India recognition of gerontology as a discipline came with the setting up of Indian Gerontological Association in 1968. In 1982, Association of Gerontology India (AGI) established at Varnasi.

WHO's first world assembly on ageing which was held in Vienna in 1982, gave an added impetus to research on ageing in the country[89].

In the year 1999 through the National Institute of Social Defence, the government established a national policy for old persons. This policy purpose was to advice the government and co-ordinate services for the elderly policy set up a National Council, consisting of members from Non-Government Organizations (NGOs), Citizens groups, and retired professionals from law, social welfare, research, and medicine.

In 2004 the government established the National Initiative on Care for the Elderly (NICE), to increase the awareness about problems of the elderly, identify their needs, and target interventions and to improve the quality of life of the elderly[90].

In 1987 Rowe and Rahn introduced the term "Successful ageing" which has three main components,

1. Low probability of disease and disease related disability.

2. High cognitive and physical functional capacity.

3. Active engagement with the life.

This model emphasizes that if risk factors can be eliminated, then there is potential for reduction of age associated disease and for better ageing outcomes[91].

October 1 has been celebrated as International Elder's Day. October 1 2003, International Elder's Day Celebration at an old age home in India declared that there has been 285% increase in the population of the aged in the past 50 years.

Theories on Ageing

The theories on ageing are of two types: Speculated Theories and Developmental Theories.

Speculative Theories:

Mutation theory: Increasing accumulation of mutations in the DNA due to genetic damage from background radiation leads to their incapacitation and untimely death. [21] [22]

DNA Repair theory: The ability of the cells to repair UV radiation induced damage was found to be directly related to the lifespan potential of the species. (23)

Free Radical theory: This was proposed by Harman in 1956 and stated that free radicals like the highly reactive oxygen species cause oxidative changes in the collagen elastin and DNA. There is also changes in mitochondrial membrane and fibrosis of arterioles and capillaries which are secondary to vessel damage.(24)(25)

Error Catastrophe theory: According to this theory errors in the synthesis of proteins that are involved in the formation of DNA results in the accumulation of these error containing molecules further causing an error *catastrophe* that would not be viable for normal functioning and life.(26)

Cross linking theory: It says that the accumulation of post translationally altered protein hampers normal cellular function causing ageing and death.(27)(28)

Developmental Theories:

Neuro-endocrine theory: It states that neuronal loss in selective areas of the brain (locus cerulus substantia niagra) and the decreased synthesis of their associated hormones like Growth hormone (which governs protein synthesis

and cell division) are the central factors causing ageing process. Also, there is decreased steroid synthesis leading to osteoporosis.[29]

Burnet's theory: According to this the species-specific genetic constitution is responsible for the replication of its genetic matter, which further regulates the mutations thus influencing the maximum lifespan potential of the species finally.[30]

Autoimmune theory: There is appearance of increasing defects in protein synthesis with passage of time resulting in the production of new protein that body fails to recognize as self, considering it as a foreign matter and hence, produces antibodies against it, resulting in immune reactions which are the basis of ageing.[31]

Immune theory: There is diminished antibody production with age resulting in increasing vulnerability to infections.[32]

Hay Flies Theory: According to this theory the cells of the body have only limited ability to multiply and old age sets in when the cells exhaust this ability.[32]

Apoptosis: This concept also known as programmed cell death or cell suicide is a regulated event dependent on active metabolism and protein synthesis in the dying cell. Physiologically it occurs in embryogenesis and metamorphosis. It can be triggered by deprivation of growth factors, which

other than controlling entry into the cell cycle, also represses the active suicide response.(33)

Deposable soma theory: According to this theory an organism has to invest to maintain its body. The accuracy of protein synthesis and the resulting DNA regulate the life span of the organism. The maintenance of this DNA and its repair systems is very costly. The cost can be calculated in terms of the energy required in carrying out a process in the cell. The maximized maintenance that the human body can provide is much less than that required for indefinite survival. (34)

Progeria: It is a rare genetic disease characterized by features which resemble accelerated ageing.

Physiological Features of Ageing

Alterations in cardiovascular system: The number of myocytes decreases with increasing age though the cell size of the myocytes increases, which results in thickening of the left ventricular wall. There is also thickening of vessel wall resulting in increased vascular resistance further causing increased systolic pressure and increased afterload. The outcome is a hampered early diastolic filling and there is a decrease in the response of the beta-adrenergic receptors of heart and decrease in the maximum potential heart rate.

Also declining is the number of sinus node's of pacemaker cells. Exercise-induced left ventricular dilation helps the heart make up for this partly. By the

time a person is 80 years old, the left ventricle's early diastolic filling rate has dropped to half of what it was at its peak. There is concurrent reductions in vascular compliance and increase in the stiffness of the artery wall along with intimal hyperplasia and thickening.[35][36]

The two primary factors of arterial blood pressure are peripheral vascular resistance and central artery stiffness. As people age, the key factor affecting pressure is the stiffness of the central arteries. Researchers have found that whereas diastolic blood pressure peaks in the 50s and then progressively falls whereas systolic blood pressure rises in persons of all ages, far into their 80s. Thus, an increase in systolic blood pressure and a drop in diastolic blood pressure, which manifests as a wider pulse pressure, are the overall effects of ageing. Isolated systolic hypertension is the most prevalent type of hypertension in people over 50.[37]

Alterations in Pulmonary Function:

Increased chest wall rigidity and weaker respiratory muscles lead to an increase in closure capacity and a decrease in forced expiratory volume in one second (FEV1). [38]

The size of the alveolar ducts and respiratory bronchioles expands dramatically with age, especially after the age of 60. By the time an individual is 70 years old, the total surface area for gas exchange has decreased by 15% due to alveolar growth. [39] Pulmonary elastic recoil pressure is decreased as a result of ageing changes. [40] It is due to fusion of nearby alveoli thus reducing surface tension forces and hence pulmonary elastic recoil. [41]

The calcification of the intercostals, cartilages, arthritis of the post-vertebral joints, and age-related progressive atrophy of the intercostal muscles all contribute to an increase in the stiffness of the chest wall. Chest wall compliance is even more significantly reduced in patients who also have kyphosis and osteoporosis. With ageing, the diaphragm's strength also decreases. The age-related loss in pulmonary compliance and muscular strength has the biggest impact on the alterations in the pulmonary function test. As people get older, their forced vital capacity and FEV1 decrease. Age-related reductions in arterial oxygen partial pressure and expiratory flow rates have been implicated as pulmonary complications risk factors. [42]

Alteration in Renal Function:

The kidneys increase in size from 50 to 250 grammes by the time a person is 50 years old.

Due to glomerulosclerosis-related cortical tissue loss, their weight falls to about 180g. Tubular senescence is additionally observed.

These are the two main reasons why glomerular filtration rate (GFR) decreases with ageing. The GFR falls down beyond age 40, decreasing by 1 ml/min/year.

Glomerulonephritis is accelerated by conditions like atherosclerosis, hypertension, and diabetes mellitus. (43)

With ageing, the kidney's ability to secrete potassium, hydrogen, and sodium ions decreases. (44) Because the juxtaglomerular apparatus produces less rennin, there is a blunting of the response to aldosterone, which results in aberrations of the acid-base balance and an attenuated response to antidiuretic hormone making the conservation of sodium and water difficult. (45) (46) (47)

Alterations in Gastrointestinal Physiology:

These include alterations to neuromuscular activity, alterations to the gastrointestinal wall's composition, and changes to secretion and absorption.

Changes in neuromuscular function: These mostly impact the oesophagus and upper digestive tract. Particularly vulnerable to changes in neuromuscular function, the cricopharyngeus can result in issues like aspiration, dysphagia, and pharyngoesophageal diverticula. (47) (48) The lower oesophageal sphincter's

insufficient resting pressure can cause gastroesophageal reflux and symptoms that mimic hernia and achalasia. [49]

While it has been shown that small bowel transit times are unaffected by age [50], gastric emptying has been found to slow down. [51]

Alterations to the gastrointestinal wall: Atrophic gastritis has been linked to ageing and is more common. [52] The surface area of absorption decreases along with a continuous reduction in the height of tiny intestinal villi. [53] The muscularis propria at the points where arteries and veins cross the intestinal wall weakens, which results in the development of diverticular disease, the most frequent age-related colon disease. [54]

Changes in secretion and absorption: Although the mucin content of saliva has increased, overall production and flow rates are normal. [55] [56] Atrophic gastritis results in decreased intrinsic factor and acid secretion. [57] While having mild to moderate atrophic gastritis, the stomach still secretes enough intrinsic factor to block vitamin B-12 mal-absorption through the normal route. [58] Pepsin secretion declines correlate with the presence of age-related mucosal atrophy. Although this may be variable and clinically inconsequential, a decrease in the small intestine surface area causes impairment in the absorption of calcium, carbohydrates, and D-xylose. [58]

Changes in Hepato-Biliary Function: At the age of 50, the liver's size decreases from 2.5 to little over 1.5 percent of the body weight. The majority of liver

function test results and typical function test findings for hepatic filtration, detoxification, ethanol elimination, and conjugation continue to be normal. [59] Gallstone disease is more prevalent as people get older. [60] This might be brought on by a decline in the gallbladder's cholecystokinin sensitivity. [61]

Alterations in Immune, Endocrine, and Stress Responses:

Pituitary: The age-related decline in growth hormone is mediated by changes in growth hormone releasing hormone and somatostatin. [62]

Thyroid: As we age, the thyroid begins to somewhat atrophy, fibrose more, and the size of the follicles decreases. [63]

Functionally, there is a decreased absorption of iodine, a decreased peripheral conversion of thyroxine to tri-iodothyronine, and overall lower levels of thyroxine and free thyroxine. [63]

Parathyroid: When compared to younger people, older people have higher serum parathormone levels and a higher parathormone release in reaction to serum calcium. [64] This has been linked to bone loss and osteoporosis. [65] With ageing, calcitonin levels also decrease.

Pancreas: Regardless of fat or sex, there is a progressive impairment of glucose tolerance in non-diabetic people as they age. [66]

Gonads: Menopause in women is characterised by the cessation of menstruation, a decrease in oestrogen levels, and an increase in leutinizing hormone levels. [67] Skeletal mass is declining along with the usual aging-related decline in skeletal mass, which exacerbates osteoporosis and pathological fractures. The cardioprotective effects of oestrogen are lost during menopause, which raises levels of low-density lipoprotein and causes atherogenesis. [68] Serum levels of testosterone, oestradiol, and dehydroepiandrosterone sulphate in men gradually decrease as they age, but levels of sex hormone binding globulin, luteinizing hormone, and follicle stimulating hormone rise. [69] Low testosterone levels are linked to lowered haematocrit, erectile dysfunction, muscle atrophy, and osteoporosis. [66] [70]

Adrenals: There is a shift in the cortisol diurnal cycle that occurs earlier in the day and results in greater evening cortisol levels[71], which is clinically indicated by earlier bedtime and awakening than in younger people. Adrenaline and noradrenaline baseline levels rise, while stimulation-induced release of these chemicals is reduced. [65] [72]

Alterations in the Immune system

T lymphocyte-mediated immunity is compromised, and infection susceptibility is elevated. [72]

Neurological changes

In persons above the age of 80, a 6–11% reduction in brain mass has been seen[74]. Minimal neuronal loss with ageing has been shown in histological analyses of brain specimens free of dementia or other clinical characteristics. [75] However, neuronal loss is closely related to neurodegenerative diseases (such as Alzheimer's, Parkinson's, and Huntington's disease). [76]

Quantitative magnetic resonance imaging studies of the brain were conducted by Cofey et al. in subjects matched based on the results of the Mini Mental Status Examination (MMSE), and they discovered statistically significant alterations in the volume of the lateral ventricle and other cerebral regions with ageing. [77] Higher level of education is known to prevent dementia. [78] This concept is known as the reserve hypothesis. Age has been associated with a reduction in cerebral blood flow and oxygen consumption. [79] Due to vascular disease, this raises the risk of cerebrovascular accidents. [80]

Vision, auditory function and vibrotactile sensation are impaired with age. [81] In chilly conditions, thermoregulatory processes become less effective, increasing the risk of hypothermia. [82] Also, the pain threshold is higher in older people. [83]

Global Situation

One of the most significant developments of the 20th century was the increase in life expectancy at birth. However, instead of celebrating the positive demographic trend, the world is experiencing an "age quake" because the percentage of persons aged 60 and older is growing and is anticipated to quicken over the following 50 years. In Western countries, this "demographic time bomb" is on the verge of detonating, and Asia, especially India, is not far behind.

The older population is concentrated in the developing world and is expanding considerably more quickly than in developed countries, despite the fact that affluent countries have a comparatively high share of the aged. The geriatric population's two thirds are present in developing countries. [92]

The elderly population has been growing rapidly as successively larger cohorts enter old age as a result of the late 20th century's high fertility and lowering death rates.

The population of the world in 1995 was 5.7 billion. The number will rise to reach 10.8 billion by 2050. Between 1995 and 2000, it has been estimated that 81 billion people were added to the world population each year[93].

The ratio of older persons has changed dramatically from approximately one in fourteen in the fifties to about one in four at present. From 1990 to 2025, the

elderly population in Asia will rise from 50% of world's elderly to 58%, in Africa and Latin America from 5% to 7%, but in Europe the figure will drop from 19% to 12% of world's elderly.[94]

INDIAN SITUATION[95]

Although percentage of aged persons to total population is low in comparison to developed countries, but absolute size of aged population is considerable.

The proportion of elderly aged 60 years is increasing according to the decennial censuses and it is shown below,

1961:- 24.71 million

1981:- 43.17 million

1991:- 56.68 million

2001:- 70.78 million (7.1)

2011:- 96.30 million (8.2)

2021:- 138 million (9.9)

2031:- 178.59 million (11.9)

2041:- 236 million (14.5)

2051:- 300.96 million[95] (17.3)

The proportion of elders to its total population is 11.2% in Kerala and it is the highest in the country. The states where proportion is higher than 8% are Goa, Pondicherry, Himachal Pradesh, Tamil Nadu, and Orissa. The states where ageing is slow are Chandigarh, Nagaland, Assam, Meghalaya, and Delhi.

National sample survey, 60th round conducted during 2004 focused on "morbidity and health care" with a separate special section focused on the problems of aged. This data set provides ample information to study the problem of the elderly. This survey covered all the regions of India, with the exception of some interior areas of Nagaland, Andaman, and Nicobar Islands, Ladakh (Leh) and Kargil districts of Jammu and Kashmir[96].

This survey collected information on demographic characteristics, dependency ratio, conditions of the aged in respect of their economic dependency, living arrangements, persons supporting the aged, etc.

SITUATION IN KARNATAKA

Rural Karnataka: Geriatric population aged 60 yrs and above is 6.9% consisting males 7.1% and females 6.6%.

Sex Ratio: 963 females to 1000 males.

Urban Karnataka: 5.9% consisting, males 5.8% and females 6.1%.

Sex Ratio: 1064 females to 1000 males[97].

National Programme for the Health Care for the Elderly[98]

The National Programme for the Health Care of the Elderly (NPHCE) is an articulation of the Government's international as well as national commitments as envisaged by the UN Convention on the Rights of Persons with Disabilities (UNCRPD), the Government of India's National Policy on Older Persons (NPOP) adopted in 1999, and Section 20 of "The Maintenance and Welfare of Parents and Senior Citizens Act, 2007" dealing with the provisions for medical care of Senior Citizens. [98]

Vision

- To provide accessible, affordable, as well as high-quality long-term, comprehensive and dedicated care services to the elderly population;
- Creating new "architecture" for Ageing;
- To build a framework so as to create an enabling environment for ***"a Society for all Ages";***
- To promote the concept of Active and Healthy Ageing; [98]

Objectives of the Programme

- To provide easy access to not only promotional, preventive and curative but also rehabilitative services to the elderly through community based primary health care approach
- To identify the health problems in the aged and provide appropriate health interventions in the community with a good referral backup support.
- To build capacity of not only the medical and paramedical professionals, but also the care-takers within the family for providing health care to the elderly.
- To provide referral services to the aged patients through district hospitals and regional medical institutions

- Convergence with the National Rural Health Mission, AYUSH and other line departments like Ministry of Social Justice and Empowerment. (98)

Strategies of the programme

-A community-based primary health care approach that includes home visits by qualified health workers.

-PHC/CHC-specific services, such as the provision of machinery, equipment, training, additional human resources (CHC), IEC, and so on.

-Dedicated District Hospital facilities with ten-bed wards, additional human resources, machinery and equipment, consumables and medications, training, and IEC.

-Strengthening of 8 Regional Medical Institutes to provide dedicated tertiary level medical facilities for the elderly, introduction of PG courses in Geriatric Medicine, and in-service training of all levels of health staff

-Information, Education, and Communication (IEC) reach out to the target group through mass media, folk media, and other communication channels.

-Continuous monitoring and independent evaluation of the Program, as well as Geriatric research and NPHCE implementation. (98)

Expected Outcome of the Programme

- Regional Geriatric Centres (RGC) in 8 Regional Medical Institutions by establishing Regional Geriatric Centres with a dedicated Geriatric OPD and 30-bed Geriatric ward for management of specific diseases of the elderly, training of health personnel in geriatric health care, and research;

- Post-graduates in Geriatric Medicine (16) from the 8 Regional Medical Institutions;

- Video Conferencing Units in the 8 Regional Medical Institutions to be used for capacity building.

- District Geriatric Units with dedicated Geriatric OPD and 10-bed Geriatric ward in 80-100 District Hospitals;
- Geriatric Clinics/Rehabilitation units established for domiciliary visits in Community/Primary Health Centres in selected districts;

- Sub-centres equipped for community outreach services;

- Training of Human Resources in the Public Health Care System in Geriatric Care. [98]

Schemes for the Benefit of the Elderly in India

The government of India has launched various schemes for the senior citizens to protect their rights and maintain their good health.

Some of the government schemes for senior citizens in India are –

1. Pradhan Mantri Vaya Vandana Scheme

This is one of India's most popular senior citizen pension systems. This Prime Minister Elderly Citizen Scheme is designed for senior citizens over the age of 60, and the policy period is ten years. The pensioner has the option of receiving payments monthly, quarterly, semi-annually, or annually. This strategy allows you to earn 8% interest every year. The lowest and maximum pension caps are Rs. 3,000 and 10,000 per month, respectively. [99]

2. Indira Gandhi National Old Age Pension Scheme (IGNOAPS)

Specially designed for elderly persons over the age of 60 who fall below the poverty level, according to the Government of India's criteria. The IGNOAPS provides financial assistance of up to Rs. 200 per month for adults between the ages of 60 and 79, and Rs. 500 per month for people above the age of 80. [100]

3. National Programme for the Health Care of Elderly (NPHCE)

This system, which was implemented in 2010, focuses on both preventive and promotional treatment in order to maintain general health. This programme was created to address the health challenges that elders experience. Through the State Health Society, district-level objectives include providing dedicated health facilities in district hospitals, community health centres (CHC), primary health centres (PHC), and sub-centres (SC). These services may be provided for free or at a significant discount. [101]

4. Varishta Mediclaim Policy

This coverage assists elders by paying the costs of medications, blood, ambulance services, and other diagnosis-related expenses. This programme assists senior individuals between the ages of 60 and 80 in meeting their health-related expenses. Furthermore, income tax benefits are available for premium payments under Section 80D. Although the policy length is one year, you can renew it until you reach the age of 90. [(102)]

5. Rashtriya Vayoshri Yojana

This programme gives physical aids and assisted-living gadgets to older persons over the age of 60 who are BPL (below the poverty line). If senior persons want to take advantage of this, they must obtain a BPL card. This is a Central Sector Scheme, and the Central Government is fully funding it. [(103)]

6. Varishta Pension Bima Yojana

The Ministry of Finance launched this pension scheme for senior citizens over the age of 60. This scheme is run by the Life Insurance Corporation of India. This policy does not necessitate any medical examinations. It provides secure pension with a guaranteed interest rate of 8% per annum for up to 10 years - you may choose between monthly, quarterly, half-yearly, and annual pensions depending on how the elderly want to receive it. [(104)]

7. Pradhan Mantri Jan Arogya Yojana

The Ministry of Health and Family Welfare introduced this scheme in 2018 with the goal of covering up to 10 crore people from poor and vulnerable families. This scheme provides coverage for secondary and tertiary hospitalisation of up to Rs. 5 lakhs per family. **(105)**

8. Senior Citizens' Welfare Fund

This fund, established by the Ministry of Social Justice and Empowerment, includes unclaimed funds from modest savings and savings accounts in Central Government schemes. It strives to provide seniors with financial stability for their entire well-being and health care.

9. Vayoshreshtha Samman

This programme focuses on seniors who have made major achievements in their fields and honours their efforts. It was elevated to the National Award in 2013, and since then, prizes have been given in thirteen different categories. (106)

10. Reverse Mortgage Scheme

The Ministry of Finance introduced this scheme in 2007 to help senior folks. They can mortgage their residential property against a loan of 60% of the house's worth for a minimum of 10 years.

Related Studies:

1) In a cross-sectional study done in northern India by Vandana Verma et al in 2019 on multi-morbidity among a geriatric group found that 31.8% elderly were suffering from two morbidities, 15.5% were suffering from three chronic conditions and 4.6% were suffering from four chronic conditions. The most common diseases found were anemia in 37.5%, hypertension in 41.75%, and arthritis in 61%. Anemia and arthritis were common in females, and COPD & Genitourinary were common in males. It was concluded that prevention programs and strategies should be more focused on screening the elderly especially females. **(107)**

2) In a study by Dr. Kriti et. al. on psychosocial factors influencing rural geriatric women in north Karnataka in 2019, it was found that out of 200 women aged 60 years and above 96.4% were illiterates and 47.3% were widows. 7.3% of them were living alone while 13.3% were found using tobacco. 74.5% of the women said that they were well looked after and 69.1% shared work responsibilities with their families. 26.1% of them felt that there was maladjustment in their families. 83.6% were financially dependent on others. Among the morbidities arthritis was found to be 73.3%, visual problems were 58.8%, and dental problems were 50.3%. (108)

3) Gajendra Kumar Medhi et al (2019) in a study of the health-related quality of life in elderly individuals in an urban locality in India, measured 8 domains of health-related quality of life. Males had significantly higher HRQOL scores than females. Age gradients were observed for HRQOL scores with the youngest group having the best scores while the older group had the poorest. Age gradients were observed for HRQOL scores with the youngest group having the best scores while the older group had the poorest. Financially independent had better HRQOL scores than those who were financially dependent. Education and marital status were also found to be significantly associated with HRQOL scores. (109)

4) Kavita Banker et al(2018)in a study on the Health Profile of the Elderly Persons in Urban and Rural Field Practice Areas of Medical College in Himmatnagar, Gujarat found that 17.2% of the elderly in urban and 32.6% in rural had restricted mobility. 11.3% in rural and 4.6% in urban were using walking sticks. The most common physical complaint observed was body ache in 45.2% rural and 43.4% of urban elderly, joint pain was found in 26.3% and 33.7% in rural & urban

elderly, vision impairment in 23.1% rural and 27.4% of urban and hearing problems were observed in 20.6% rural and 16% of urban elderly. (110)

5) V R Zare et al in 2018 in a study on the health status of the elderly in Hyderabad, Smoking & Alcohol was found to be more common in rural than urban areas. Hypertension, ear disease, skin diseases, musculoskeletal disorders, psychological disorders, cancer, and neurological diseases were more common in rural elderly than urban elderly and gynecological disorders were found to be more among the urban population. (111)

6) A study on the mental health needs of the elderly in Kerala by Pankajakshan Vijayanthi et al in 2018 found that depression, anxiety, insomnia, somatization, and dementia were the common mental health problems in the elderly. Loneliness, isolation, neglect, and elder abuse were common psychosocial issues, and also poor family support services were found. (112)

7) In a study on the elderly population by Kabita Barua et al (2017) in urban slums of Assam found arthritis to be most common in 70.4% followed by visual impairment in 58% of the elderly. 81.2% of the elderly were unable to get proper treatment because of a lack of money. (15)

8) Abhishek Mishra in 2017 in a study on the health profile of the elderly in urban slums of Cuttack city, Odisha. found that anxiety, loneliness, and fatigue were the most common psychological problems. Hypertension was the most common health problem in the age group of 60 – 64 years (57%) & >75 years (77.6%) elderly, diabetes in 48%, STD in 7%. In the age group, 65-74 years vision impairment was most common in 63.5%, STD was least common in 5.8%. Malnutrition was found in 67.1% of > 75 years elderly. Less physical activity and a sedentary lifestyle is common in 60-74-year-old. Tobacco and alcohol are found among the 65-74-year-old age group. The study concluded that the elderly especially above 75 need special attention because they suffer from psychological problems. Family support, economic support, and dependency also are factors that affect the elderly. [113]

9) Shahul Hameed and Nanjesh Kumar et al in 2015 found that among the study population which was having mean ager 66.9 years only 3.7% of people were not suffering from any morbidity. The majority of them i.e. 25.3% were suffering from 3 morbidities, and 12.5% had 5 or more morbidities. The major morbidities found out were impaired vision, followed by hypertension and joint pain. The proportion of arthritis, anemia, and obesity was higher in females. [7]

10) Vani Madhavi t al in 2015 did a cross-sectional study on the health status of the rural elderly in east Godavari district of Andhra Pradesh.100 subjects of age more than 60 years were studied based on age, educational status, marital status, economic dependencies, health status and common disabilities. In results, it was found that in the study population 58% were illiterate, 25% were widowed, 62% were economically fully dependent on their children and 42% of participants had poor health status. (5)

11) Shraddha K et al in 2012 did a study on morbidity patterns among the elderly in the urban population of Mysore, Karnataka. A cross-sectional study based on the community was carried out in the urban health center of JSS Medical College, Mysore. A cross-sectional study based on the community was carried out in the urban health center of JSS Medical College, Mysore. There were 526 study subjects all above the age of 60 years. In the results, most of the systemic disorders were found to be equally distributed among both males and females. Disorders of the oral cavity were found to be more among aged males (40.6%) while disorders of skin were found to be more amongst females (10%). Most common were disorders of the eye (51.7%) followed by endocrinal, nutritional, and metabolic disorders (38.4%). It was concluded that geriatric units with specialized professionals were essential. (114)

12) In a study by Kajal Srivastava et al on the morbidity profile of the elderly in Agra in 2010 found that anemia was present in 26.2%, cataract in 24.4%%, and hypertension in 22.2% of the elderly. System wise problems of the musculoskeletal system were in 37.2%, and problems of the nervous system were in 1.8%. It was concluded that strategies are needed to improve the quality of life in the elderly with special OPD services to fulfil the needs of the elderly. [13]

MATERIAL AND METHODS

Study Area: The study was conducted at rural and urban field practice areas of Department of Community Medicine of Shri B.M. Patil Medical College, Hospital and Research Centre, Vijayapura.

Study population: The people aged 60 years and above.

Study Design: Cross-Sectional Study

Study Period: 1.5 years (January 2021-June 2022)

Study technique: Interview technique

Sample Size

With Anticipated Proportion of diabetes among the elderly population in the rural and urban area 7.6% and 27.9% [17] respectively, the study required a sample size of 137 per group. (i.e. a total sample size of 274, assuming equal group sizes), to achieve a power of 99% for detecting a difference in proportions between two groups at a two-sided p-value of 0.05.

Formula used

- $\mathbf{n= \frac{(z_\alpha+z_\beta)^2\ 2\ p*q}{MD^2}}$

Where,

Z= Z statistic at a level of significance

MD= Anticipated difference between two proportions

P=Common Proportion

q= 100-p

With a non-response rate of 20% the sample size =274+54=318 which was rounded to 350.

Inclusion Criteria

1.All the people aged 60 years and above in urban and rural field practice area, and those who were willing to participate in the study were included.

Exclusion Criteria

1. People who were not willing to participate in the study.

2. People who were unable to respond.

Methodology

Ethical clearance from the Institutional Ethical Committee was obtained after which the study was conducted in rural and urban field practice area of Shri B. M. Patil Medical College, Hospital and Research centre. With the help of medico social workers of RHTC and UHTC, the data was collected after the objectives were explained to them.

The purpose and overview of the study was explained at the time of the interview, and participants were informed that their participation was entirely voluntary, their anonymity would be assured, they could withdraw from the study at any time and the information that they will be providing would be used only for the purpose of the study. Confidentiality about data and findings were assured to the participants and their consent was taken.

The present study was conducted in urban and rural field practice areas of Shri B.M. Patil Medical College, Hospital and Research Centre.

The study was done from January 2021 to June 2022 among the participants residing in study area.

A sample size of 175 for each group in the total 350 study participants were chosen from as many houses. In order to balance the selection of houses among the areas 50% were targeted from rural area and 50% from urban area. A preliminary house to house survey was done to know the number of persons aged 60 years and above. After enumerating them by using systematically random sampling technique every alternate person aged 60 years and above were included in the study till the required sample is met. In case the house was locked or members were non-consenting, adjacent houses were selected. Same procedure was used in both urban and rural field practice area. The participants were interviewed using pretested and semi-structured questionnaire.

Method of Data Collection

1. Pilot Study: A pilot study on 15 elderly subjects in the age group 60 years was conducted in both urban and rural areas and they were also included in the study.

With minor changes in the initial questionnaire, a final proforma was designed and the study was continued. The proforma is given as annexures.

2. Collection of data: House to house visit was done in the selected areas and the interview was conducted in local language, (kannada) with the help of medico social workers of health centres, at each eligible participant's residence with minimal distractions and discomfort and assuring convenience and comfort of the participants.

Information regarding Socio-demographic profile, Mental Health status, Quality of Life, Daily Activity Status and any existing morbidities. General physical examination, systemic examinations, and anthropometric measurement like: Height, Weight, BMI, using standard operating procedures were performed. Vitals included Pulse rate, Blood pressure, and Respiratory rate.

Investigations:

Random blood sugar by glucometer (Brand- Gluco one),

Hemoglobin by automated hemoglobin meter (Brand-Acon Mission Hb testing System)

Measurement of height:

For the measurement of height, study subjects were made to remove the footwear and stand with heels together and toes apart and head positioned against the wall so that the line of vision was perpendicular to the body (Frankfurt line). The arms were hung freely by the sides, with the head, back, buttock and heels in contact with the wall. A wooden scale was brought down to the topmost point on the head and marking was made on the wall. Measurement was taken using measuring tape in centimetres (cm). Height was recorded to nearest 0.5 cm. [115]

Measurement of weight:

The weight was measured in kilograms (kg) using standardized digital weighing machine with the study subject standing erect on center of platform, with the body weight evenly distributed between both the feet together and toes apart without footwear with accepted clothing and looking straight ahead. The weight was recorded to nearest 0.5 kg. [115]

Body Mass Index (BMI)

Quetlet Index classification proposed by the WHO Western Pacific Regional Office in collaboration with IOTF (International Obesity Task Force) steering committee (2000) for Asian people was used. Quetlet Index/BMI=Weight (in kg) / Height (in meter)^2.[115]

Table 1: Classification of BMI

Classification	**BMI**
Underweight	<18.50
Normal range	18.50-24.99
Overweight	≥25.00

Random blood sugar by glucometer:

The glucometer was first turned on by inserting a test strip. The glucometer screen signalled when it was time to put blood on the strip; after which the lancing device was used to pierce the side of the participants finger, next to the fingernail. Finger of the participant was squeezed until a sufficient-size drop was formed. Then this drop of blood was placed on the strip. Next the participant's finger was blotted with the alcohol prep pad to stop the bleeding. After a few moments, the glucometer generated the reading. According to WHO, random blood sugar level cut off value of 200mg/dl and above is considered diagnostic of diabetes mellitus .[116]

Measurement of haemoglobin by automated haemoglobinometer:

The haemoglobinometer was turned on by holding the power button for 3 seconds. Then a fresh strip was inserted into the meter and a drop of blood sign was displayed on the screen. The tip of the finger of the participant was pricked with lancet, after which the first two drops of blood was wiped off and the third

drop was placed on the strip following which the results were displayed in a minute.[117] Then the reading was classified according to WHO haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. [118] [119]

Table 2: Classification of Anaemia according to Hb values

Severity	**Haemoglobin values**	
	Males	Females
Normal	13-16 g/dl	12.0-16.0 g/dl
Mild	11-12.9 g/dl	11-11.9 g/dl
Moderate	8-10.9 g/dl	8.0-10.9 g/dl
Severe	<8 g/dl	<8 g/dl

Measurement of blood pressure by Sphygmo-manometer:

The participant is asked to loosen any tight clothing or remove long sleeved garments so that it is possible to access the upper arm. The arm that may have a medical problem is not used. Then, the rest of the participant's arm is secured on a surface that is level with their arm. The stethoscope is then placed over the brachial artery in the bend of the elbow and the pulse is heard. The cuff is pumped slowly and it is noted when the pulse disappears. This is an indication to stop inflating the cuff. The cuff is deflated very slowly whilst the mercury level in the sphygmomanometer is watched.

The sphygmomanometer reading is noted, when the pulse reappears and this is recorded as the systolic pressure. The cuff is deflated further until the pulse disappears; this reading is recorded as the diastolic pressure. And then, it is classified according to WHO.[120]

Table 3: Classification of Blood Pressure

Category	**Systolic (mm of Hg)**	**Diastolic (mm of Hg)**
Normal	<120	<80
High normal	120-129	80-84
Grade 1 Hypertension	140-159	90-99
Grade 2 Hypertension	160-179	100-109
Grade 3 Hypertension	>/=180	>110

Statistical Analysis

- The data obtained was entered in a Microsoft Excel and statistical analysis was performed by using statistical package for the social sciences (Version 20).
- Results are presented as Mean±SD, counts and percentages, and diagrams.
- For normally distributed continuous variables between two groups comparison has been done by using Independent t-test; for abnormally distributed variables Mann Whitney U test has been used. Categorical variables between two groups have been compared using Chi-square test.
- $p<0.05$ has been considered statistically significant. All statistical tests have been performed two-tailed.

Data Collection Tools

The Questionnaire included questions pertaining to the following categories:

1. Questionnaire regarding Sociodemographic profile of the elderly-

    i) Personal Information like Name, age, gender, marital status, residence, type of family, occupation, income, SES, education.

    ii) Personal History- Habits

    iii) Family History

    iv) Diet History

2. Hamilton Depression Rating Scale
3. WHO Quality of Life Questionnaire regarding the quality of life of the elderly.
4. Questionnaire regarding morbidity pattern of the elderly i.e. Present morbidities and/or any past morbidity or any acute illness during the last one month.
5. General Physical Examination, Vitals, Systemic Examination and Investigations.
6. Katz Activity of Daily Living Questionnaire.

Hamilton Depression Rating Scale:

It was written in the late 1950s by Max Hamilton, a psychiatrist at Leeds University.

The most commonly used instrument for assessing symptoms of depression. It has been used in many key studies of depression and its treatment. The instrument is designed to be administered after a structured or unstructured interview of the patient to determine their symptoms. [121]

Administration

The scale is widely available and has 17 questions. The questions are scored between 0 and 4 points. The 17 questions measure the severity of depressive symptoms and the interviewer rates the level of agitation clinically noted during the interview or how the mood is impacting on an individual's work or leisure pursuits based on a scale between 0 to 4. [121]

Scoring and Interpretation[121]

A total score is calculated by summing the individual scores from each question.

- Scores below 7 generally represent the absence or remission of depression.
- Scores between 7-17 represent mild depression
- Scores between 18-24 represent moderate depression
- Scores 25 and above represent severe depression.

WHOQOL BREF Instrument[122]:

The WHOQOL BREF was constructed by 1995. It contains total of 24 questions. It consists of four domains namely – physical, psychological, social and environmental. Each domain consists of 7, 6, 3 and 8 questions respectively.

The instrument places primary importance on the perception of the individual and provides a new prospective on the disease by focusing on the individual‘s own view of their well-being.

The facets incorporated within the domain are:

Physical Health: Energy and fatigue, pain and discomfort, sleep and rest.

Psychological: Bodily image and appearance, negative feelings, positive feelings, self esteem, thinking, learning, memory and concentration.

Social Relationship: Personal relationship, social support and sexual activity.

Environment: Financial resources, freedom, physical safety and security, health and social care, accessibility and quality, home, environment, opportunities for acquiring new information and skill, participation in and opportunities for reactional/leisure, physical environment (population/noise/traffic/climate), transport.

The domain scores are scaled in positive direction, where higher scores denote higher quality of life. The WHOQOL BREF is easy to administer and has been validated. [122]

Method of Manual Calculation:

Physical domain: [(6-Q1)+(6-Q2)+Q8+Q13+Q14+Q15+Q16]*4

Psychosocial domain: [(Q3+ Q4+Q5+Q9+Q17+(6-Q24)]*4

Social domain: [Q18+Q19+Q20]*4

Environmental domain: [Q6+Q7+Q10+Q11+Q12+Q21+Q22+Q23]*4

Where more than 20% data were missing, the assessment was discarded. Where up to 2 items were missing from domain was not calculated. [122]

Scoring and Scale

The four raw domain scores are converted to the transformed scores (0-100 range) as per WHO BREF instructions and scoring(156). The overall score thus got, can be categorised as-

Poor Qol: <45

Fair Qol: 45-66

Good Qol: 67-87

Excellent Qol: 88-100

Katz Activities of Daily Living Scale[123]

It is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform activities of daily living independently. It is typically used to detect problems in performing activities of daily living and to plan care accordingly.

Importance

Normal ageing changes and health concerns commonly manifest as reductions in older persons' functional status. Decline may set the older adult on a path of iatrogenesis, leading to more health issues. Functional assessment, which gives objective data that may suggest future decline or improvement in health, is one of the finest techniques to evaluate the health condition of older persons.

Administration

This scale ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions.

Scoring

A total score of 6 indicates full function, 4 indicates moderate impairment, and 2 or less indicates severe functional impairment. [123]

Criteria for Diagnosis:

Hypertension: Hypertension was diagnosed when the average of two readings of blood pressure showed systolic greater than or equal to 140 millimetres of mercury and diastolic greater than or equal to 90 millimetres of mercury; the two readings were taken 10 minutes apart (when the first reading was found to be >=140/90 mm Hg).

Respiratory Disease: Chronic bronchitis, asthma, tuberculosis and other respiratory conditions as diagnosed by clinicians earlier.

Musculoskeletal Disease: Kyphosis, scoliosis, arthritis and spondylitis as diagnosed earlier or at clinical examination and musculoskeletal pain.

Nervous System Disorders: These comprised of stroke, epilepsy, tremors, anxiety, dementia and depression, either already diagnosed or currently found to be present on clinical examination.

Eye disease: Eye disease or diminished vision and cataract were considered to be present with prior diagnosis or diagnosis at clinical examination by asking the subject to count fingers at various standard-distances, and clinical detection of cataract.

Hearing Impairment: Hearing impairment was diagnosed to be present if either diagnosed earlier or at clinical examination indicated by an inability to repeat sentences whispered in the ear.

Study variables:

Age: Age was recorded in completed years as revealed by the subjects which was verified through any Id card (Aadhar, voter Id, etc.) of that participant.

Marital status[124]: Marital status of the person was recorded under the following headings.

1. Married: Person currently married, whether for the first time or another time and whose marriage is subsisting at the time of study in concordance with valid regulations.

2. Widowed: Person whose partner has been died and he/she has not married thereafter during the time of the study.

3. Separated: People whose marriage was terminated.

Type of family[124]:

1. Nuclear family: It consists of a married couple and their children while they are still regarded as dependents.

2. Joint family: It consists of number of married couple and their children living together in the same household. All men are related by blood and women of household are their wives, unmarried sisters and their family kinsmen.

3. Single: A person staying alone.

Education[124]:

1. Illiterate : Not able to read, write and understand in any language

2. Primary school: Studied up to 7th standard

3. High school (Secondary): Studied up to 8th standard to SSLC

4. PUC/Diploma : Studied up to PUC or any diploma

5. Graduate and above: Studied up to graduation and above

Occupation[125]:

- Housewife: involved only in household chores.
- Unemployed: people who are not employed
- Unskilled: Watchman, Peon, Domestic servant etc.
- Semi-skilled: Worker in factory/workshop, labourer, shopkeeper etc.
- Retired: Participants who have retired from their respective occupations on reaching the age of 60 years.
- Professional: teachers, doctors (working in private) .

Socio-Economic status[126]:

-Self- reported per capita monthly income was recorded.

Modified BG Prasad's classification was used to assess the social class of the study subjects.

Multiplication factor = Current Index value (118.2)/Base Index value (100)

=118.2/100 =1.182

New income value =Multiplication Factor X Old income value X 4.63 X 4.93 X 2.88.

Table 4: Modified B.G. Prasad Socioeconomic Classification[126]

Social class	Original classification of per capita income (Rs/month)	Revised classification for 2021 (Rs/month)
I (Upper class)	100 and above	7770 and above
II (Upper middle class)	50-99	33808-7769
III (Middle class)	30-49	2253 – 3808
IV (Lower middle class)	15-29	1166-2253
V(Lower class)	<15	<1166

Habits:

Tobacco consumption: Yes/No

- Yes: Person who at the time of the data collection smokes/uses tobacco in any form either daily or occasionally for the past one year. (Smoke form – cigarettes, bidis etc. Smokeless form – plug, loose leaf, chemo, tambaku, gutkha etc)
- No: Person who at the time of the data collection does not smoke or use tobacco in any form either daily or occasionally for the past one year.

Alcohol consumption: Yes/No

- ❖ Yes: Person who at the time of the data collection drink any alcohol daily or occasionally for the past one year.
- ❖ No: Person who at the time of the data collection does not drink any alcohol daily or occasionally for the past one year.

Sleep:

Normal sleep of 7-8 hours per night.[155] The sleep quality was assessed by asking the participants their sleep hours at night (minimum 7 hours), ability to fall asleep easily, not waking up in the middle of sleep, and feeling refreshed when awake in the morning.

Family history of Hypertension-

If the study participant gave history of HTN in his / her blood relatives, which includes first degree relatives such as father, mother, brother or sister.

Family history of diabetes mellitus-

If the study participant gave history of DM in his / her blood relatives, which includes first degree relatives such as father, mother, brother or sister.

Eating Habits:

- Vegetarians: if the study participants gave history of consumption of foods that come from plants, like grains, fruits, vegetables, and nuts they were included as vegetarians.
- Mixed: if the study participants gave history of consumption of any animal origin foods, they were included under mixed diet.

Results

Socio demographic profile of the study participants-

Table 5: Distribution of Age and Gender of the study population

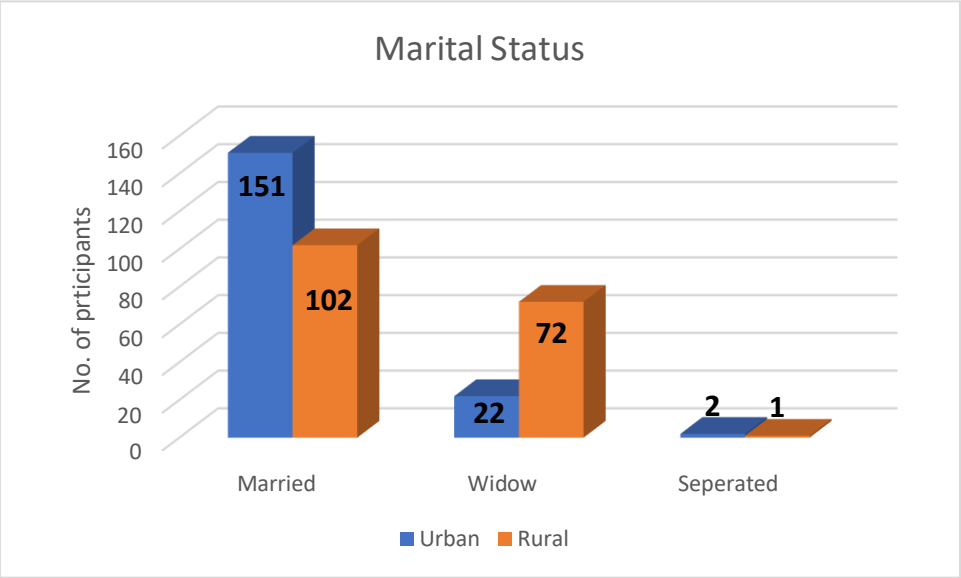
	Urban			Rural			Pearson Chi-Square	P-Value
Age Group	Males N(%)	Females N(%)	Total N(%)	Males N(%)	Females N(%)	Total N(%)	0.623	0.732
60-69	70 (60.3%)	33 (55.9%)	103 (58.9%)	55 (55%)	42 (56%)	97 (55.4%)		
70-79	34 (29.3%)	19 (32.2%)	53 (30.3%)	31 (31%)	30 (40%)	61 (34.9%)		
80+	12 (10.4%)	7 (11.9%)	19 (10.9%)	14 (14%)	3 (4%)	17 (9.7%)		
Total	116 (100%)	59 (100%)	175 (100%)	100 (100%)	75 (100%)	175 (100%)		

Among the 350 study population, majority (57.1%) were in the age group of 60-69 years, followed by 32.6% and 10.3% of the elderly belonging to the age groups of 70-79 years and more than or equal to 80 years respectively.

Out of the 175 urban study participants, 66% were males and 34% were females. Out of the 175 rural study participants, 57% were males while 43% were females.

There was no statistical significance in the age of the participants between the urban and rural areas (P=0.732).

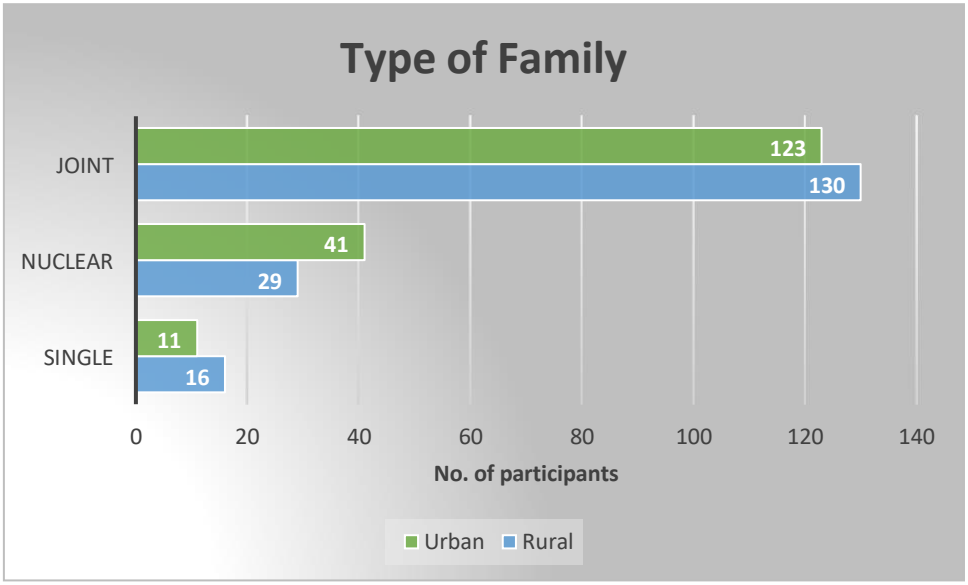
Figure 1: Marital Status of the study population



Out of the 175 study population in urban area, 151(86.2%) were married while 22(12.6%) were widow and 2(1.2%) were separated.

Among the 175 rural study population, 102(58.3%) were married while 72(41.2%) were widow and 1(0.6%) was separated.

Figure 2: Type of family in study participants



Among the 350 study participants, 253(72.3%) were from joint families, while 70(20%) belonged to nuclear families and 27(7.7%) participants were single. Among the 253 joint families, 123 were from urban area while 130 were from rural area.

Table 6: Level of Education among study participants

Education Status	Urban			Rural			Pearson Chi-Square	P-Value
	Males N(%)	Females N(%)	Total N(%)	Males N(%)	Females N(%)	Total N(%)	82.6064	0.00001*
Illiterates	10 (8.6%)	22 (37.3%)	32 (18.3%)	56 (56%)	60 (80%)	116 (66.3%)		
Literates								
Primary	59 (50.9%)	21 (35.6%)	80 (45.7%)	20 (20%)	9 (12%)	29 (16.6%)		
Secondary	26 (22.4%)	6 (10.2%)	32 (18.3%)	15 (15%)	6 (8%)	21 (12%)		
College	10 (8.6%)	8 (13.6%)	18 (10.3%)	2 (2%)	0	2 (1.1%)		
Graduate and above	11 (9.5%)	2 (3.4%)	13 (7.4%)	7 (7%)	0	7 (4%)		
*Statistically Significant (Chi-Square Test applied)								

Among the 350 study participants 148(42.3%) were illiterates, most of whom (78.4%) belonged to rural area while 21.6% were from urban area.

Amongst the 202 literates, 70.8% were from urban area while 29.2% were from rural area.

In the urban area out of the 32 illiterates, 31.3% were males while 68.8% were females. 18 participants in the urban area were educated upto the PUC level among whom 55.6% were males while 44.4% were females. 11 males and 2 females had achieved graduate level and above education.

In the rural area out of the 116 illiterates, 48.3% were males while 51.7% were females. Out of the literates 2 males were educated upto the PUC level while 7 males had achieved graduate level and above education.

The difference in literacy was found to be statistically significant among the urban and rural elderly (P=0.00001).

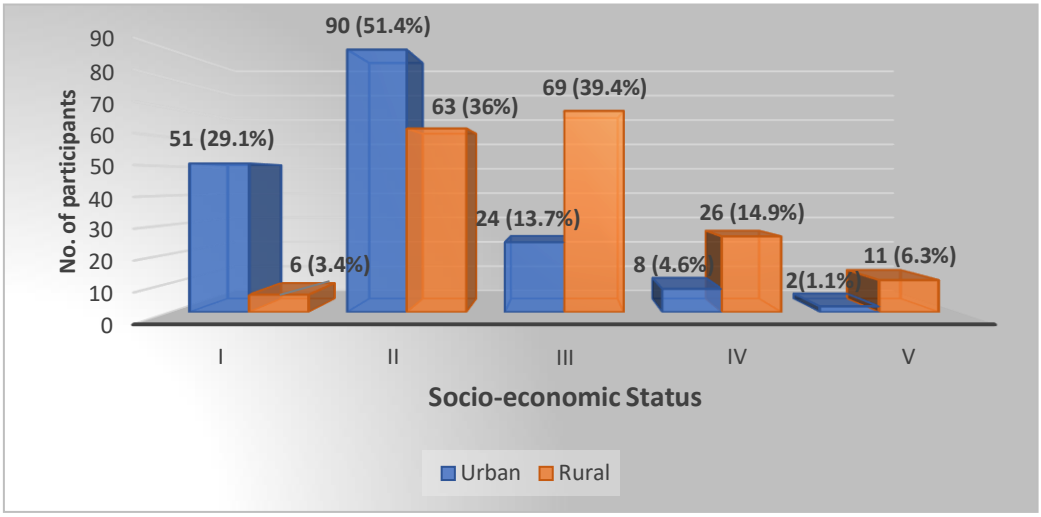
Table 7: Distribution of the elderly by occupation

Occupation	Urban			Rural		
	Males N(%)	Females N(%)	Total N(%)	Males N(%)	Females N(%)	Total N(%)
Business	19(16.4%)	0	19(10.9%)	4(4%)	0	4(2.3%)
Cook	2(1.7%)	0	2(1.1%)	0	0	0
Doctor(pvt)	1(0.9%)	0	1(0.6%)	1(1%)	0	1(0.6%)
Driver	1(0.9%)	0	1(0.6%)	2(2%)	0	2(1.1%)
Electrician	3(2.3%)	0	3(1.7%)	0	0	0
Maid	0	1(1.7%)	1(0.6%)	0	1(1.3%)	1(0.6%)
Peon	1(0.9%)	0	1(0.6%)	0	0	0
Priest	1(0.9%)	0	1(0.6%)	0	0	0
Tailor	5(4.3%)	0	5(2.9%)	0	0	0
Teacher(pvt)	3(2.3%)	0	3(1.7%)	0	0	0
Vendor	8(6.9%)	3(5%)	11(6.3%)	0	0	0
Retired	66(56.9%)	2(3.4%)	68(38.9%)	13(13%)	0	13(7.4%)
Agriculture	0	0	0	61(61%)	1(1.3%)	62(35.4%)
Housewife	0	53(89.8%)	53(30.3%)	0	56(74.7%)	56(32%)
Daily worker	6(5.2%)	0	6(3.4%)	19(19%)	17(22.7%)	36(20.6%)
Total	116(100%)	59(100%)	175(100%)	100(100%)	75(100%)	175(100%)

Out of the 175 urban study population, 38.9% were retired at the time of this study, among whom 97.1% were males while 2.9% were females. Among the urban elderly males,16.4% were involved in business of some kind, 6.9% were vendors and 5.2% were daily wage workers. One of the elderly males was a private practising doctor while 3 of them were private teachers. Out of the 59 elderly females of the urban study population, 89.8% were housewives while 5.1% were vendors and one of them worked as a maid.

Among the 175 rural study population, majority (35.4%) were involved in agriculture and 20.6% were daily wage workers of different kinds like labourer or coolie. Among the rural elderly males, 61% were farmers, 19% were daily wage workers and 13% had stopped working. One of the elderly males was a private doctor while 4% of them were involved in business of some kind and 3% of them were working as electricians. Out of the 75 elderly females of the rural study population, 74.7% were housewives while 22.7% of them were daily wage workers. One of them was a maid and another worked as a farmer.

Figure 3: Distribution of study population by socio economic status



Modified B.G. Prasad Classification (2022)

Table 8: Distribution of study population by socio economic status

Socio-economic Status	Urban N(%)	Rural N(%)	Total N(%)	Pearson Chi-Square	P-Value
Class I	51 (29.1%)	6 (3.4%)	57 (16.3%)	77.8254	0.00001*
Class II	90 (51.4%)	63 (36%)	153 (43.7%)		
Class III	24 (13.7%)	69 (39.4%)	93 (26.6%)		
Class IV	8 (4.6%)	26 (14.9%)	34 (9.7%)		
Class V	2 (1.1%)	11 (6.3%)	13 (3.7%)		
Total	175 (100%)	175 (100%)	350 (100%)		
*Statistically Significant (Chi-Square Test applied)					

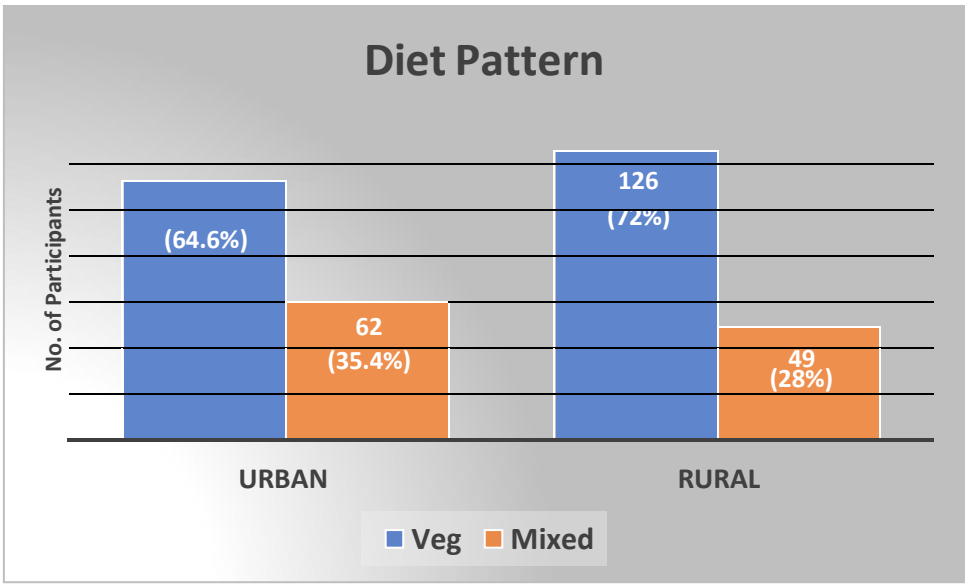
Modified B.G. Prasad Classification (2022)

Out of the 175 urban study population, 29.1% belonged to Class I, 51.4% belonged to Class II while 13.7% belonged to Class III, 4.6% belonged to Class IV and 1.1% belonged to Class V as per the Modified B.G. Prasad socio-economic classification (2021).

Out of the 175 rural study population, 3.4% belonged to Class I, 36% belonged to Class II, 39.4% belonged to Class III while 14.9% belonged to Class IV and 6.3% belonged to Class V as per the Modified B.G. Prasad socio-economic classification.

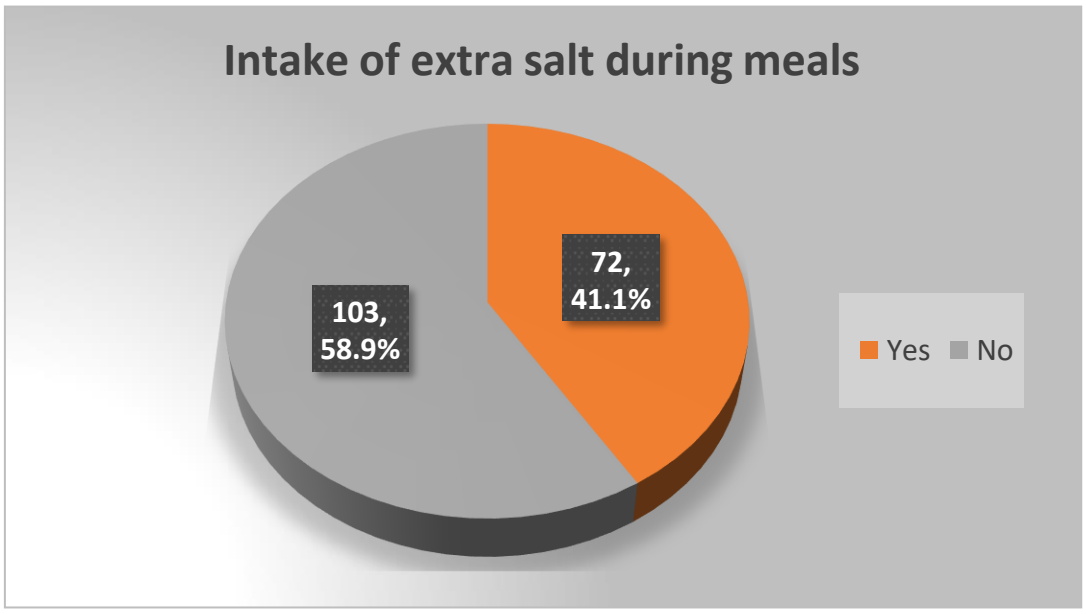
The difference in the socio-economic classes of the elderly was statistically significant in the urban and rural areas (P=0.0001).

Figure 4: Distribution of study population by diet pattern

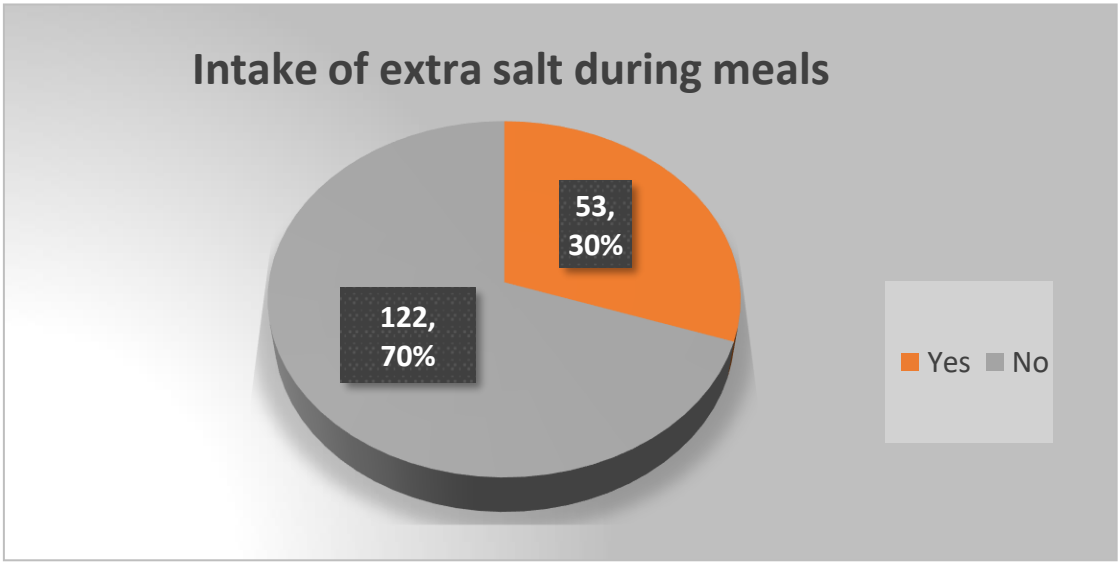


Among the total study participants, 68.3% were vegetarians while 31.7% were having a mixed diet. Participants having a mixed diet of veg and non-veg were more in the urban area (35.4%) compared to the rural area(28%). Vegetarians were more in number in the rural area (72%) compared to the urban area(64.6%).

Figure 5: Distribution of study population based on dietary habits-intake of extra salt during meals



Urban Area



Rural Area

Table 9: Distribution of study population based on dietary habits-intake of extra salt during meals

Intake of extra salt during meals	Urban N(%)	Rural N(%)	Pearson Chi-Square	P-Value
Yes	72 (41.1%)	53 (30.3%)	4.4924	0.034045*
No	103 (58.9%)	122 (69.7%)		
Total	175 (100%)	175 (100%)		

In this study it was found that more elderly in the urban area (41.1%) had intake of extra salt during meals compared to the rural area participants (30%). The

extra salt was in the form of table salt and/or high salt containing food like pickle, papad, etc.

Extra salt consumption among elderly in the urban and rural areas was found to be statistically significant (P=0.034).

Figure 6: Distribution of study population based on dietary habits- type of oil consumed.

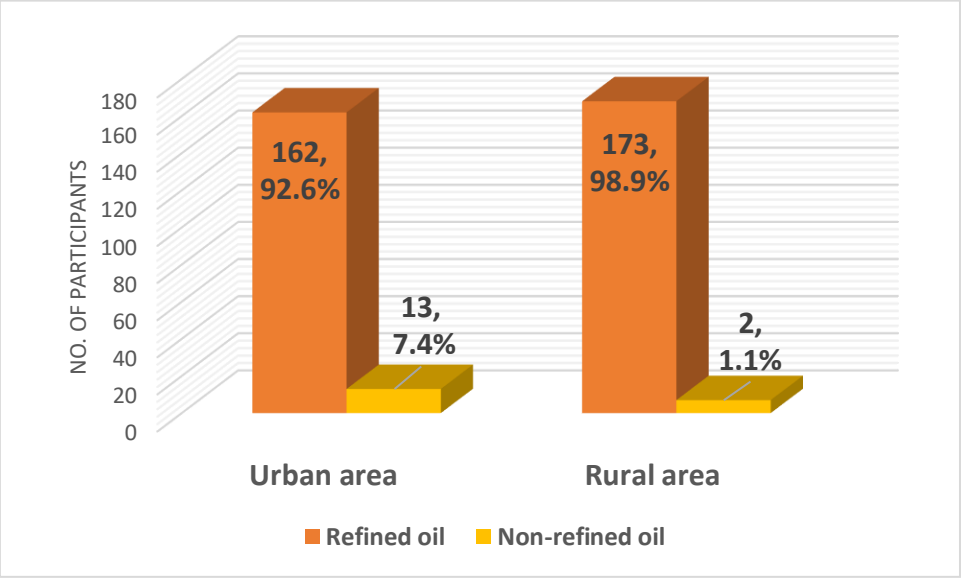


Table 10: Distribution of study population based on dietary habits- type of oil consumed.

Type of Oil Consumed	Urban N(%)	Rural N(%)	Pearson Chi-Square	P-Value
Refined Oil	162 (92.6%)	173 (98.9%)	9.4311	0.002133*
Non-refined Oil	13 (7.4%)	2 (1.1%)		
Total	175 (100%)	175 (100%)		

This study showed that more elderly (7.4%) in the urban area consumed non-refined oil compared to the rural elderly (1.1%).

The difference of cooking oil consumption between the elderly study subjects residing in urban and rural areas was found to be statistically significant (P=0.002).

Table 11: Distribution of study population by habits

Habits	Urban			Rural			Pearson Chi-Square	P-Value
	Males N(%)	Females N(%)	Total N(%)	Males N(%)	Females N(%)	Total N(%)	13.3001	0.00403*
Smoking	45 (97.8%)	1 (2.2%)	46 (100%)	25 (100%)	0	25 (100%)		
Alcohol Consumption	19 (100%)	0	19 (100%)	16 (94.1%)	1 (5.9%)	17 (100%)		
Tobacco Chewing	16 (59.3%)	11 (40.7%)	27 (100%)	24 (48%)	26 (52%)	50 (100%)		
Betel Chewing	4 (26.7%)	11 (73.3%)	15 (100%)	11 (64.7%)	6 (35.3%)	17 (100%)		
None	46 (56.1%)	36 (43.9%)	82 (100%)	45 (51.7%)	42 (48.3%)	87 (100%)		
More than one habit	14 (100%)	0	14 (100%)	21 (100%)	0	21 (100%)		
*Statistically Significant (Chi-Square Test applied)								

In this study it was found that the habit of smoking was more common in the urban study population (26.3%) compared to the rural elderly population (14.3%). Among the urban elderly smokers, smoking was more common among males (97.8%) compared to females (2.2%). On the other hand, among the rural elderly smoking habit was found only among males.

The habit of tobacco chewing was found to be more common among the rural elderly (28.6%) more so among the females (52%) compared to males (48%).

Among the urban elderly tobacco chewing was found to be 15.4% prevalent being more common among males (59.3%) than females (40.7%).

It was found in this study that in the urban population 46.9% of the elderly did not have any kind of habits, among which 56.1% were males, while females constituted 43.9%. In case of the rural study population, 49.7% refrained from any kind of habits among whom 51.7% were males and 48.3% were females.

Out of the 175 urban study population the 8% who had more than one habit, were all males. In the rural study population, among the 12% who had more than one habit, all were males.

Habits in the elderly residing in the urban and rural areas was found to be statistically significant (P=0.004). While smoking was more prevalent in the urban elderly subjects, tobacco chewing was more in rural elderly.

Figure 7: Mental Health of the study population

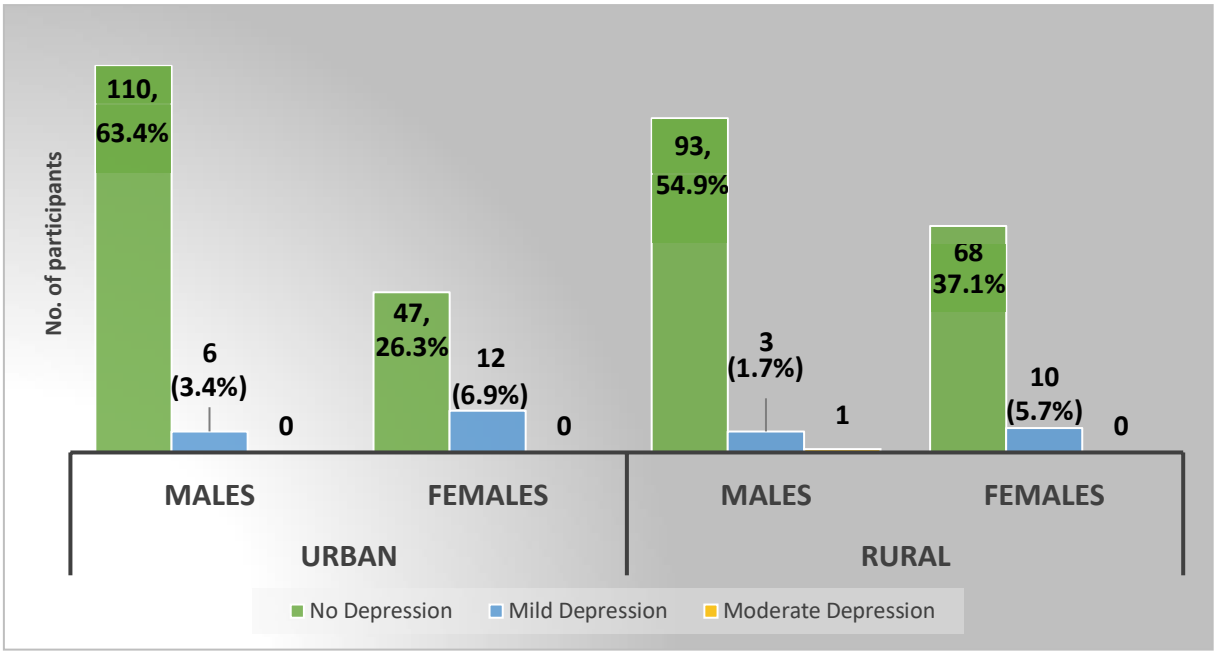


Table 12: Mental Health of the study population

Mental Health Score	Urban		Rural		Mann Whitney Test	Asyntotic Score
	Mean	S.D.	Mean	S.D.		
	3.22	2.568	3.10	3.248	13608.5	0.06

Out of the 350 study population, 9.1% suffered from depression which comprised of 6% of the elderly males and 14.2% of the total females.

In the urban area, 10.3% of the population were suffering from mild depression among which 33.3% were males while 66.7% were females. The remaining 89.7% of the population did not have depression of any kind.

In this study it was found that compared to the urban area depression in the rural area was less (8%) among the elderly. Among those suffering from mild depression in the rural area, 23% were males while 77% were females. One of the rural elderly males was found to be suffering from moderate depression. 96% of the rural elderly males and 86.7% of the rural elderly females did not suffer from any depression.

The mean mental health score (derived from Hamilton Mental Health Questionnaire) in the urban area was found to be 3.22 ± 2.568 while in the rural area the mean score was 3.10 ± 3.248. There was no statistically significant difference in the mental health of the elderly residing in the urban area compared to those residing in the rural area ($P=0.068$ Mann Whitney Test).

Table 13: Quality of Life among the Elderly

Grading of Quality of life	Urban			Rural		
	Males N(%)	Females N(%)	Total N(%)	Males N(%)	Females N(%)	Total N(%)
Poor	5 (4.3%)	4 (6.8%)	9 (5.1%)	12 (12%)	17 (22.7%)	29 (38.7%)
Fair	23 (19.8%)	22 (37.3%)	45 (25.7%)	77 (77%)	53 (70.7%)	130 (74.3%)
Good	75 (64.7%)	31 (52.5%)	106 (60.6%)	9 (9%)	5 (6.7%)	14 (8%)
Excellent	13 (11.2%)	2 (3.4%)	15 (8.6%)	2 (2%)	0	2 (1.1%)
Total	116 (100%)	59 (100%)	175 (100%)	100 (100%)	75 (100%)	175 (100%)

Among the 350 study participants the overall WHO BREF Quality of life scores of the elderly ranged from 28 to 94 with a mean score of 60.33 which comes under the category of fair quality of life.

In this study it was found that among the urban elderly population majority (60.6%) had a good quality of life whereas, in the rural elderly population only 8% of the study population had a good quality of life.

In the rural area majority (74.3%) of the elderly were having a fair or average quality of life. Comparatively in the urban elderly 25.7% were having an average quality of life.

In this study it was also found that among the remaining elderly, while 5.1% of the urban and 16.6% of the rural study population were having a poor quality of life; 8.6% and 1.1% of the urban and rural study subjects respectively, were having an excellent quality of life.

Table 14: Mean Scores of the different domains for evaluating Quality of Life of the study participants

	Urban		Rural		Mann Whitney U test	P-Value
Domains for evaluating the Quality of Life	Mean Score	Standard Deviation	Mean Score	Standard Deviation		
Physical Domain	68.41	11.648	56.51	13.091	6391.000	0.0001*
Psychological Domain	68.67	14.447	53.43	14.003	6207.500	0.0001*
Social Domain	72.15	14.119	47.39	13.887	4028.000	0.0001*
Environmental Domain	65.46	14.313	50.80	13.761	6011.500	0.0001*
Overall Score	68.697	12.168	52.097	12.119	5087.000	0.0001*
*Statistically significant (Chi-Square Test applied)						

The four domains used to calculate the quality of life using WHO BREF questionnaire includes the physical domain, psychological, social and environmental domains. The mean physical domain score among the urban elderly was 68.41±11.64 while in the rural elderly it was 56.51±13.09. The difference in the physical domain score was found to be statistically significant (P=0.0001).

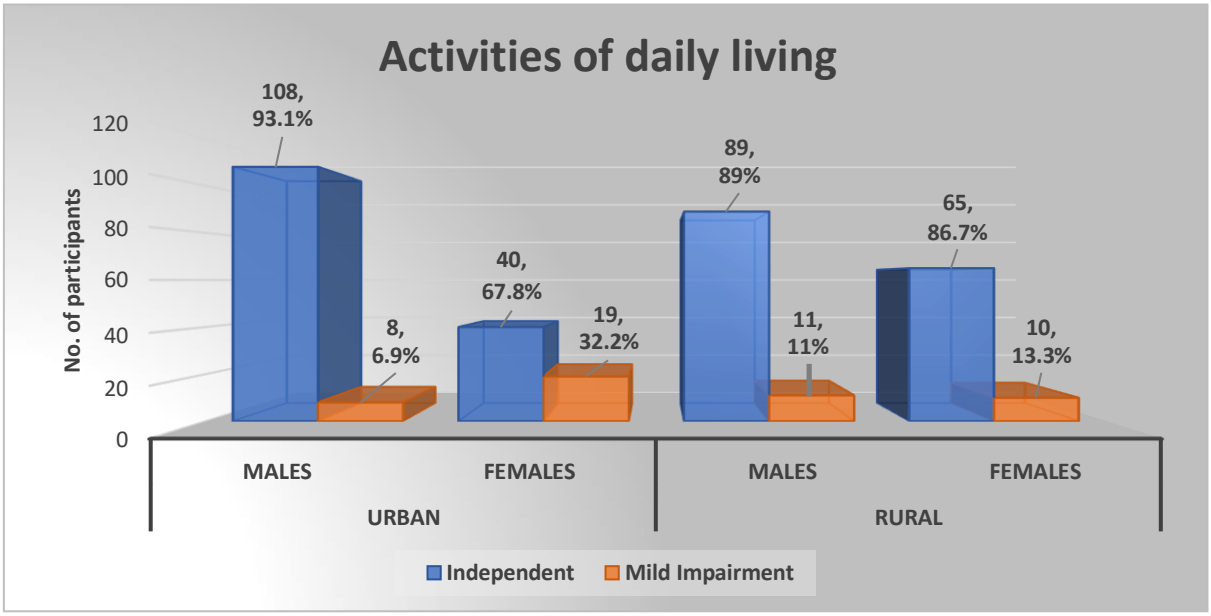
The psychological domain scores were 68.67±14.45 and 53.43±14 in the urban and rural area participants, respectively; the difference in the scores being statistically significant(P= 0.001).

The social domains scores were also found to be different. The scores were 72.15±14.11 and 47.39±13.88 in the urban and rural areas respectively. On comparison the difference was significant(P-value=0.0001).

The study revealed the environmental domain scores of the elderly participants to be 65.46±14.31 and 50.8±13.76 in the urban and rural areas respectively. The difference was found to be statistically significant(P=0.0001).

The overall quality of life score of the urban elderly was 68.69±12.16 which falls under the category of good quality of life. Comparatively, in the rural area the score was 52.09±12.12 which means the rural elderly study participants were having a fair quality of life. The difference in the overall score was statistically significant (P=0.0001).

Figure 8: Profile of Activities of daily living of elderly



The study of the activities of daily living of the elderly showed that in the urban area most (84.6%) of the subjects were independent and did not need much support for their daily activities like dressing, bathing, moving, etc. Among these independent elderly, 72.9% were males while 27.1% were females. The remaining 15.4% of the urban elderly comprising mostly of females (70.4%) and 29.6% males, were having mild impairment in carrying out their daily activities and needed support from others as they could not carry out some of the daily activities by themselves alone.

In the rural area, 88% of the study population were independent among whom 57.8% were males and remaining 42.2% were females. The remaining 12% of the rural study subjects had mild impairment in executing their daily activities, amongst whom were 52.4% males and 47.6% females.

The mean daily activity score in the urban elderly was 5.39±1.1 and in the rural elderly it was 5.54±0.756. There was no statistically significant difference in the score of the participants of the urban and rural areas.

Prevalence of chronic diseases among the elderly

Table 15: Morbidity profile among the elderly

Morbidity	**Urban** N(%)	**Rural** N(%)	**Pearson Chi Square**	**P value**
Dental Problems	25 (14.3%)	41 (41.1%)	48.986319	0.00018*
Joint Pain	73 (41.7%)	92 (52.6%)		
Cardiovascular Disease	2 (1.1%)	1 (0.6%)		
Hypertension	64 (36.6%)	56 (32%)		
Diabetes	49 (28%)	37 (21.1%)		
Varicose Veins	2 (1.1%)	3 (1.7%)		
Impaired Hearing	41 (23.4%)	45 (25.7%)		
Impaired Vision	32 (18.3%)	65 (37.1%)		
Anaemia	11 (6.3%)	17 (9.7%)		
Constipation	8 (4.6%)	3 (1.7%)		
Breathlessness	32 (18.3%)	21 (12%)		
Chronic Renal Disease	2 (1.1%)	0		
Urinary Tract Infection	4 (2.2%)	11 (6.3%)		
Benign Prostrate Hypertrophy	5 (2.3%)	3 (1.7%)		
Asthma	4 (2.2%)	6 (3.4%)		
Gastritis	15 (8.6%)	6 (3.4%)		
Haemorrhoids	5 (2.9%)	2 (1.1%)		
Cataract	11 (6.3%)	6 (3.4%)		
Underweight (BMI<18.5)	12 (6.9%)	15 (8.6%)		
Overweight (BMI>=25)	72 (41.1%)	39 (22.3%)		
*Statistically Significant (Chi-Square Test applied)				

It was found in this study that joint pain was the most common morbidity in the study population. It was more prevalent in the rural area compared to urban area.

Joint pain was followed by hypertension in prevalence. It was more common in urban area compared to rural.

The other common morbidities present in the 350 study population were diabetes, impaired vision, impaired hearing, overweight, dental problems and breathlessness.

While diabetes, breathlessness and overweight were more common in the urban elderly, impaired vision and hearing, dental problems and anaemia were more prevalent in the rural elderly.

Table 16: Comparison of Morbidity of study participants in urban and rural areas

Morbidity	Urban N(%)	Rural N(%)	Pearson Chi Square	P-Value
Hypertension			0.8115	0.3676
Yes	64 (36.6%)	56 (32%)		
No	111 (63.4%)	119 (68%)		
Diabetes				
Yes	50 (28.6%)	37 (21.1%)	2.5851	0.10787
No	125 (71.4%)	138 (78.9%)		
Anaemia				
Yes	11 (6.3%)	17 (9.7%)	1.3975	0.2371
No	164 (93.7%)	158 (90.3%)		
Joint Pain				
Yes	73 (41.7%)	92 (52.6%)	4.13923	0.0419*
No	102 (58.3%)	83 (47.4%)		
Dental Problems				
Yes	25 (14.3%)	41 (23.4%)	4.78019	0.02878*
No	150 (85.7%)	134 (76.6%)		
Impaired Vision				
Yes	32 (18.3%)	64 (36.6%)	14.6981	0.00013*
No	143 (81.7%)	111 (63.4%)		
Impaired Hearing			0.24665	0.6194
Yes	41 (23.4%)	45 (25.7%)		
No	134 (76.6%)	130 (74.3%)		
*Statistically Significant (Chi-Square Test applied)				

Statistical significance was found in the difference of prevalence of joint pain, dental problems and impaired vision between the urban and rural elderly participants. All the three morbidities were present significantly more in the rural area.

Table 17: Distribution of study subjects by the number of chronic diseases

Number of chronic diseases	Urban N(%)	Rural N(%)	Total N(%)
No chronic disease	38 (21.9%)	27 (15.4%)	65 (37.1%)
One chronic disease	49 (28%)	39 (22.3%)	88 (50.3%)
Two chronic diseases	35 (20%)	40 (22.9%)	75 (42.9%)
Three or more chronic diseases	53 (30.1%)	69 (39.4%)	122 (69.7%)
Total	175 (100%)	175 (100%)	350 (100%)

Most of the study participants (69.7%) had three or more chronic diseases and comparatively few (37.1%) had no chronic diseases present.

Table 18: Distribution of the Elderly by other Medical Complaints

Other Medical complaints	Urban N(%)	Rural N(%)	Pearson Chi Square	P-Value
Bodyache	9 (5.1%)	6 (3.4%)	11.37789	0.022629*
Tremors	5 (2.9%)	8 (4.6%)		
Headache	12 (6.9%)	3 (1.7%)		
Skin problems	6 (3.4%)	15 (8.6%)		
Oedema	6 (3.4%)	10 (5.7%)		
*Statistically Significant (Chi-Square Test applied)				

Skin problems and tremors were present more in the rural elderly whereas headache and bodyache was more common in the urban area. Statistical significance in the difference of these morbidities between urban and rural participants was present(P=0.023).

Table 19: Psychological Profile of the Study Participants

Psychological Complaints	Urban n(%)	Rural n(%)	Pearson Chi Square	P-Value
Depression	18 (10.3%)	14 (8%)	5.8597	0.20987
Insomnia	71 (40.6%)	55 (31.4%)		
Anxiety	26 (14.9%)	18 (10.3%)		
Weakness/fatigue	14 (8%)	22 (12.6%)		
Loneliness	11 (6.3%)	16 (9.1%)		

Depression was found to be more common in the urban elderly compared to the rural elderly participants.

Figure 9: Distribution of Anaemic elderly as per their haemoglobin levels

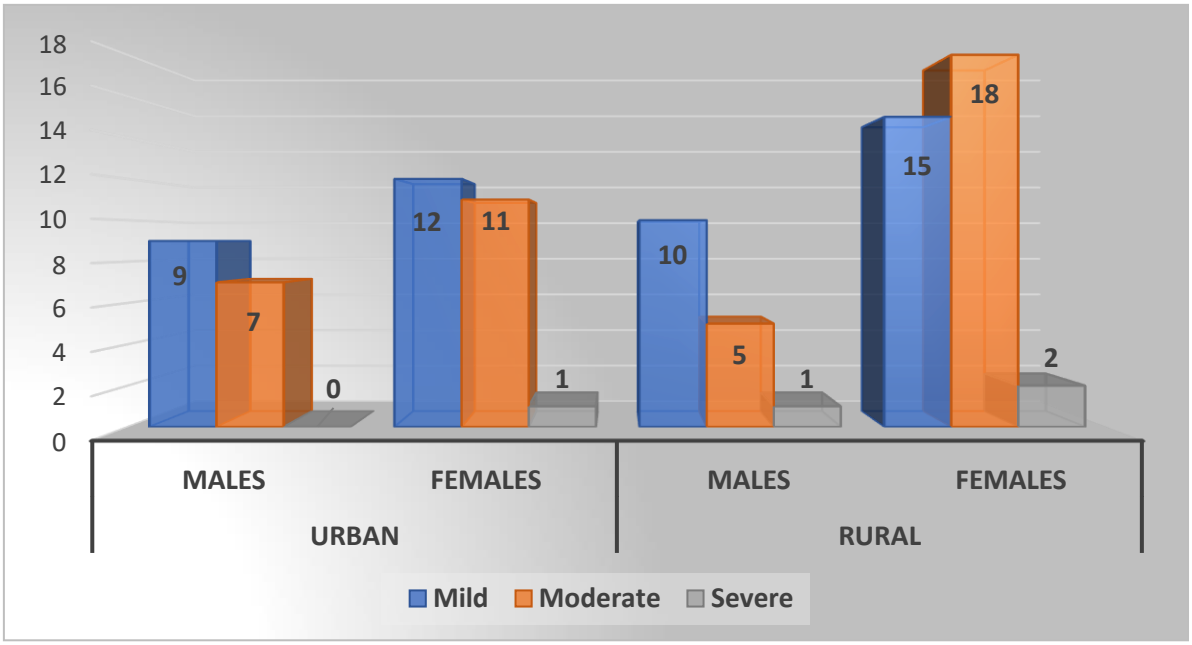


Table 20: Anaemia Profile of the study participants

Haemoglobin Level	Urban n (%)	Rural n (%)	Pearson Chi Square	P-Value
Normal Participants	135 (77.1%)	124 (70.1%)	1.7969	0.18009
Anaemic Participants				
Mild Anaemia	21 (12%)	25 (14.3%)		
Moderate Anaemia	18 (10.3%)	23 (13.1%)		
Severe Anaemia	1 (0.6%)	3 (1.7%)		

On studying the haemoglobin levels of the participants, it was found that out of the total 350 study participants, 259 (74%) were having normal haemoglobin

levels while 91 (26%) were anaemic.

On comparison of the urban and rural findings it was seen that there were more elderly who were suffering from anaemia in the rural area (29.1%) against the 22.9% elderly study participants in the urban area.

Among the 175 elderly in the urban area, 21 (12%) were mildly anaemic, 18(10.3%) were moderately anaemic while one of them was severely anaemic.

Among the 175 rural elderly study participants, 25(14.3%) were having mild anaemia, 23(13.1%) were having moderate anaemia while 3 (1.7%) were having severe anaemia. It was surprising to find that there was no statistically significant difference in the prevalence of anaemia in the urban and rural areas(P=0.18009).

Table 21: Distribution of study participants as per treatment being availed for chronic diseases

Treatment being availed	Urban N(%)	Rural N(%)	Total N(%)	Pearson Chi Square	P-Value
Yes	91 (66.4%)	64 (43.2%)	155 (54.4%)	15.40931	0.0001*
No	46 (33.6%)	84 (56.8%)	130 (45.6%)		
Total	137 (100%)	148 (100%)	285 (100%)		
*Statistically Significant (Chi-Square Test applied)					

It was seen in this study that while most (66.4%) of the urban elderly were availing treatment for their respective chronic diseases, most (56.8%) of the rural participants were not doing so. This difference was statistically significant.

Table 22: Distribution of participants based on type of treatment being availed

Type of treatment	Urban N(%)	Rural N(%)	Pearson Chi Square	P-Value
Allopathy	64 (70.3%)	38 (59.4%)	7.7482	0.0207*
Ayurvedic	26 (28.6%)	19 (29.7%)		
Homeopathic	1 (0.6%)	7 (10.9%)		

It was seen in this study that among the elderly who were taking medications for their chronic diseases, majority were taking Allopathic treatment whereas few were taking ayurvedic or homeopathic treatment too.

Table 23: Type of Surgery undergone by the study participants

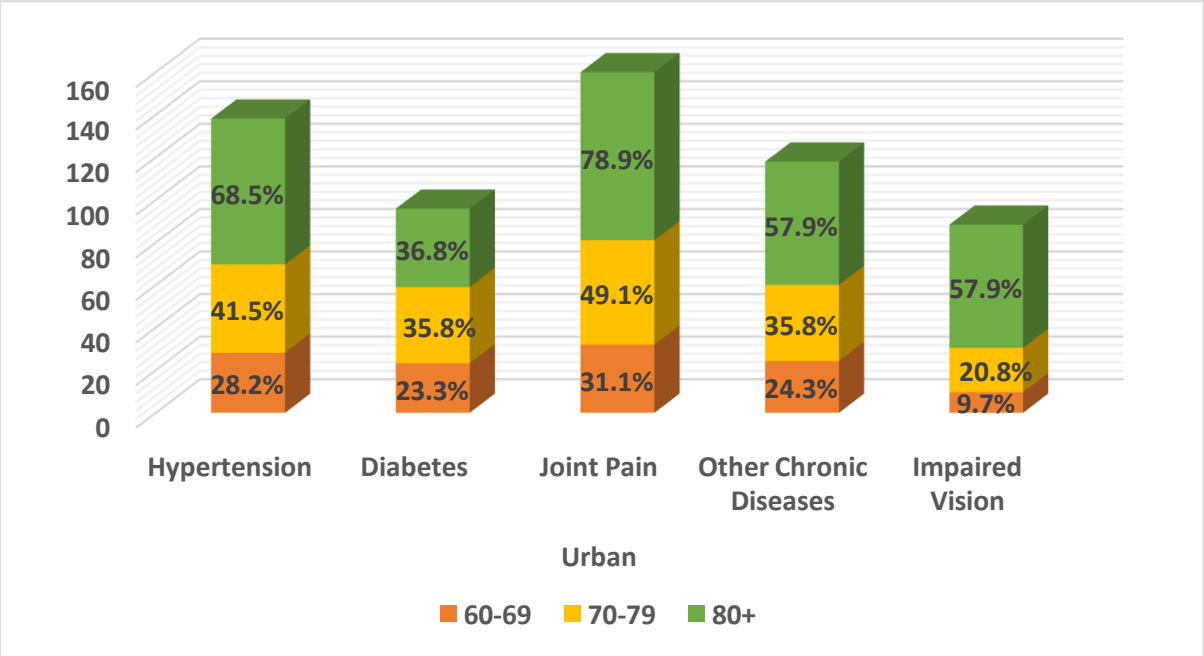
Type of Operation	Urban			Rural		
	Males	Females	Total	Males	Females	Total
Appendicectomy	0	1	1	0	1	1
CABG	2	1	3	1	0	1
Cataract	12	6	18	7	5	12
Cholecystectomy	0	0	0	1	0	1
Haemorrhoidectomy	0	1	1	0	0	0
Orthopaedic	2	1	3	0	1	1
Hernioplasty	3	1	4	3	0	3
Hydrocele	3	0	3	1	0	1
Hysterectomy	0	1	1	0	1	1
Tubectomy	0	9	9	0	5	5
Total	22	21	43	13	13	26

It was found in this study that majority of the participants had undergone cataract surgery more so in the urban area. Cataract surgery was followed by tubectomies and hernioplasties in number.

Association of Chronic diseases with different factors

Association of Chronic diseases with age

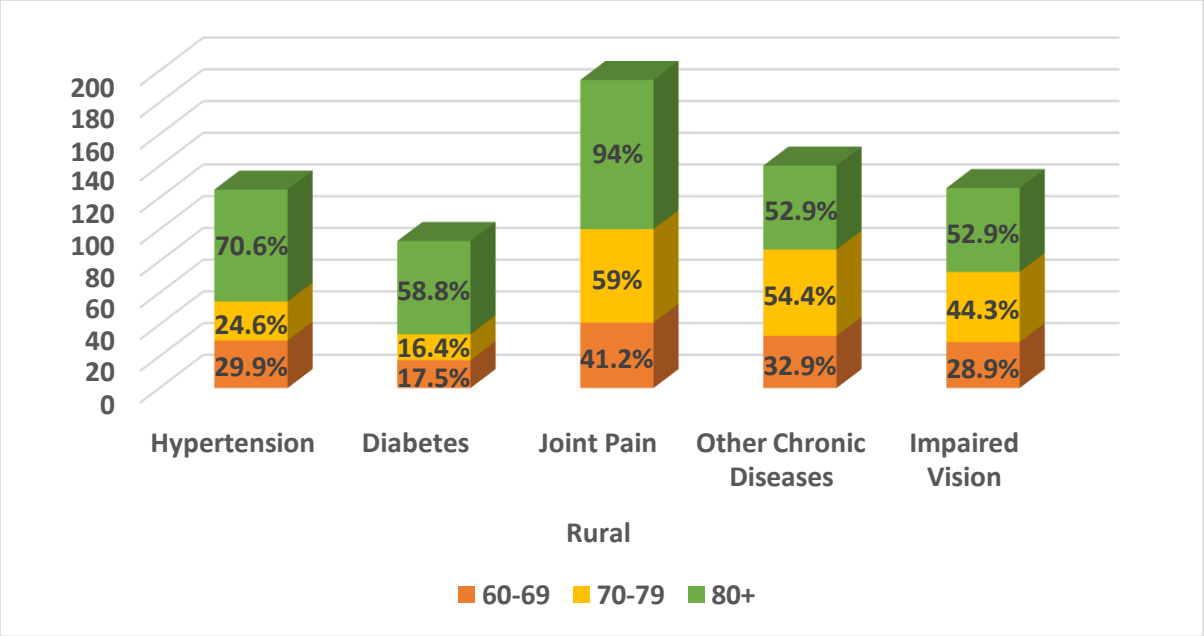
Figure 10: Prevalence of Chronic Diseases in different age groups of the urban study participants



This study showed that the prevalence of morbidity increased with age among the elderly study participants. It was seen that the age group of 80 years and above had more morbidity than other age groups. The elderly in the age of 80 and above mostly suffered from joint pain, hypertension and impaired vision.

Joint pain was common even in the age group of 60 to 69 years old study participants. The other chronic diseases category included mostly impaired hearing, COPD and cardiovascular diseases.

Figure 11: Prevalence of Chronic Diseases in different age groups of the rural study participants



It was seen in this study that rural elderly participants in the age group of 80 and above suffered mostly from joint pain (94%) and hypertension (70.6%). Joint

pain was fairly common in the age groups of 70 to 79 years (59%) and 60 to 69 years (41.2%) also. The other chronic diseases which the rural suffered from mostly included dental problems, COPD and impaired hearing.

Table 24: Association of morbidity with age of urban elderly

Morbidity	Age Groups			Total	P-value
	60-69 (n=103)	70-79 (n=53)	80 and above (n=19)		
Hypertension	29 (28.2%)	22 (41.5%)	13 (68%)	64	0.0078*
Diabetes	24 (23.3%)	19 (35.8%)	7 (36.8%)	50	0.28967
Joint pain	33 (32%)	26 (49.1%)	15 (78.9%)	74	0.0001**
Dental problems	8 (7.8%)	9 (17%)	4 (21.1%)	21	0.41712#
Respiratory Morbidity	25 (24.3%)	2 (3.8%)	4 (21.1%)	31	0.34659#
Depression	4 (3.9%)	6 (11.3%)	8 (42.1%)	18	0.00008**
Impaired Vision	10 (9.7%)	11 (20.8%)	11 (57.9%)	32	0.00001*
Impaired Hearing	13 (12.6%)	17 (32.1%)	11 (57.9%)	41	0.00001*
Miscellaneous	13 (12.6%)	15 (28.3%)	5 (26.3%)	33	0.82698#
*Statistically Significant (Chi-Square Test applied)					
**Significant after Yates correction (Fischer Exact Test applied)					
# Yates correction done (Fischer Exact Test applied)					

To calculate Chi-Square test study subjects were clubbed into two groups i.e., ≤75 years and >75 years.

In the urban elderly it was found that the association between age and hypertension, age and joint pain, age and depression, age and impaired vision and age and impaired hearing were statistically significant.

All these morbidities were found to increase proportionately with age, being most commonly present in the 80 years and above age group of elderly.

Table 25: Association of morbidity with age of rural elderly

Morbidity	Age Groups			Total	P-value
	60-69 (n=97)	70-79(n=61)	>=80(n=17)		
Hypertension	29 (29.9%)	15 (24.6%)	12 (70.6%)	56	0.01386*
Diabetes	17 (17.5%)	10 (16.4%)	10 (58.8%)	37	0.01744*
Joint pain	40 (41.2%)	36 (59%)	16 (94.1%)	92	0.0016**
Dental problems	18 (18.6%)	15 (24.6%)	7 (41.2%)	40	0.25813
Respiratory	12 (12.4%)	11 (18%)	4 (23.5%)	27	0.4511
Depression	6 (6.2%)	6 (9.8%)	2 (11.8%)	14	0.5401#
Impaired Vision	28 (28.9%)	27 (44.3%)	9 (52.9%)	64	0.11469
Impaired Hearing	15 (15.5%)	15 (24.6%)	15 (88.2%)	45	0.0001*
Miscellaneous	12 (12.4%)	11 (18%)	2 (11.8%)	25	0.9058#
*Statistically Significant (Chi-Square Test applied)					
** Statistically Significant; Yates correction done (Fischer Exact Test applied)					
# Yates correction done (Fischer Exact Test applied)					

To calculate Chi-Square test study subjects were clubbed into two groups i.e., ≤75 years and >75 years.

Among the rural elderly association between age and hypertension, diabetes, joint pain as well as impaired hearing was found to be statistically significant.

All these morbidities were found to increase with age, being most commonly present in the 80 years and above age group of elderly followed by the 70-79 year old age group.

Table 26: Association of morbidity with gender of Urban study participants

Morbidity	Gender		Total	P-Value
	Male (n=116)	Female (n=59)		
Hypertension	39 (33.6%)	25 (42.4%)	64	0.2557
Diabetes	35 (30.2%)	15 (25.4%)	50	0.5109
Joint pain	41 (35.3%)	33 (55.9%)	74	0.0092*
Dental problems	12 (10.3%)	9 (15.3%)	21	0.4847#
Respiratory	28 (24.1%)	3 5.1%)	31	0.0036**
Depression	6 (5.2%)	12 (20.3%)	18	0.0042**
Impaired Vision	19 (16.4%)	13 (22%)	32	0.3603
Impaired Hearing	21 (18.1%)	20 (33.9%)	41	0.0197*
Miscellaneous	21 (18.1%)	12 (20.3%)	33	0.7208
*Statistically Significant (Chi-Square Test applied)				
** Statistically Significant; Yates correction done (Fischer Exact Test applied)				
# Yates correction done (Fischer Exact Test applied)				

Among the urban elderly statistical significance in the association between gender and morbidity was found for the following morbidities- joint pain, respiratory morbidities, depression and impaired hearing. All these morbidities other than respiratory morbidity, were present much more in the female elderly.

Table 27: Association of morbidity with gender of Rural study participants

Morbidity	Gender		Total	P-Value
	Male (n=100)	Female (n=75)		
Hypertension	31 (31%)	25 (33.3%)	56	0.7433
Diabetes	22 (22%)	15 (20%)	37	0.7485
Joint pain	51 (51%)	41 (54.7%)	92	0.6307
Dental problems	16 (16%)	24 (32%)	40	0.0126*
Respiratory	22 (22%)	5 (6.7%)	27	0.01025**
Depression	4 (4%)	10 (13.3%)	14	0.0487**
Impaired Vision	34 (34%)	30 (40%)	64	0.4148
Impaired Hearing	24 (24%)	21 (28%)	45	0.5491
Miscellaneous	10 (10%)	15 (20%)	25	0.0614
*Statistically Significant (Chi-Square Test applied)				
** Statistically Significant; Yates correction done (Fischer Exact Test applied)				

Among the rural study participants association between gender and dental problems, respiratory morbidities as well as depression was found to be statistically significant.

More number of females suffered from dental problems and depression compared to males.

Table 28: Association of Education with Morbidity of Urban elderly

Morbidity	Illiterates	Literates					
		Primary	Secondary	College	Graduate	Total Literates	P-Value
Hypertension	21 (33%)	28	10	3	2	43 (67%)	0.0002*
Diabetes	10 (16%)	30	7	1	2	40 (84%)	0.7106
Joint pain	29 (39%)	25	9	6	5	45 (61%)	0.00001*
Dental problems	7 (33%)	6	3	2	3	14 (67%)	0.1094#
Respiratory	4 (13%)	16	8	1	2	27 (87%)	0.5495#
Depression	9 (50%)	8	1	0	0	9 (50%)	0.0008**
Impaired Vision	10 (31%)	11	4	1	6	22 (69%)	0.0358*
Impaired Hearing	14 (34%)	14	5	1	7	27 (66%)	0.0027*
Miscellaneous	9 (27%)	12	7	3	2	24 (73%)	0.2177#
*Statistically Significant (Chi-Square Test applied)							
** Statistically Significant; Yates correction done (Fischer Exact Test applied)							
# Yates correction done (Fischer Exact Test applied)							

This table shows that statistical significance was found between education and hypertension, joint pain, depression, impaired vision and hearing among the urban elderly. Among the hypertensives more were literates(67%); more literates (60.8%) were also suffering from joint pain.

Table 29: Association of Education with Morbidity of Rural elderly

Morbidity	Illiterates	Literates					
		Primary	Secondary	College	Graduate	Total Literates	P-Value
Hypertension	36 (64%)	11	5	1	3	20 (36%)	0.7010
Diabetes	20 (54%)	6	7	1	3	17 (46%)	0.0763
Joint pain	68 (74%)	13	9	1	1	24 (26%)	0.0246*
Dental problems	31 (78%)	4	4	1	0	9 (22%)	0.1291#
Respiratory	17 (63%)	4	6	0	0	10 (37%)	0.6913
Depression	13 (93%)	0	1	0	0	1 (7%)	0.0577#
Impaired Vision	46 (72%)	10	6	0	2	18 (28%)	0.2350
Impaired Hearing	31 (69%)	7	5	1	1	14 (31%)	0.6682
Miscellaneous	19 (76%)	5	1	0	0	6 (24%)	0.3782#
*Statistically Significant (Chi-Square Test applied)							
# Yates correction done (Fischer Exact Test applied)							

In this table it is shown that there is statistical significance in the association between literacy and joint pain. Most (74%) of the elderly having joint pain were illiterates.

Table 30: Association of Socioeconomic Class with Morbidity of urban elderly

Morbidity	Socioeconomic Status					Total	P-value
	Class I	Class II	Class III	Class IV	Class V		
Hypertension	15 (23.4%)	34 (53.1%)	9 (14.1%)	5 (7.8%)	1 (1.5%)	64 (100%)	0.2127#
Diabetes	10 (20%)	26 (52%)	11 (22%)	3 (6%)	0	50 (100%)	0.7968#
Joint pain	15 (20.3%)	43 (58.1%)	8 (10.8%)	6 (8.1%)	2 (2.7%)	74 (100%)	0.031**
Dental problems	8 (38.1%)	10 (47.6%)	2 (9.5%)	1 (4.8%)	0	21 (100%)	0.7637#
Respiratory	13 (41.9%)	13 (41.9%)	3 (9.7%)	2 (6.5%)	0	31 (100%)	0.8169#
Depression	0	14 (77.8%)	0	3 (16.7%)	1 (5.6%)	18 (100%)	0.0081**
Impaired Vision	10 (31.3%)	13 (40.6%)	4 (12.5%)	5 (15.6%)	0	32 (100%)	0.0244**
Impaired Hearing	11 (26.8%)	23 (56.1%)	4 (9.8%)	3 (7.3%)	0	41 (100%)	0.9038#
Miscellaneous	7 (21.2%)	19 (57.6%)	2 (6.1%)	5 (15.2%)	0	33 (100%)	0.0295**
** Statistically Significant; Yates correction done (Fischer Exact Test applied)							
# Yates correction done (Fischer Exact Test applied)							

This table shows that there is statistical significance in the association between Socioeconomic status and joint pain, SES and depression, SES and impaired vision and other miscellaneous morbidities including anaemia, skin problems among others. Among the urban elderly suffering from joint pain, most (78.4%) belonged to the upper socioeconomic classes ie. Upper class and upper middle class. Among those elderly suffering from depression most (77.8%) belonged to upper socioeconomic classes.

Table 31: Association of Socioeconomic Class with Morbidity of Rural elderly

Morbidity	Socioeconomic Status					Total	P-value
	Class I	Class II	Class III	Class IV	Class V		
Hypertension	1 (1.8%)	22 (39.2%)	19 (33.9%)	12 (21.4%)	2 (3.6%)	56 (100%)	0.3913
Diabetes	0	10 (27%)	17 (45.9%)	7 (18.9%)	3 (8.1%)	37 (100%)	0.3236
Joint pain	1 (1.1%)	30 (32.6%)	37 (40.2%)	17 (18.5%)	7 (7.6%)	92 (100%)	0.0917
Dental problems	0	17 (42.5%)	16 (40%)	4 (10%)	3 (7.5%)	40 (100%)	0.673#
Respiratory	2 (7.4%)	9 (33.3%)	10 (37%)	5 (18.5%)	1 (3.7%)	27 (100%)	0.9148#
Depression	1 (7.1%)	2 (14.3%)	3 (21.4%)	2 (14.3%)	6 (42.9%)	14 (100%)	0.0019**
Impaired Vision	0	23 (35.9%)	27 (42.2%)	9 (14.1%)	5 (7.8%)	64 (100%)	0.8571
Impaired Hearing	0	18 (40%)	15 (33.3%)	8 (17.8%)	4 (8.9%)	45 (100%)	0.2924
Miscellaneous	0	6 (24%)	13 (52%)	5 (20%)	1 (4%)	25 (100%)	0.9097#
** Statistically Significant; Yates correction done (Fischer Exact Test applied)							
# Yates correction done (Fischer Exact Test applied)							

This table shows that in the rural elderly, statistical association was found between SES and depression. Most (78.6%) of the depressed elderly belonged to lower socioeconomic classes (middle class, lower middle class and lower class).

Table 32: Association of Habits with Morbidity of Urban Elderly

Morbidity	Habits				No Habits	P-Value
	Smoking	Alcohol	Tobacco Chewing	Betel Chewing		
Hypertension	26	7	16	8	18	0.00016*
Diabetes	16	6	7	6	19	0.1375
Joint pain	18	6	16	9	29	0.0818
Dental problems	5	2	6	1	8	0.3910
Respiratory	21	3	3	2	6	0.0015**
Depression	3	0	6	1	9	0.9738
Impaired Vision	8	1	7	2	16	0.6934
Impaired Hearing	9	3	13	2	16	0.2507
Miscellaneous	7	3	4	3	18	0.3258
*Statistically Significant (Chi-Square Test applied)						
** Yates Correction done; Statistically Significant						

This table shows that there is statistical significance in the association between habits of the urban elderly and hypertension as well as habits and respiratory morbidities. Most (71.9%) of the hypertensives were involved in a habit of some or the other kind. 67.7% of the elderly suffering from breathlessness were involved in smoking tobacco.

Table 33: Association between Hypertension and Habits of Urban Elderly

Hypertension	P-value		
	Smoking	Tobacco chewing	Alcohol Intake
	0.0011*	0.0078*	0.9793
*Statistically Significant (Chi-Square Test applied)			

This table shows that statistical significance was found in the association between urban hypertensives and smokers as well as the hypertensives and tobacco chewers.

Table 34: Association between Breathlessness and Smoking in Urban elderly

Breathlessness	Smoking (P-Value)
	0.0001*
* Statistically Significant (Chi-Square Test applied)	

This table shows that statistical significance was found between the urban elderly having breathlessness and smokers using chi-square test.

Table 35: Association of Habits with Morbidity of Rural Elderly

Morbidity	Habits				No Habits	P-Value
	Smoking	Alcohol	Tobacco Chewing	Betel Chewing		
Hypertension	17	10	26	12	11	0.0001*
Diabetes	6	8	15	4	12	0.1790*
Joint pain	12	12	27	10	44	0.5989
Dental problems	4	2	28	5	7	0.0001**
Respiratory	15	4	12	3	7	0.0131**
Depression	1	1	2	3	7	0.7977
Impaired Vision	7	4	31	5	25	0.0324*
Impaired Hearing	5	5	14	5	22	0.8978
Miscellaneous	3	0	7	3	14	0.4972
*Statistically significant (Chi-square Test applied)						
**Statistically significant (Yates Correction done; Fischer Exact Test applied)						

This table shows that significant association was found for the rural elderly, between habits and hypertension, habits and diabetes, habits and dental problems, habits and respiratory morbidity.

Table 36: Association between Hypertension and Habits of Rural Elderly

Hypertension	P-value		
	Smoking	Tobacco chewing	Alcohol Intake
	0.00008**	0.00033*	0.0263**
*Statistically Significant (Chi-Square Test applied)			
** Yates Correction done; Statistically Significant			

This table shows that the association between rural elderly having diabetes and their habits of smoking, tobacco chewing and alcohol consumption was statistically significant. Most (46.4%) of the rural hypertensives were tobacco chewers.

Table 37: Association between Diabetes and Habits of Rural Elderly

Diabetes	P-value		
	Smoking	Tobacco chewing	Alcohol Intake
	0.9097	0.0695	0.01463**
** Yates Correction done; Statistically Significant (Fischer Exact Test used)			

The association between diabetes and alcohol intake was significant.

Table 38: Association between Dental problems and Habits of Rural Elderly

Dental problems	P-value			
	Smoking	Tobacco chewing	Alcohol Intake	Betel chewing
	0.5322	0.0001*	0.3996	0.7088
*Statistically Significant (Chi-Square Test applied)				

The association between dental problems and tobacco chewing in the rural elderly was statistically significant via chi square test.

Table 39: Association between Breathlessness and Smoking in Rural elderly

Breathlessness	Smoking (P-Value)
	0.0001*
* Statistically Significant (Chi-Square Test applied)	

This table shows that statistical significance was found between the rural elderly having breathlessness and smokers using chi-square test.

Table 40: Association of extra salt intake in diet with Morbidity of Urban elderly

Morbidity	Extra Salt intake in diet		Total	P-Value
	Yes (58) n(%)	No (117) n(%)		
Hypertension	46 (71.9%)	18 (28.1%)	64 (100%)	0.0001*
Diabetes	20 (40%)	30 (60%)	50 (100%)	0.2229
Joint pain	30 (51.7%)	44 (48.3%)	74 (100%)	0.0752
Dental problems	7 (12.1%)	14 (87.9%)	21 (100%)	0.8202
* Statistically Significant (Chi-Square Test applied)				

It was seen in this study that the association between hypertension and the urban elderly consuming extra salt in their diet was statistically significant. 71.9% of the hypertensives were taking extra salt in their diet.

Table 41: Association of extra salt intake in diet with morbidity of Rural elderly

Morbidity	Extra Salt intake in diet		Total	P-Value
	Yes (53) n(%)	No (122) n(%)		
Hypertension	50 (89.3%)	6 (10.7%)	56 (100%)	0.0001*
Diabetes	16 (43.2%)	21 (56.8%)	37 (100%)	0.0534
Joint pain	27 (29.3%)	65 (70.7%)	92 (100%)	0.7762
Dental problems	14 (35%)	26 (65%)	40 (100%)	0.4600
*Statistically significant (Chi-square Test applied)				

This table shows that the association between rural hypertensives and the habit of consuming extra salt in the diet was statistically significant. 89.3% of the hypertensives were consuming extra salt in their meals through table salt, papad, pickle, etc.

Table 42: Association of BMI with Morbidity of Urban Elderly

Morbidity	Body Mass Index		Total	P-Value
	Normal (102)	Overweight (73)		
Hypertension	25 (39.1%)	39 (60.9%)	64 (100%)	0.0009*
Diabetes	12 (24%)	38 (76%)	50 (100%)	0.0001*
Joint pain	40 (54.1%)	34 (45.9%)	74 (100%)	0.3312
Dental problems	12 (57.1%)	9 (42.9%)	21 (100%)	0.9024
Respiratory	14 (45.2%)	17 (54.8%)	31 (100%)	0.1023
Depression	10 (55.6%)	8 (44.4%)	18 (100%)	0.9965
Impaired Vision	21 (65.6%)	11 (34.4%)	32 (100%)	0.3516
Impaired Hearing	28 (68.3%)	13 (31.7%)	41 (100%)	0.1375
Miscellaneous	17 (51.5%)	16 (48.5%)	33 (100%)	0.3812
*Statistically significant (Chi-square Test applied)				

This table shows that there was statistical significance in the association between the urban hypertensives and overweight elderly(BMI>=25) and diabetics and overweight elderly. While 61% of the hypertensives were found to be overweight, 76% of the diabetics were overweight.

Table 43: Association of BMI with Morbidity of Rural Elderly

Morbidity	Body Mass Index		Total	P-Value
	Normal (136)	Overweight (39)		
Hypertension	43 (76.8%)	13 (23.2%)	56 (100%)	0.8395
Diabetes	31 (83.8%)	6 (16.2%)	37 (100%)	0.4374
Joint pain	78 (84.8%)	14 (15.2%)	92 (100%)	0.0180
Dental problems	36 (90%)	4 (10%)	40 (100%)	0.0562
Respiratory	21 (77.8%)	6 (22.2%)	27 (100%)	0.8081
Depression	13 (92.9%)	1 (7.1%)	14 (100%)	0.2780
Impaired Vision	60 (93.8%)	4 (6.2%)	64 (100%)	0.0002
Impaired Hearing	38 (84.4%)	7 (15.6%)	45 (100%)	0.2933
Miscellaneous	22 (88%)	3 (12%)	25 (100%)	0.28226

This table shows that the rural hypertensives or diabetics did not have any association with BMI.

Table 44: Association of Mental Health of Urban Elderly with Different Factors

Factors related to Mental Health		Mental Health		Total	P-Value
		Depressed	No Depression		
Age	≤75	9 (6.1%)	139 (93.9%)	148 (100%)	0.0001**
	75+	9 (33.3%)	18 (66.7%)	27 (100%)	
Sex	Male	6 (5.2%)	110 (94.8%)	116 (100%)	0.0042**
	Female	12 (20.3%)	47 (79.7%)	59 (100%)	
Education	Illiterates	9 (28.1%)	23 (71.9%)	32 (100%)	0.0008**
	Literates	9 (6.3%)	134 (93.7%)	143 (100%)	
Socioeconomic Status	Class I&II	14 (9.9%)	127 (90.1%)	141 (100%)	0.9986
	Class III and below	4 (11.8%)	30 (88.2%)	34 (100%)	
Family	Single	3 (27.3%)	8 (72.7%)	11 (100%)	0.1606
	Others	15 (9.1%)	149 (90.9%)	164 (100%)	
Habits	No Habits	9 (11%)	73 (89%)	82 (100%)	0.9739
	One or More habits	9 (9.7%)	84 (90.3%)	93 (100%)	
Chronic Diseases	No chronic disease	0	38 (100%)	38 (100%)	-
	One or more chronic diseases present	18 (13.1%)	119 (86.9%)	137 (100%)	
** Statistically Significant; Yates correction done (Fischer Exact test used)					

In the urban elderly participants, association between mental health and age, sex and education was found to be statistically significant. Mental health was found to be more poor for females, illiterates and with increasing age.

Table 45: Association of Mental Health of Rural Elderly with Different Factors

Factors related to Mental Health		Mental Health		Total	P-Value
		Depressed	No Depression		
Age	≤75	10 (7%)	132 (93%)	142 (100%)	0.5401
	75+	4 (12.1%)	29 (87.9%)	33 (100%)	
Sex	Male	4 (4%)	96 (96%)	100 (100%)	0.049**
	Female	10 (13.3%)	65 (86.7%)	75 (100%)	
Education	Illiterates	13 (11.2%)	103 (88.8%)	116 (100%)	0.057
	Literates	1 (1.7%)	58 (98.3%)	59 (100%)	
Socioeconomic Status	Class I&II	3 (4.3%)	66 (95.7%)	69 (100%)	0.2494
	Class III and below	11 (10.4%)	95 (89.6%)	106 (100%)	
Family	Single	12 (75%)	4 (25%)	16 (100%)	0.001**
	Others	2 (1.3%)	157 (98.7%)	159 (100%)	
Habits	No Habits	7 (8%)	80 (92%)	87 (100%)	0.798
	One or More habits	7 (8%)	81 (92%)	88 (100%)	
Chronic Diseases	No chronic disease	0	27 (100%)	27 (100%)	-
	One or more chronic diseases present	14 (9%)	134 (91%)	148 (100%)	
**Statistically significant (Fischer Exact Test applied)					

Among the rural elderly, association between depression and gender, type of family was found to be statistically significant. Depression was found to be more in females and elderly who were single.

Table 46: Association of Quality of Life of Urban Elderly with Different Factors

Factors related to Quality of Life		Quality of Life		Total	P-Value
		Poor	Fair and above		
Age	≤75	3	145	148	0.001**
	75+	6	21	27	
Sex	Male	5	111	116	0.736
	Female	4	55	59	
Education	Illiterates	6	26	32	0.001**
	Literates	3	140	143	
Socioeconomic Status	Class I&II	3	138	141	0.001**
	Class III and below	6	28	34	
Family	Single	4	7	11	0.001**
	Others	5	159	164	
Habits	No Habits	4	78	82	0.846
	One or More habits	5	88	93	
Chronic Diseases	No chronic disease	0	38	38	-
	One or more chronic diseases present	9	128	137	
**Statistically significant (Fischer Exact Test applied)					

Among the urban elderly, association between quality of life and age, education, socioeconomic status, type of family was found to be statistically significant.

It was seen that elderly with more age were having more poor quality of life.

The illiterate elderly were having a poor quality of life compared to the literates.The elderly belonging to upper class and upper middle class were

experiencing a better quality of life compared to the elderly belonging to the lower classes.

The elderly who were staying alone were having a poor quality of life compared to those who were staying in joint or nuclear families.

Table 47: Association of Quality of Life of Rural Elderly with Different Factors

Factors related to Quality of Life		Quality of Life		Total	P-Value
		Poor	Fair and above		
Age	≤75	23	119	142	0.987
	75+	6	27	33	
Sex	Male	12	88	100	0.060
	Female	17	58	75	
Education	Illiterates	27	89	116	0.002**
	Literates	2	57	59	
Socioeconomic Status	Class I&II	1	68	69	0.001**
	Class III and below	28	78	106	
Family	Single	13	3	16	0.001**
	Others	16	143	159	
Habits	No Habits	17	70	87	0.294
	One or More habits	12	76	88	
Chronic Diseases	No chronic disease	1	26	27	0.094
	One or more chronic diseases present	28	120	148	
**Statistically significant (Fischer Exact Test applied)					

Among the rural elderly it was seen that, association between quality of life and education, socioeconomic status, type of family was statistically significant.

The literate elderly were having a better quality of life compared to the illiterates.

The rural elderly belonging to the upper class and upper middle class were experiencing a better quality of life compared to the elderly belonging to the lower classes.

The elderly who were staying alone without any other family member were having a poor quality of life compared to those who were staying in joint or nuclear families.

Discussion

This cross-sectional study was done among the elderly in the age group of 60 years and more in the urban and rural field practice areas of Department of Community Medicine, Shri B.M. Patil Medical College, Hospital and Research Centre, Vijayapura.

Sociodemographic Characteristics of Study Participants

Population Distribution

In this study, out of the 175 urban study population, majority (66%) were males while 34% were females. Among the 175 rural study population, 100(57%) were males whereas, females were 75(43%).

The results were similar to a study conducted by Mishra et. al among the elderly residing in an urban area in Cuttack, Odisha where the males (61%) outnumbered the females(41%).[127]

Similar findings were also seen in a study conducted by Vidyalakshmi et. al among the geriatric population of a rural community in Thiruvallur, Tamil Nadu where males comprised of 55% of the study population while females constituted 45%.[128]

Age Distribution

In this study it was found that among the 350 study population, 57.1% elderly belonged to the age group of 60-69, 32.6% belonged to 70-79 age group while 10.3% of the study participants constituted the 80 and above age group.

Goel P.K. et al, in their study on elderly in Meerut found that 47.2% of the elderly belonged to 60-69 age group, whereas 37.8% and 15% of them belonged to 70-79 and 80 plus age groups respectively. [129]

Leena A et al, found that 73% of the population belonged to the 60-69 age group. [130]

Elango et al, in a study in rural Tamil Nadu found the distribution to be 63.5%, 29.5% and 7% in the three age categories respectively. [131]

The 2011 Census found the Karnataka elderly population age distribution to be 61.8%, 18.3% and 10.8% in the three categories respectively. [132]

Marital Status

In this study it was found that out of the 350 study population, 253(72.3%) were married while 94(26.9%) were widowed and 3(0.8%) were separated. Out of the 94 widowed, 80(85%) were females. This is because in Indian culture most men marry women who are much younger to them; also the life expectancy of women is higher.

In a study done by Vani m. et al, in rural Andhra Pradesh, 72% of the elderly were married while 27% were widowed. (5)

Similar results were seen in a study by Purty et al, in rural Tamil Nadu where, 67.5% of the elderly were married while 32.3% were widowed. (134)

In a study done by Karmakar et al, in a rural setting 75.8% of the elderly participants were married while 24.2% were widowed. (149)

Family

Among the 350 study participants of this study, 253(72.3%) were from joint families, while 70(20%) belonged to nuclear families and 27(7.7%) participants were single.

Leena A. et al, found that joint families (56.8%) were more common among elderly followed by nuclear family system. (130)

The National Sample Survey in the 52nd round found that 86.6% of the Indian geriatric population were a part of either joint or nuclear family. (133) Similar findings were shown by Kant S. et al, in their study. (134)

Saxena et al, in their study of elderly in Uttarakhand found that 71.3% of the study population were part of nuclear family while 28.7% were part of joint family which is in contrast to the findings of this study; which may be due to a difference in setting and area of the studies. [135]

Education

Among the 350 study participants 148(42.3%) were illiterates, while 202(57.7%) were literates.

Illiterates in the rural area comprised of 66.3% of the study population which is similar to the figure of 63% illiteracy in elderly given in the 52nd National Sample Survey. [136] Purty et al, and Anil Jacob found the illiteracy in elderly to be 78% in their studies. [134] Vani M. et al, in their study found the illiteracy to be 58%.[5]

Socioeconomic Status

In this study it was found that out of the 350 study participants, 16.3% belonged to Class I, 43.7% belonged to Class II, 26.6% belonged to Class III, 9.7%

belonged to Class IV and 3.7% belonged to Class V of the Modified B.G. Prasad Classification. This shows a changing trend where the younger generations are improving their family's socioeconomic status through better education and earning capability.

Rahul Prakash et al, in their study found that 24.6% of the elderly belonged to Class III of socioeconomic classification. (137)

Habits

This study showed that among the 350 participants, 51.8% indulged in addictions which included 20.3% smokers, smoking being more common in urban elderly (26.3%). 10.3% of the 350 study subjects were consuming alcohol while 22% were chewing tobacco more so in the rural area(28.6%).

Harshal et al, in their study of elderly in rural Pune found that 38% study subjects were addicted to chewing tobacco, 25% were addicted to alcohol and 34% were addicted to smoking. (150)

Vinod M. et al, in their study in rural Aurangabad found that 68.3% of elderly were addicted which included 29% smokers, 18% alcoholics and 29% tobacco chewers. (151)

Anil Jacob and Purty et al, reported that 33% of their elderly study subjects were smokers while 28% were alcoholics. (134)

Quality of Life

This study revealed that out of the total 350 study participants 10.9% elderly had a poor quality of life which included 5.1% and 16.6% of the urban and rural study population respectively.

50% of the total study subjects had a fair quality of life which included 25.7% and 74.3% of the urban and rural study population respectively.

Out of the total 350 study subjects, 34.3% had a good quality of life which included 60.5% and 8% of the urban and rural study population respectively.

It was also seen that 4.9% of the total study subjects had an excellent quality of life which included 8.6% and 1.1% of the urban and rural study population respectively.

Venu et al, in their study found that 56% of the elderly had good quality of life and 50.8% had an excellent quality of life. [152]

Qadri et al, revealed that 68% of the elderly had a good score while 0.9% had a poor quality of life score. The higher number of elderly having good quality of life maybe due to the fact that these studies were conducted in urban areas of tier one Indian cities. [153]

Chronic Diseases

This study showed that 78% of the urban elderly participants and 85% of the rural elderly suffered from one or more chronic diseases.

Chakrabarty et al, in their study showed that 92.5% of the elderly had one or more chronic diseases. (138)

Cardiovascular System

The prevalence of hypertension in the entire study population was found to be 34.3%. In the urban elderly subjects, it was 36.6% while it was 32% in the rural elderly.

Hanger et al, and Prakash et al in their studies found the prevalence of hypertension to be 43.6% and 48% respectively in their elderly study subjects. (142)

Surekha et al, reported hypertension to be 41.4% in their elderly study participants. (141)

Parray SH et al, reported hypertension to be 58% prevalent. (143)

Swamy HM et al, found hypertension to be 61.3% and 36.7% in the urban and rural elderly respectively. (144)

Anil Jacob and Purti et al, have shown the prevalence of hypertension to be 14%.[134]

Endocrine System

In this study it was found that 25% of the overall study subjects had diabetes mellitus. Diabetes was 28.6% and 21.1% prevalent in the urban and rural elderly study subjects respectively.

Chadha et al, found the prevalence of diabetes to be 17% in their study population.[154]

Deenadayalan et al, in their study of elderly in Tamil Nadu found diabetes to be 26% and 11% prevalent in the urban and rural areas respectively. [139]

Musculoskeletal system

Among the 350 participants in this study majority (47.1%) had complaints of joint pain. While in the urban elderly joint pain was present in 41.7% of the study subjects, in the rural elderly it was 52.6%.

Bhatia SPS reported similar findings that including joint pain, musculoskeletal problems were more in 45.7% of subjects. [140]

Surekha et al reported that musculoskeletal problems were present in 36.8%.[141]

Vision and Hearing

This study's findings showed the overall prevalence of visual impairment in the 350 study subjects to be 27.4%. The causes included mostly cataract and refractive errors in the elderly. Visual impairment was present in 18.3% and 36.6% of the urban and rural study population respectively.

24.6% of the total 350 study subjects suffered from hearing impairment. While it was present in 23.4% of the urban elderly study participants, 25.7% of the rural elderly suffered from hearing impairment in this study.

Rafiq et al, in their study found similar prevalence of vision impairment among the elderly(38.8%). [147]

Zare et al, found the prevalence of hearing impairment to be 12.4% among the elderly in their study. [148]

Dental Problems

Among the 350 study participants, 18.9% of the elderly suffered from dental problems which effected their chewing capability. 14.3% of the urban elderly study subjects were having dental problems while 23.4% of the rural elderly suffered from the same.

Kavita et al, in their study found similar results where 11.6% of the elderly were suffering from dental problems. [110]

Vani Madhavi et al, found 26% of the elderly in their study were having dental problems. [5]

Respiratory System

It was found in this study that 16.6% of the 350 study population suffered from breathlessness. Among the urban elderly 17.7% suffered from respiratory problems including asthma and COPD, while 15.4% of the rural elderly suffered from the same.

Zare et al, in their study found similar results where 15.5% of the elderly were suffering from breathlessness. [148]

BMI

In this study it was found that while 7.7% of the total elderly were underweight, 31.7% were overweight.

Kavita et al, reported similar findings in their study where 11.9% of the elderly were underweight while 37.4% were overweight. [110]

Depression

This study showed that 9.1% of the overall study participants suffered from depression. Depression was present in 10.3% and 8% of the urban and rural elderly study population respectively.

Kavita et al, reported in their study that prevalence of depression was 4% in their study. [110]

Association between age and morbidity

This study revealed that there was statistical significance in the association between age and hypertension, age and joint pain and age and hearing capability

of the elderly participants. It was found all of these morbidities increased with age.

It was found that 86% of the total study population in the age group of 80 years and above suffered from musculoskeletal problems while 28% of the elderly in 70-79 age group suffered from the same.

This study also showed 27.8% of the total participants in age group 80 and above suffered from depression while in the age group 70-79 years, 10.5% suffered from the same.

Similar findings were reported by Surekha Kishore et al, in their study where 51.7% and 90% of elderly in the age group of 70-74 years and 75 years and above suffered from musculoskeletal problems. (141)

Parray S.H. et al, reported similar findings in their study where cataract prevalence increased with age with the elderly in the age group 75-85 years and 85 years and above suffering more. (143)

Association between gender and morbidity

Joint pain was found to be more common among the elderly females (55.2%) compared to the elderly males (42.6%). There was statistical significance in the association between gender and joint pain.

Depression was found to be more among females (16.4% of females) compared to males (4.6%).

Impaired hearing was significantly higher in females of urban area (33.9%) compared to males (18.1%).

The association between gender and depression as well as gender and impaired hearing was found to be statistically significant in this study.

Rahul Prakash et al, in their study reported similar findings where more female elderly (49% of females) suffered from depression compared to males (37.8%).[137]

Swami HM et al, also got similar findings where more elderly females (17.7% of females) suffered from hearing impairment compared to 7.8% of the males. [144]

Association of Socioeconomic status and morbidity

It was found in this study that 78.4% of the urban elderly having joint pain belonged to upper classes (socioeconomic Class I and II).

Among the rural elderly 78.6% of the participants having depression were found to be from lower socioeconomic classes (Class III, IV and V).

In the urban elderly participants, 71.9% of the elderly suffering from impaired vision were found to be from the upper socioeconomic classes (Class I and II).

There was statistical significance found in the association between joint pain and socioeconomic class, depression and socioeconomic class as well as impaired vision and socioeconomic class in this study.

The analysis of Whitehall Study by Marmot and Brumer showed that there was association between higher socioeconomic classes and occurrence of Ischaemic Heart Disease and Diabetes in the elderly. These studies also showed that most morbidities of elderly were distributed in the entire socioeconomic spectrum. (145)

Association of Habits and Morbidity

It was found in this study that 75.8% of the total hypertensives in this study were involved in habits of some kind like smoking, tobacco chewing or alcohol intake.

Among the 350 study participants, 77.6% of the elderly suffering from breathlessness were found to be involved in smoking and other habits.

Among the 175 rural participants, 82.5% of the elderly suffering from dental problems were found to be involved in chewing tobacco, smoking, chewing betel or alcohol intake.

Among the rural participants, 67.6% of the diabetics were involved in smoking, alcohol consumption or other habits.

There was statistical significance found in the association between elderly smokers, tobacco chewers and hypertensives, smokers and elderly suffering from breathlessness, tobacco chewers and elderly suffering from dental problems and between alcoholics and diabetics in this study.

Gaurav RB et al, reported in their study that tobacco chewers have more prolonged elevation in blood pressure just after the use of tobacco. (146)

Mann et al, and Westman also reported similar findings in their study that smoking and chewing tobacco may lead to raised blood pressure.

Rahul Prakash et al, also showed in their study that there was statistical significance in the association between elderly tobacco smokers or tobacco chewers and hypertension. (137)

Summary

-The health status of the geriatric population is a very important component of public health. This is because increase in their life expectancy, especially in India will effect their families, community and nation overall.

-A cross sectional study was carried out in the elderly in the age group 60 years and more in the urban and rural field practice areas of Department of Community Medicine, Shri B.M. Patil Medical College Hospital & Research Centre at Chandabowdi and Ukkali, respectively. A total estimated sample size of 350 was calculated which was divided into 175 each for the urban and rural areas, respectively.

-A preliminary house to house survey to find out the number of people aged above 60 years was done. Systematic random sampling was done to enumerate the number of elderly in the 60 years and above age group and every alternate elderly was included in the study till the sample size was met. A semi structured questionnaire was used to interview the elderly participants.

Objectives

1. To find out the morbidity pattern among the geriatric age group

2. To assess the Quality of Life of the elderly by using the WHO Quality of Life BREF Questionnaire.

3. To study the sociodemographic profile and compare the health profile among the rural and urban elderly population.

Sociodemographic findings

-Among the 350 study population, majority (57.1%) of the elderly belonged to the age group of 60-69. With an increase in age, there was a decrease in the number of elderly in the study participants.

-There were 216 (61.7%) male and 134 (38.3%) female participants in this study.

-Marital status of the elderly study participants showed that 253(72.3%) were married while 94(26.9%) were widowed and 3(0.8%) were separated. Out of the 94 widowed, 80(85%) were females.

-In the study of family composition, it was found that 253(72.3%) were from joint families, while 70(20%) belonged to nuclear families and 27(7.7%) participants were single.

-In the education profile it was found that most participants in the rural area were illiterates (66.3%) while in the urban area majority (80%) were literates.

-In the study of socioeconomic stratification, it was seen that majority (43.7%) belonged to Upper Middle Class (43.7%), followed by (26.6%) Middle Class of Modified B.G. Prasad Classification.

-Diet study showed that 68.3% of the elderly were vegetarians whereas, 31.7% were non-vegetarians.

-Habits study showed that 20.3% of the study participants were smokers, 10.3% were having habit of alcohol intake while 22% were tobacco chewers.

Prevalence of Chronic Diseases and its Associated factors

-The prevalence of hypertension was found to be 34.3% in the study population. It was found to be more (36.6%) in the urban elderly subjects, compared to 32% in the rural elderly. Hypertension was found to be associated with elderly who had addictions like smoking and tobacco chewing and this association was found to be statistically significant.

-Joint pain was found in 47.1% of the participating elderly. While in the urban elderly joint pain was present in 41.7% of the study subjects, in the rural elderly it was more (52.6%).

-The prevalence of diabetes found in this study was 24.6%. It was more (28.6%) in the urban study population compared to rural elderly (21.1%).

-The other common morbidities found in this study were impaired vision (27.4%), impaired hearing (24.6%), breathlessness (15.1%), depression (9.1%), dental problems (17.4%), anaemia (8%), gastritis (6%) and urinary tract infection (4.3%).

-This study revealed that there was statistical significance in the association between age and hypertension, age and joint pain and age and hearing capability of the elderly participants.

-The association between gender and depression as well as gender and impaired hearing were also found to be statistically significant in this study.

-It was also found that there was statistical significance in the association between joint pain and socioeconomic class, depression and socioeconomic class as well as impaired vision and socioeconomic class.

-Statistical significance was also noted in the association between smokers, tobacco chewers and hypertensives, smokers and elderly suffering from

breathlessness, tobacco chewers and elderly suffering from dental problems and between alcoholics and diabetics.

-The study also showed statistical significance in the association between hypertensives and extra salt intake. 86.4% of the elderly taking extra salt in their meals were found to have hypertension.

-It was also seen that there was statistical association between BMI and hypertensives as well as BMI and diabetics in the urban elderly participants. While 53.4% of the overweight elderly(BMI>=25) were having hypertension, it was also noted that 52% of the overweight elderly were having diabetes.

-The association between mental health and sex of the elderly was also found to be significant. 68.8% of the elderly suffering from depression were females.

-This study also showed significant association between Quality of Life and education, Socioeconomic status and type of family. Illiterates (22.3%), elderly belonging to lower socioeconomic class (24.3%) and elderly staying single (63%) were found to have poorer quality of life compared to others.

Conclusion

-This study has shown that there is high prevalence of morbidities in the elderly population and certain factors associated with these has also been identified.

-The prevalence of hypertension in the entire study population was found to be 34.3%. It was found to be more (36.6%) in the urban elderly subjects, compared to 32% in the rural elderly.

-Hypertension was found to be more among the females (37.3%) compared to males (32.4%). Hypertension was found to be associated with elderly who had addictions like smoking and tobacco chewing and this association was statistically significant.

-Joint pain was the most highly prevalent morbidity present in 47.4% of the elderly study participants. It was found to be higher in the rural area (52.6%) compared to the urban area (42.3%).

-Joint pain was more common among the elderly females (55.2%) compared to the elderly males (42.6%). It was more common in the age group of 80 years and above.

-Impaired vision was more prevalent in the rural area (36.6%) than the urban area (18.3%). It was more prevalent among females (32.1%) than males (24.5%).

Impaired hearing was present almost equally in both the study areas (23.4% and

25.7% in urban and rural area respectively). It was higher among females (30.6% of females) compared to males(20.8%).

-A poor quality of life was experienced by 10.9% of the elderly. 50%,34.3% and 4.9% of the study population experienced fair, good and excellent quality of life. The quality of life was better in the urban elderly compared to the rural elderly.

-Depression was present in 9.1% of the elderly study population. It was slightly more prevalent in the urban area (10.3%) compared to rural area (8%). It was also noted that higher number of females (16.4%) were suffering from depression compared to males (4.6% of males).

-Out of the total study population 13.7% were having mild impairment in carrying out their daily activities.

-The prevalence of other morbidities like diabetes, breathlessness, anaemia and gastritis was 24.6%, 15.1%, 8% and 6% of the study participants respectively.

-Associations between smoking and breathlessness, overweight and hypertension, diabetes, hypertension and extra salt intake as well as association between poor mental health or poor quality of life with elderly staying alone were found in this study.

-The present study concludes that health demand in the elderly age group is a priority in Indian scenario both in urban or rural areas due to increase in life

expectancy and growing population of the elderly. Efforts are needed to educate and make these elderly aware about healthy ageing. The health demand can be met by establishing more geriatric health check-up clinics; health education can also be given to elderly regarding lifestyle modifications, both of which can reduce morbidities in the elderly. These interventions along with establishing self-help groups and old age homes for elderly staying alone may overall improve their physical and mental health and ultimately their quality of life.

Recommendations

Considering the observations made during the course of this study and keeping in mind the results and discussions the following points can be recommended.

The Department of Community Medicine, Shri B.M. Patil Medical College, Vijayapura has urban and rural health centres where free health check-up of elderly is done regularly. On these days of checkup, health education sessions pertaining to health of the elderly can be given. If possible, a monthly mental health clinic for the elderly can also be organized at the centres. Also, the health

workers at the centres can visit the elderly at their homes monthly especially those who are unable to visit the centre due to joint pain or immobility.

Health education regarding health promoting behaviour like avoidance of alcohol, smoking and chewing tobacco in order to promote mental and social peace should be given to the elderly. Awareness should also be created in the elderly about the importance of avoiding a sedentary lifestyle, especially among the obese.

Domiciliary care given by specialists who are qualified in geriatric care can be started in rural areas.

Counselling can be done for the caregivers of elderly to understand the importance of healthcare for the elderly.

Healthy public private partnership could be evolved to provide quality healthcare to the elderly.

The primary healthcare system could consider organizing special geriatric clinics once in a week.

Day care hospitals can play an important role in giving close supervision and follow up of geriatric patients with chronic diseases.

Senior citizens clubs can be formed in urban & rural areas through the help of panchayat members. Social workers could help in raising the funds & coordinating different programs like health camps, educational & cultural activities for the elderly at senior citizens clubs.

Promotion of self help groups could be done which could increase social security as well as prevent loneliness among the elderly age group.

Elderly people who have no family support should be provided with old age homes.

Development of national programs on healthy aging, and implementation of the National Policy for the elderly throughout all districts of the country can be done.

For the Individual

Primary Prevention

Bringing about behavioural changes and motivating the elderly to quit their habits through health education sessions can be done.

Educating the elderly about the signs and symptoms of common morbidities and the necessity of their long-term treatment can be done.

Secondary Prevention

The elderly with chronic diseases should be advised to have regular follow up and proper compliance to their medications.

The elderly having hypertension or diabetes can be taught self monitoring of blood pressure and blood sugar levels respectively.

The diabetics can be taught about foot care etc to prevent complications hence stopping progress to tertiary level.

For the Family

Extra care and attention to the elderly can be given in the family.

There should be encouragement of any young responsible member in the family to do follow up with the intake of medications by the elderly suffering from any chronic disease.

The family members should be advised to help the elderly seek medical help whenever required.

The family members should be taught about the signs and symptoms of common geriatric illnesses so that they can be recognised by them early and medical help be sought.

There can be retainment of some of the produce from the field in order to provide a balanced diet to the entire family, in the rural areas.

The elderly should eat their meals along with all other family members with supervision of these meals.

The elderly should be encouraged to do little jobs in and around the house like cleaning, looking after kids, cooking, shopping to make them feel more wanted as well as avoid being sedentary.

The elderly should be encouraged in their family to participate in social functions and gatherings.

For the Community

The geriatric health workers should be taught to identify signs and symptoms of common geriatric illnesses.

Medications needed for the treatment of common geriatric morbidities should be given at subsidized rates at geriatric clinics.

Societies should be promoted to co-operate and help the elderly in need in order to bring about a peaceful and happy life for the elderly.

Strengths of the Study

This study adds to the few existing literature on the morbidities of elderly population and their comparison among the elderlies residing in urban and rural areas, especially in Karnataka.

This study focussed on all the domains of the life of the elderly participants including their socio demographic details, personal habits, recent quality of life, home atmosphere to determine different risk factors rather than assessing only the prevalence of morbidities.

In this study validated questionnaires (Hamilton Mental Health Questionnaire, WHO BREF Questionnaire, Katz Daily Activity Questionnaire) in the local language were used which had good sensitivity and specificity.

Limitations of the Study

Few of the variables analysed in the study were based on the information given by the study participants. So, recall bias and masking of data could be present in the study.

This study being a cross sectional study, only the association of some socio demographic determinants could be shown. The causality of these socio demographic determinants shown could not be proven.

The monthly income of the study participants could not be verified.

Some of the morbidities like asthma, COPD, IHD were accepted based on previous records available.

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ANNEXURE I

PROFORMA

I) Personal Information

Socio-demographic Profile:

i) Name Date

ii) Age

iii) Gender

iv) Religion

v) Married: Yes/No

vi) Address

vii) Family: Single/Nuclear/Joint/Others

No. of members in the family

viii) Socio-economic status

1) Income:

Individual Income Rs._____/ Month (Pensioner/ None / Earning / Dependent)

Total income of the family Rs._____/ Month

Per Capita Income Rs._____/ Month

2) Occupation:

Retirement at the age of_____Years

Still working Yes/No

If yes Type/Duration

3) Education:

Illiterate / Primary / Secondary / College / Graduations / PG

4) Socio-economic class : Modified B.G. Prasad Classification

II) Personal History:

1) Present history of habits: Yes/No

Habits	Type	Amount	Frequency	Duration	If Stopped, Since when
a) Alcohol	Arrack, Beer, Wine, Whisky, Rum				
b) Smoking	Cigarettes, Beedis,Chilum(pipes)				
c) Tobacco Chewing	Paan, Gutka, Betel nut				
d) Any other (drugs etc.)					

If Yes,

2) Past History of habits:

Yes/No

If yes,

Habits	Type	Amount	Frequency	Duration	If Stopped, Since when
a) Alcohol	Arrack, Beer, Wine, Whisky, Rum				
b) Smoking	Cigarettes, Beedis, Chilum(pipes)				
c) Tobacco Chewing	Paan, Gutka, Betel nut				
d) Any other (drugs etc.)					

3) Taking any long-term medications: Yes/No

If yes what?

4) Physical activity:

Yes/No

Type	Duration of Activity/Day	No. of Days/Week
Walking		
Running		
Exercise		
Yoga		
Sports		
Others		

III) Family History:

1) History of Hypertension in the Family : Yes/No

Relative	Y/N	Duration
Father		

Mother		
Others		

2) Any history of Diabetes present in the Family : Yes/No

Relative	Y/N	Duration
Father		
Mother		
Others		

i) Is any other family member smoking at home? Yes/No

IV) Dietary History:

1) Food habits:

Vegetarian/Non-Vegetarian

2) Amount of salt intake/day in grams

3) Extra Salt intake

i) Do you regularly consume pickle/papad/cheese/sauce or any item containing high salt content? Yes/No

4) Per day consumption of

i) Oil:

Type: Refined/ Non refined

ii) Ghee

5) Extra fat intake

i) Do you regularly add visible fat like ghee/butter to chappati and/or other food? Yes/No

V) Psycho-social History:

1) Hamilton Depression Rating Scale

1 DEPRESSED MOOD (sadness, hopeless, helpless, worthless)

(Do you feel old people should not live long?)

0 |__| Absent. 1 |__| These feeling states indicated only on questioning. 2 |__| These feeling states spontaneously reported verbally. 3 |__| Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep. 4 |__| Patient reports virtually only these feeling states in his/her spontaneous verbal and non-verbal communication.

2 FEELINGS OF GUILT 0 |_| Absent. 1 |_| Self reproach, feels he/she has let people down. 2 |__| Ideas of guilt or rumination over past errors or sinful deeds. 3 |_| Present illness is a punishment. Delusions of guilt. 4 |__| Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

3 SUICIDE 0 |__| Absent. 1 |__| Feels life is not worth living. 2 |__| Wishes he/she were dead or any thoughts of possible death to self. 3 |__| Ideas or gestures of suicide. 4 |__| Attempts at suicide (any serious attempt rate 4)

4 INSOMNIA: EARLY IN THE NIGHT 0 |_| No difficulty falling asleep. 1 |__| Complains of occasional difficulty falling asleep, i.e. more than 1⁄2 hour. 2 |__| Complains of nightly difficulty falling asleep. 5 INSOMNIA: MIDDLE OF THE NIGHT 0 |__| No difficulty. 1 |__| Patient complains of being restless and disturbed during the night. 2 |__| Waking during the night – any getting out of bed rates 2 (except for purposes of voiding).

6 INSOMNIA: EARLY HOURS OF THE MORNING 0 |__| No difficulty. 1 |__| Waking in early hours of the morning but goes back to sleep. 2 |__| Unable to fall asleep again if he/she gets out of bed.

7 WORK AND ACTIVITIES 0 |__| No difficulty. 1 |__| Thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies. 2 |__| Loss of interest in activity, hobbies or work – either directly reported by the patient or indirect in listlessness, indecision and vacillation (feels he/she has to push self to work or activities). 3 |__| Decrease in actual time spent in activities or decrease in productivity. Rate 3 if the patient does not spend at least three hours a day in activities (job or hobbies) excluding routine chores. 4 |__| Stopped working because of present illness. Rate 4 if patient engages in no activities except routine chores, or if patient fails to perform routine chores unassisted.

8 RETARDATION (slowness of thought and speech, impaired ability to concentrate, decreased motor activity) 0 |__| Normal speech and thought. 1 |__| Slight retardation during the interview. 2 |__| Obvious retardation during the interview. 3 |__| Interview difficult. 4 |__| Complete stupor.

9 AGITATION 0 |__| None. 1 |__| Fidgetiness. 2 |__| Playing with hands, hair, etc. 3 |__| Moving about, can’t sit still. 4 |__| Hand wringing, nail biting, hair-pulling, biting of lips.

10 ANXIETY PSYCHIC 0 |__| No difficulty. 1 |__| Subjective tension and irritability. 2 |__| Worrying about minor matters. 3 |__| Apprehensive attitude apparent in face or speech. 4 |__| Fears expressed without questioning.

11 ANXIETY SOMATIC (physiological concomitants of anxiety) such as: gastro-intestinal – dry mouth, wind, indigestion, diarrhea, cramps, belching cardio-vascular – palpitations, headaches respiratory – hyperventilation, sighing urinary frequency sweating 0 |__| Absent. 1 |__| Mild. 2 |__| Moderate. 3 |__| Severe. 4 |__| Incapacitating.

12 SOMATIC SYMPTOMS GASTRO-INTESTINAL 0 |__| None. 1 |__| Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen. 2 |__| Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or medication for gastro-intestinal symptoms.

13 GENERAL SOMATIC SYMPTOMS 0 |__| None. 1 |__| Heaviness in limbs, back or head. Backaches, headaches, muscle aches. Loss of energy and fatigability. 2 |__| Any clear-cut symptom rates 2.

14 GENITAL SYMPTOMS (symptoms such as loss of libido, menstrual disturbances) 0 |__| Absent. 1 |__| Mild. 2 |__| Severe.

15 HYPOCHONDRIASIS 0 |__| Not present. 1 |__| Self-absorption (bodily). 2 |__| Preoccupation with health. 3 |__| Frequent complaints, requests for help, etc. 4 |__| Hypochondriacal delusions.

16 LOSS OF WEIGHT (RATE EITHER a OR b) a) According to the b) According to weekly patient: measurements: 0 |__| No weight loss. 0 |__| Less than 1 lb weight loss in week. 1 |__| Probable weight 1 |__| Greater than 1 lb weight loss associated with in week. present illness. 2 |__| Definite (according 2 |__| Greater than 2 lb weight loss to patient) weight in week. loss. 3 |__| Not assessed. 3 |__| Not assessed.

17 INSIGHT 0 |__| Acknowledges being depressed and ill. 1 |__| Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc. 2 |__| Denies being ill at all. Total score: |__|__|

Scoring Method. : a score of 0–7 is generally accepted to be within the normal range (or in clinical remission), while a score of 20 or higher (indicating at least moderate severity) is usually required for entry into a clinical trial.

2) WHO Quality of Life Questionnaire

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one. Please keep in mind your standards, hopes, pleasures and concerns.

The following questions ask about how much you have experienced certain things in the last two weeks.

WHO Quality of Life Questionnaire

		Not at all	A little	A moderate amount	Very much	An extreme amount
1	To what extent do impairments to your senses (e.g. hearing, vision, taste, smell, touch) affect your daily life?	1	2	3	4	5
2	To what extent does loss of, for example, hearing, vision, taste, smell or touch affect your ability to participate in activities?	1	2	3	4	5
3	How much freedom do you have to make your own decisions?	1	2	3	4	5

		Not at all	Slightly	Moderately	Very much	Extremely
4	To what extent do you feel in control of your future?	1	2	3	4	5
5	How much do you feel that the people around you are respectful of your freedom?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	An extreme amount

6	How concerned are you about the way in which you will die?	1	2	3	4	5

		Not at all	Slightly	Moderately	Very much	Extremely
7	How much are you afraid of not being able to control your death?	1	2	3	4	5
8	How scared are you of dying?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	An extreme amount

9	How much do you fear being in pain before you die?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
10	To what extent do problems with your sensory functioning (e.g. hearing, vision, taste, smell, touch) affect your ability to interact with others?	1	2	3	4	5
11	To what extent are you able to do the things you'd like to do?	1	2	3	4	5
12	To what extent are you satisfied with your opportunities to continue achieving in life?	1	2	3	4	5
13	How much do you feel that you have received the recognition you deserve in life?	1	2	3	4	5
14	To what extent do you feel that you have enough to do each day?	1	2	3	4	5

The following questions ask you to say how satisfied, happy or good you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
15	How satisfied are you with what you have achieved in life?	1	2	3	4	5
16	How satisfied are you with the way you use your time?	1	2	3	4	5

17	How satisfied are you with your level of activity?	1	2	3	4	5
18	How satisfied are you with your opportunity to participate in community activities?	1	2	3	4	5

		Very unhappy	unhappy	Neither satisfied nor dissatisfied	satisfied	Very satisfied
19	How happy are you with the things you are able to look forward to?	1	2	3	4	5

		Very poor	poor	Neither poor nor good	good	Very good
20	How would you rate your sensory functioning (e.g. hearing, vision, taste, smell, touch)?	1	2	3	4	5

The following question refer to any intimate relationships that you may have. Please consider these questions with reference to a close partner or other close person with whom you can share intimacy more than with any other person in your life.

		Not at all	A little	A moderate amount	Very much	An extreme amount
21	To what extent do you feel a sense of companionship in your life?	1	2	3	4	5
22	To what extent do you experience love in your life?	1	2	3	4	5

		Not at all	A little	Moderately	Mostly	Completely
23.	To what extent do you have opportunities to love?	1	2	3	4	5
24,	To what extent do you have opportunities to be loved?	1	2	3	4	5

VI) History of Present Illness

1) Acute Illness during past one month Yes/No

a) Complaints if any

1) Duration

2) Treatment taken: Yes/No

3) Recovered: Yes / No

b) Whom she/he consults during illness

Home remedy/Religious/Allopathy/Ayurvedic/Homeopathic/Quacks/Other

2) Chronic Illness Present

If the person is a known Hypertensive (Y/N)	
If Y, Since how long	
Taking regular treatment (Y/N)	

Type of treatment being taken	(Allopathic, Ayurvedic, Herbal,others)
If the person is a known Diabetic (Y/N)	
If Y, Since how long	
Taking regular treatment (Y/N)	
Type of treatment being taken	(Allopathic, Ayurvedic, Herbal,others)

Any other H/O of chronic disease: Yes/No

- If yes type of disease
- If yes treatment takes: Yes/No
- Undergone any operations in the past: Yes/No
    - If yes Type of operation _____

VII) Examination

General Physical Examination

1. Pallor	Present	Absent
2.Oedema	Present	Absent
3. Lymph nodes	Significant	not significant
4. Icterus	Present	Absent
5.Clubbing	Present	Absent
6.Skin disorders (Scabies / Pediculosis / Hypo / Hyper pigmentation)		
7. Eyes (Arcus senalis / cataract if yes mature / immature)		
8.Varicose veins	Yes	No
9.Hernia	Yes	No
10.Haemorrhoids	Yes	No

Sleep: Normal / Disturbed

Bowel habits Regular: Yes / No

Bladder Habits

Micturition:

- Frequency
- Urgency
- Hesitancy
- Dribbling
- Burning micturition

Vital Signs

PR - / min

Ht - cms

BP - mHg

Wt – Kgs

RR - /min

BMI - Kg/m2

Systemic Examination

1. RS

2. CVS

3. GIT

4. Genitourinary

5. CNS

- Special Sense Organs

Hearing – Whispering from behind heard: Y/N

Vision – Counting Fingers

6. Locomotor System

Deformities of back and lower extremities

Scoliosis / Lordosis /Kyphosis: Yes / No

Bursitis: Yes / No

Swelling of joints: Yes / No

Is there any joint plain affecting your mobility: Yes/No

If yes which joint: Ankle/Knee/Hip shoulder/Elbow/Wrist

7. INVESTIGATION

Random blood sugar by glucometer:

Hb investigation by automated haemoglobinometer:

VIII) Katz Activities of Daily Living Scale

Activity	Item	Score
Eating	Eats without assistance	2
	Needs assistance only in cutting meat or buttering bread	1
	Needs assistance in eating or is fed intravenously	0
Dressing	Gets clothes and dresses without assistance	2
	Needs assistance only in typing shoes	1
	Needs assistance in getting clothes or in getting dressed or stays partly or completely undressed	0

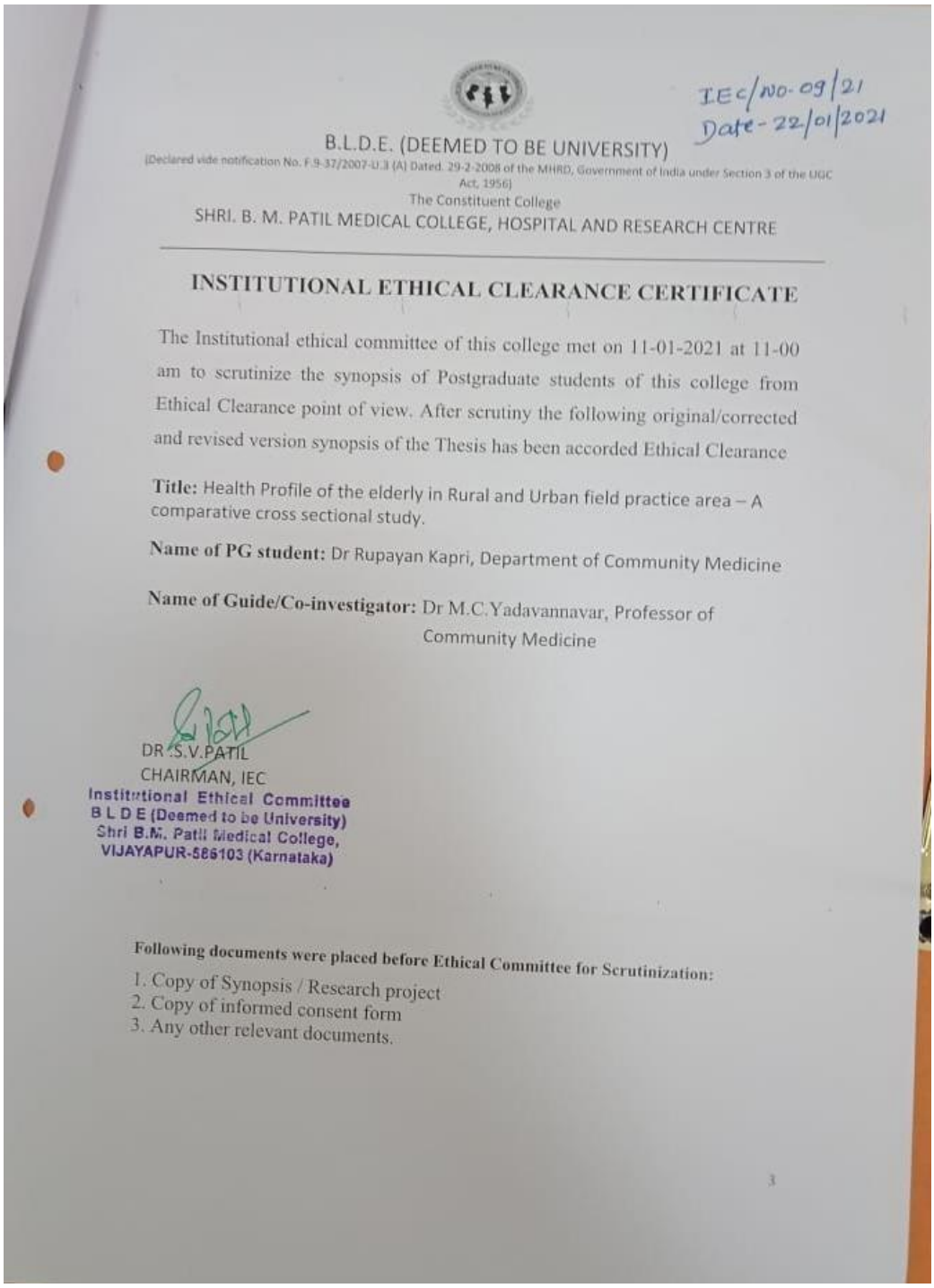
Bathing (Sponge bath, Tub bath, Shower)	Bathes without assistance	2
	Needs assistance only in bathing one part of the body (eg, back)	1
	Needs assistance in bathing more than one part of the body or does not bath	0
Transferring	Moves in and out of bed and chair without assistance (may use cane or walker)	2
	Needs assistance in moving in and out of bed for chair	1
	Does not get out of bed	0
Toileting	Goes to the bathroom, uses toilet, cleans self, arranges clothes, and returns without assistance (may use cane or walker for support and may use bedpan or urinal at night)	2
	Needs assistance in going to the bathroom, using toilet, cleaning self, arranging clothes, or returning	1
	Does not go to the bathroom to relieve bladder or bowel	0

Continence	Control bladder and bowel completely (without occasional accidents)	2
	Occasionally loses control of bladder and bowel	1
	Needs supervision to control bladder or bowel requires use of catheter, or is incontinent	0

Interpretation: A score of 12 indicates complete independence; a score of 6-8 indicates moderate independence and a score of less than 4 indicates severe dependence.

ANNEXURE -II

ETHICAL CLEARANCE CERTIFICATE



IEC/NO-09/21
Date-22/01/2021

B.L.D.E. (DEEMED TO BE UNIVERSITY)
(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)
The Constituent College
SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11-00 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: Health Profile of the elderly in Rural and Urban field practice area – A comparative cross sectional study.

Name of PG student: Dr Rupayan Kapri, Department of Community Medicine

Name of Guide/Co-investigator: Dr M.C.Yadavannavar, Professor of Community Medicine

DR S.V.PATIL
CHAIRMAN, IEC
Institutional Ethical Committee
B L D E (Deemed to be University)
Shri B.M. Patil Medical College,
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

3

ANNEXURE – III

INFORMED CONSENT FORM

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B.M.PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTER, VIJAYAPURA-586103

INFORMED CONSENT FOR PARTICIPATION IN DISSERTATION/RESEARCH

TITLE OF TOPIC : Health Profile of the Elderly in Rural and Urban Field Practice Areas- A Comparative Cross-Sectional Study

GUIDE : Dr. M.C. Yadavannavar

PG STUDENT : Dr. Rupayan Kapri

1. PURPOSE OF RESEARCH

I have been informed that this study will help to assess the Socio demographic, quality of life and morbidity patterns in elderly and educate them regarding health and enable them to seek appropriate medical care in urban and rural field

practice areas of Community Medicine Department of Shri B.M. Patil Medical College, Hospital and Research Centre, Vijayapura. The study is intended to interview the adults aged more than 60 years residing in urban and rural areas of Vijayapura.

2. PROCEDURE

I understand that this is a field based programme. In this procedure I will be asked a series of questions by the researcher regarding the topic.

3. RISK AND DISCOMFORTS:

I understand that I may experience some discomfort during this procedure. This is mainly result of conditions. The procedures of this study are not expected to exaggerate these feelings which are associated with the usual course of study.

4. BENEFITS:

I understand that my participation in the study as one of the study subjects will

help the researcher to assess Socio demographic, Quality of life and morbidity patterns of elderly in age group above 60yrs.

5. CONFIDENTIALITY:

Your answers are kept secret. Your name and contact information will never be identified to anyone outside of the study.

6. REQUEST FOR MORE INFORMATION:

I understand that I may ask more questions about the study at any time to Dr. Rupayan Kapri at the department of community medicine to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of the study, which might influence my continued participation. A copy of this consent form will be given to me to keep for careful reading.

7. REFUSAL OR WITHDRAWAL OF PARTICIPATION:

I understand that my participation is voluntary and that I may refuse to participate, or may withdraw consent and discontinue participation in the study at any time without prejudice. I also understand that Dr. Rupayan Kapri may terminate my participation in the study at any time after he has explained the reasons for doing so.

I have explained to_____(Patient/Relevant guardian) the purpose of the research, procedures required and the possible risk and benefits to the best of my ability.

Investigator:

Date:

I confirm that Dr. Rupayan Kapri has explained to me the purpose of research, the study procedure that I will undergo, and the possible risk and discomforts as well as benefits that I may experience in my own language. I have been explained all the above in detail in my language and understand the same. Therefore, I agree to give consent to participate as a subject in this research project.

Participant: Date:

ANNEXURE-IV

Plagiarism Report

20BMCOM003-RUPAYAN-Health Profile of the Elderly in Rural and Urban Field Practice Areas- A Comparative Cross-Sectional Study

ORIGINALITY REPORT

6%	5%	5%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

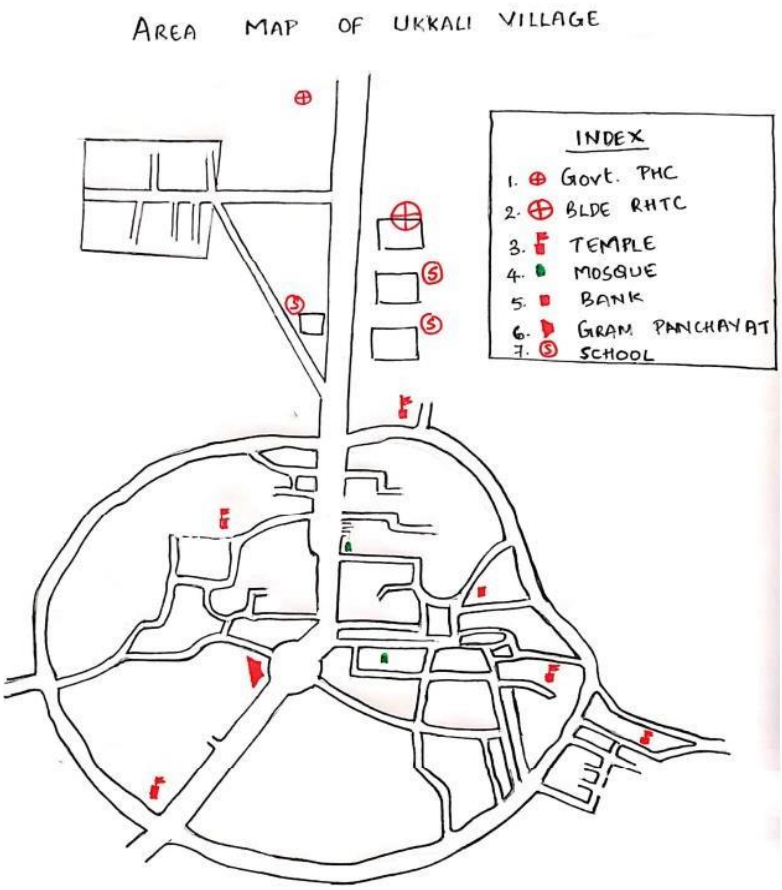
PRIMARY SOURCES

1	www.ejmanager.com Internet Source	1%
2	jamanetwork.com Internet Source	1%
3	www.gerontologyindia.com Internet Source	1%
4	Submitted to (school name not available) Student Paper	1%
5	repository-tnmgrmu.ac.in Internet Source	1%
6	f1000research.com Internet Source	1%
7	www.medicainnovatica.org Internet Source	1%
8	"Ageing Issues in India", Springer Science and Business Media LLC, 2021 Publication	1%

Map of the study area

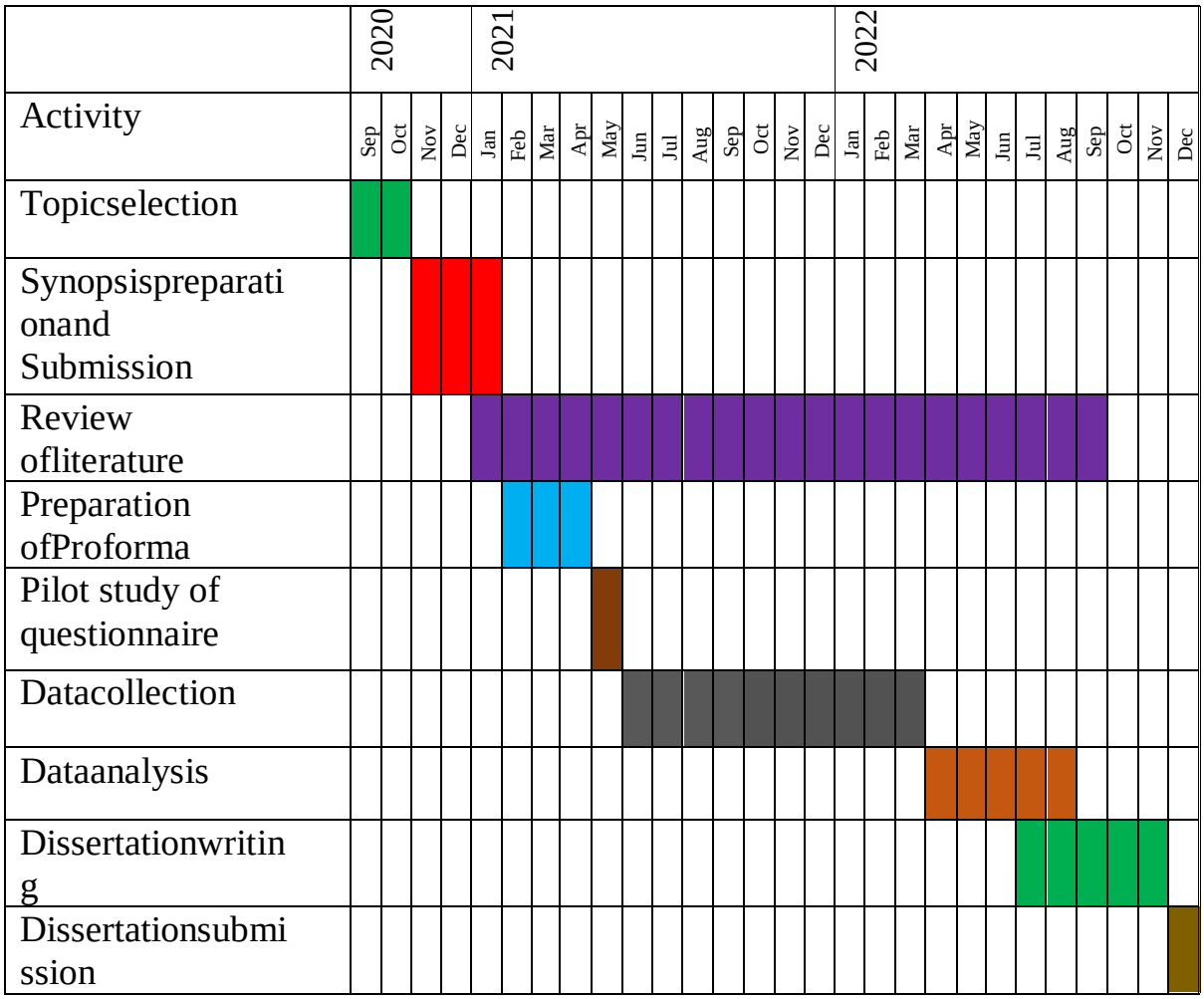
Area Map of Urban Field Practice Area, Chandabowdi

Area Map of Rural Field Practice Area, Ukkali



ANNEXURE V

Gantt Chart



ANNEXURE VI

Photos