PREVALENCE OF FALLS, ITS RISK FACTORS AND IMPACT ON QUALITY OF LIFE AMONG ELDERLY LIVING IN RURAL AREA OF KOLAR

By

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Under the guidance of

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LIST OF ABBREVIATIONS

BKPAI- Building a Knowledge base on population ageing in India

CI -Confidence Interval

DALY-Disability Adjusted Life Years

FOF- Fear of Falling

ICD -International Classification of Disorders

KGF-Kolar Gold Fields

PHC-Primary Health Centre

PPS-Probability Proportionate to size Sampling

PR-Prevalence Ratio

QoL- Quality of Life

RHTC-Rural Health Training Centre

RLJHRC - R L Jalappa Hospital and Research Centre

SAGE- Scientific Advisory Group of Emergencies

SD -Standard deviation

SDUMC - Sri Devaraj Urs Medical College

SES-Socio Economic Status

SPSS -Statistical Package for the Social Sciences

STATA -Software for Statistics and Data Science

SRS- Sample Registration System

UNO- United Nations Organizations

USA- United States of America

WHO -World Health Organization

ABSTRACT

INTRODUCTION

Falls in elderly persons are one of the leading causes of death and a major cause for decrease in the Quality of Life (QoL). It is estimated that about 28%-35% of people aged 65 and above, whereas 32%-42% aged 70 and above fall each year. Quality of Life - is a broad concept covering the individual's physical health, mental state, level of independence, social relationships, spiritual beliefs, and the environment. Information on epidemiology of falls and impact of fall on Quality of Life is (QoL) limited in Kolar area, therefore the present cross-sectional study was conducted.

OBJECTIVES

The study is conducted among the elderly residing in rural area of Kolar.

1. To determine period prevalence of falls.
2. To assess the various sociodemographic and other risk factors that are associated with falls.
3. To study the association of falls with quality of life.

METHODOLOGY

This is a community based, cross sectional study. The study was conducted in Rural Health Training Centre (RHTC), Devarayanasamudra, Department of Community Medicine among the elderly persons aged ≥60 years. The study subjects were selected by probability proportionate to size sampling (PPS). The total sample size was 511. A Pretested semi- structured questionnaire

was used to collect information on sociodemographic characteristics, period prevalence of falls was assessed by asking for history of falls in past 12 months and Quality of Life (QoL) was assessed by WHO QoL- BREF questionnaire.

RESULTS AND INFERENCES

The study found that of 511 participants, females accounted for about 54.8% and most of the study subjects were of 60-69 years age group. Among the participants, 77.3% were illiterates and about 77.2% of the elderly were married. In the past 12 months, the prevalence of falls in elderly persons was 46.8%. It is found that 89.5% of the participants who sustained a fall in last 12 month had high concern for falling. The mean Quality of life scores for all four domains were lower in participants who had fall. Elderly aged 70-79 years and ≥ 80 years females, who had chronic disease and use of walking aid were observed to have association with falls and was statistically significant ($p < 0.005$). Participants who were unmarried/widowed, presence of chronic disease, use of walking aid and with history of fall, were found to have poor quality of life and the association was statistically significant ($p<0.05$).

CONCLUSION

Falls in the elderly is of major concern. This study observed that the falls are associated with poor QoL. Factors influencing falls are modifiable and treatable. Early screening and fall risk

assessment should be included as a routine practice especially in rural areas. Policy makers should evaluate the implementation of successful programmes for the elderly, especially in rural parts of our country to improve their Quality of Life.

KEYWORDS: Elderly, Falls, QoL, Rural, Kolar

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1 INTRODUCTION

Globally, the number of persons aged ≥ 60 years is growing faster than the other age groups. The people in this age group, is estimated to grow to almost two billion by 2050.[1] India houses the world's second largest geriatric population, which is about 1/8th of total geriatric population of the world. About 103.2 million people in India were aged 60 years and above, accounting for about 8.6% of the entire population (As per the Census 2011).[2]

People aged 60 years and above, are most at-risk groups in the society. They face diverse problems in their later lives, such as declining physical functions, increasing disability, chronic illnesses, changes in socio-economic status, social isolation, and neglect.[3-5] Chronic diseases such as diabetes mellitus, coronary heart diseases, osteoporosis, depression, Alzheimer's disease and cerebrovascular disease are most common diseases in elderly people.[6-9] Among many health issues that are faced by the elderly, falls are an important concern. It is well recognized that these factors have a negative impact on Quality of Life (QoL) among elderly.

Elderly are vulnerable to falls because, with ageing normal reactions of a person starts waning. Extrinsic factors include environmental risks due to poor lighting, slipperiness, clutters, unsecured mats, risky behaviors, such as climbing chairs or stairs, and those related to daily activities.[10,11] People aged 60 years and above are more prone to injuries

because of the fragility of organs, and time taken to recover is longer due to the slow recovery process. Falls in elderly are one of the important causes of death. It is also a major cause for decrease in their Quality of Life (QoL).

The frequency of falls increases with age. About 28-35% of people aged 65 and above and 32-42% of the people aged 70 years fall each year.[12] Falls are responsible for 10-15 % of all emergency department visits among elderly. Injuries sustained due to fall are responsible for significant disability and loss of independence. [13,14]

The Quality of life (QoL) is a broad concept covering the individual's physical health, mental state, level of independence, social relationships, spiritual beliefs, and the environment.[15] Inadequate social interactions, educational, poor economic, cultural and health care conditions result in poor quality of life in elderly people.

Information on epidemiology of falls among elderly in the developing countries such as India is limited especially community-based studies in rural settings. Determination of the prevalence of falls, identification of associated factors and quality of life among them will help in understanding the causal factors, and hence planning the preventive measures.

2 OBJECTIVES

The study conducted among the elderly residing in rural area of Kolar.

1.1 To determine period prevalence of falls.

1.2 To assess the various socio-demographic and other risk factors associated with falls.

1.3 To study the association of falls with quality of life.

3 REVIEW OF LITERATURE

3.1 Population Ageing

Ageing is natural human process of growing older, it is multidimensional involving physical, psychological, and social spheres of person's existence.[16]

The term population ageing means it is an inevitable and irreversible demographic reality which is related with improvements in health and medical care. The three demographic components contributing to population ageing are declining fertility, reduction in mortality and increasing survival at older ages, which reflects a shift in age structure from young to old. This demographic transition has resulted in increase in elderly in the population.[17]

World Health Organization (WHO) and United Nations Organizations (UNO) consider a person aged over 65 years as senior citizens.[18,19] According to Government of India, the National Policy on Older persons in 1999 defines senior citizen or elderly as a person aged 60 years and above.[20] World Health Organization classifies elderly age into three different groups young old(60-74years), old old (75-84years) and oldest old (>85years).[21]

a. Global Scenario

The elderly persons are fastest growing segment and constitute 11.5 % of total population globally. By 2050, it is projected that this proportion will increase to 22 %. In the developed

countries, the proportion of the elderly is expected to increase by 31.9 % and in less developed countries, the proportion will be doubled with an increase from 9.9 % to 20.2% by 2050. [22]

b. Indian Scenario

The life expectancy at the age 60 years has increased from 14 years in 1970-1975 to 18 years in 2010-2014, two years longer in women compared to men as per Sample registration system(SRS).[23] In India, the proportion of elderly people is increasing at a rapid pace in the recent years. The population above 60 years is expected to increase from 8% in 2015 to 19 % by 2050. [24]

There is significant interregional and interstate demographic diversity throughout India. This variation is based on stage of demographic transition, ageing and pace of fertility transition. The percentage of elderly people is highest in Kerala constituting about 12.3%, whereas it is relatively high in Himachal Pradesh, Maharashtra, Odisha, and Punjab. The central and northern states such as Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, and Uttarakhand have lower proportion of aged people (Census of India 2011).[25]

3.1.2 Old age dependency ratio

Old age dependency ratio is defined as, the number of persons in the age group 60 or more per 100 people in the age group 15-59years. In India, persons aged ≥ 60 years are generally considered as retired or they withdraw themselves from work and people aged

15-59 years are the working segment of whole population.[25] The overall dependency ratio is 14 elderly per 100 working age population and it varies across the states (as per Census of India 2011). Old age dependency ratio was higher than 15 in Kerala, Goa, Punjab, Himachal Pradesh, Tamil Nadu, Maharashtra, and Andhra Pradesh and on another context, it was lower than 10 in Arunachal Pradesh, Meghalaya, Nagaland, and Chandigarh.[25]

3.1.3 Feminization of Ageing

The sex ratio of elderly, in India has increased from 938 women to 1000 men in 1971 to 1033 in 2011. It is projected to increase to 1060 by 2026, with an insignificant decline in mortality among men especially during old age. The outcome of feminization of ageing is discrimination and neglect that is experienced by women. [23]

3.1.4 Ruralization of Elderly

As per Census of India 2011 about 71% of elderly persons live in rural areas of India. Higher percentage of elderly live in rural areas compared to urban areas of all states of India except Goa and Mizoram. According to Census 2011, poorer states such as Odisha, Bihar and Uttar Pradesh have larger percentage of elderly living in rural areas.[23]

3.1.5 Loss of spouse in Elderly

Loss of spouse in old age has a significant impact in later years. Knowledge regarding

proportion of widows among elderly in the society provides an idea regarding status of older individuals. As per Census of India 2011, nearly 66 % of people aged ≥ 60 years are married, 32 % of them are widows/widowed and nearly 3 % of them are separated or divorced. The distribution of marital status among men is considerably different from women. Majority 82 % of the older men are married as compared to women. The proportion of elderly persons who had lost their spouse is comparatively higher among women compared to men, 48 %, and 15 %, respectively. It is more likely that women are dependent on men financially, therefore loss of spouse among women face many adversities. [25,26]

3.1.6 Living arrangements in Elderly

A few decades ago, living arrangements was not a concern in India, their families were expected to take care of them. Increased life expectancy at old ages has brought about transformation in conventional living arrangements. Majority of elderly are living with children, about one fifth live alone or only with spouse. The proportion of elderly living alone without spouse has steadily increased over a duration of time from 2.4 % in 1992 to 5 % in 2004. In a survey data, Building a Knowledge base on population ageing in India (BKPAI) in 2011 showed that proportion of elderly living alone was highest in Tamil Nadu accounting for 26 %.[27]

3.1.7 Health Status of Elderly:

Chronic diseases are one of the leading causes of death among elderly in India. The

percentage of elderly with chronic disease is estimated to be 41.8% as per Scientific Advisory Group of Emergencies (SAGE) report in 2007. A survey conducted by Building a Knowledge base on population ageing in India (BKPAI) estimated that 64.8 % of the elderly had chronic disease in 2011. The survey found that chronic disease was more among elderly women (674 per 1000) compared to men (619 per 1000). Chronic diseases like arthritis, hypertension, cataract, and diabetes was more widespread among women whereas asthma and heart disease were more among men. [28,29]

3.2.1 Prevalence of falls among elderly

Fall is defined as unintentionally coming to rest on the ground, floor, or other lower level, excluding intentional change in the position to rest.[10] As per International Classification of Diseases, ICD-10 falls are coded as W00-W19. [30] Falls are leading cause of death in older adults. Among various clinical problems faced, falls and instable balance rank high in older adults. They are cause of significant rates of mortality and morbidity also major contributors to immobility.[31] Various reviews and meta analyses have estimated that 30 % of the persons aged 65 years, 50 % of persons aged 85 years and people living in the community will experience fall at least once annually. [32,33]

Falls are of major concern among elderly, resulting in adverse consequences. Falls in elderly are often a result of interacting risk factors. Falls are often manifestation of underlying health conditions. [34] Fear of falling among older adults has an impact on

quality of life by affecting the mobility, sense of wellbeing and it reduces the social interaction. [35,36] Injuries related to falls result in significant disability. It is estimated, falls result in loss of 375 Disability life years per 1,00,000 population in India. [37,38]

3.2.2 Phases of a fall

There are three phases during a fall.[39] In, first phase the initiating agent displaces the body's centre of mass beyond its base of support. Initiating events include both intrinsic and extrinsic factors. Intrinsic factors include unstable joints, muscle weakness and unreliable postural reflexes and physical activities in progress during the time of fall and environmental hazards are the extrinsic factors for a fall. In second phase of fall involves a failure of systems which maintains upright posture to detect and correct this displacement in time to prevent fall. The failure is mainly due to intrinsic factors such as loss of sensory function, impaired central processing, and muscle weakness. The third phase is impact of body on the environmental surfaces, most often floor or ground, that results transmission of forces to body organs and tissues. The potential for injury depends on the magnitude and direction of the forces and susceptibility of tissues and organs to damage. Though, fourth phase is not a part of fall, concerns about psychological, medical and health care are sequelae of falls and attendant injuries. These sequelae effect the degree of damage and disability resulting from falls. Approaches for prevention of falls and their consequences should focus on the factors linked to each of these phases. [40,41]

3.2.3 Pathophysiology of falls:

Fall is a complex multifactorial phenomenon. It is essential to know prerequisites of normal gait to understand the mechanism of falls. The components of normal gait are fine neural networks such as cortical basal ganglia loop and the basal ganglia brainstem system, and appropriately regulated muscle tone of musculoskeletal structures and proper processing of sensory information.[42] Effective coordination of all these components besides adequate cognition and concentration is important to prevent falls and maintain gait. The likelihood of having medical problem increases with advancing age, thus increasing risk for falls. A lot of changes take place in gait with ageing such as decrease in gait velocity and step length, a wider base, and decrease in lower limb length. These changes are more expressed when older people walk on irregular surfaces.[43] Falls usually results from interactions between long term or short-term predisposing factors. [44,45]

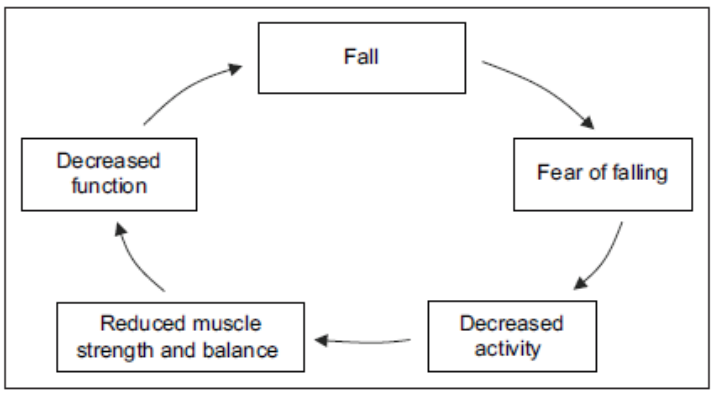


Figure 1: The pathophysiology of a fall

Source: https://www.cfp.ca/content/57/7/771.short

3.2.4 Types of Falls:

Individuals experiences fall for various reasons, if falls are to be prevented, it is important to understand the etiology of a fall.[46] There are variety of causes for a fall, the strategies for preventing falls varies for each type of fall. A fall may be classified as physiological or accidental. Physiological falls are further classified as predictable or anticipated falls and unanticipated falls.

a. Accidental Falls

Fourteen percent of falls are accidental. These falls occur due to an individual slipping, tripping, having some other mishap or mostly due to environmental factors. The environmental factors include unavailability of grab bars, slippery floors due to spilled water. Other factors are inadequate lighting, bed, and toilets of inappropriate height, obstructed walkways, these falls cannot be predicted using any scale as other types of falls. They can be prevented by modification of environment by making it safe for all.[47]

b. Anticipated Falls

Anticipated physiological falls constitute about 78% of all falls. They normally occur if the individual has been identified as fall prone by scoring at risk of falling. Many factors are responsible to cause an anticipated fall. The factors include more than one comorbidity, history of previous fall, impaired gait, lack of realistic assessment of their ability to go to the bathroom unassisted and use of walking aid.[48]

c. Unanticipated Falls

These falls constitute approximately eight percent of all falls. Unanticipated falls may be attributed to physiological causes that cannot be predicted before the fall. A few factors causing unanticipated falls are drop attack or fainting. These falls cannot be predicted using any scale neither they can be prevented. [48,49]

3.2.5 Risk factors

Falls in older adults is multifactorial. They result from convergence of interacting long and short-term predisposing factors, precipitated by an event, often in the environment.[35] The predisposing factors are further classified as intrinsic and extrinsic factors. The intrinsic factors are inherent to the individuals and external factors are environmental hazards and restraints.[50] Falls occur because of a complex interaction between the risk factors. The main risk factors indicate the various health determinants which directly or indirectly affect wellbeing. [30.31] They are categorized in to 4 dimensions: biological, behavioral, environmental, and socioeconomic risk factors.

Model of Risk factors for falls among elderly

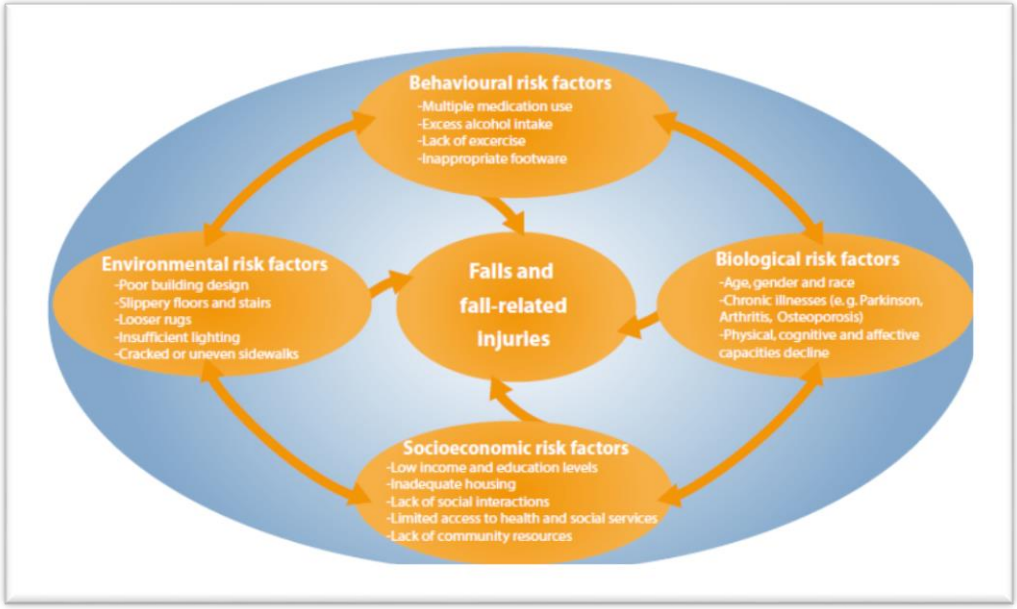


Figure 2: Risk factors and their interaction on falls and fall related injuries.

Source: https://www.who.int/ageing/publications/Falls_prevention7March.pdf

a. Biological factors:

Biological factors comprise of attributes of a person that are concerned to human body. They are age, gender, and race which are non-modifiable risk factors. These are also related with changes occurring due to ageing like decline in physical, cognitive, effective capacities, and the comorbidities. The relationship between biological, behavioral, and environmental factors increases the risk for falling. [51-53]

b. Behavioral Factors:

Behavioral risk factors include those concerned with human activities, emotions, or daily preferences. These factors are modifiable. These factors include multiple intake of medicines, lack of exercise, excess alcohol intake and inappropriate footwear. These

factors can be modified through strategic interventions for bringing about behavioral change. [51-53]

c. Environmental Factors:

It includes the interaction of physical condition of a person and the surrounding environment, which includes hazardous attributes in public environment and home hazards. These factors individually do not predispose to falls, rather the interaction between various other factors are responsible for falls. Home hazards are narrow steps, slippery surfaces of the stairs, looser rugs, and poor lighting. Poor building design uneven sidewalks, and poor lighting in public places are hazards for injurious falls. [51-53]

d. Socioeconomic Factors:

These are the factors which are associated with influence of social and economic status of a person as well as capacity of the community to challenge them. The factors include, poor economic status, illiteracy among people, limited access to the health and social care, especially in remote areas where there is lack of community resources. [51-53]

Figure 3: Various Intrinsic and Extrinsic factors of a fall

Intrinsic factors:

Demographics

1. Advanced age
2. Female

Physical Health

1. Gait and balance impairment
2. Slow gait speed
3. Sarcopenia
4. Frailty

Psychological Health

1. Cognitive impairment
2. Depression
3. Fear of falling
4. Fear of unpredictable space

Sensory impairment

1. Visual impairment
2. Hearing impairment
3. Inappropriate glasses

Cardiovascular factors

1. Arrhythmias
2. Postural hypotension
3. Carotid sinus hypersensitivity

Neurological factors

1. Parkinsonism
2. Peripheral neuropathy
3. Epilepsy, cerebellar disorders
4. Dementia

Drugs

1. Sedatives, Hypnotics, antidepressants
2. Others- Hypoglycemics, drugs causing motor dysfunction

Others

1. Diabetes Mellitus
2. Hypertension
3. Anemia

Extrinsic factors:

Personal care

1. Polypharmacy
2. Inappropriate footwear
3. Bifocals or Multifocal

Environment

1. Inappropriate walking aid
2. Home hazards
3. Outdoor hazards

Social

1. Living alone
2. Sedentary behavior
3. Poor support

Source: https://doi.org/10.1016/j.cger.2017.03.002

3.2.6 Consequences of Falls:

Falls is a public health issue that particularly affects elderly people, resulting in injury, hospitalization, premature death, and impaired mobility. Apart from these factors, loss of independence, loneliness, and fear of falling results in costs to individuals, families, and public.[35]

Falls result in physical consequences which are immediate like bruises, or even more serious fractures. There are secondary consequences which are caused by one being on the ground for a long period. The consequences are psychological social, and economic causing one's quality of life to deteriorate drastically after a fall.[54]

a. Physical Consequences:

The common injuries include fractures, cuts, and bruises. The injuries requiring hospitalization comprise of hip and pelvic fractures. Majority of elderly who have hip fractures recover slowly, even end up in death. A study found that about 80% of elderly women stated that they would wish to die than experiencing loss of independence that affects their quality of life. According to a Canadian survey falls are most common cause of traumatic injuries, accounting for 40 % of hospitalization. This survey reported that approximately 85,000 Canadians 65 years and above has been hospitalized because of injuries resulting from fall.[55]

b. Social Consequences

Fall result in restriction of activities and fear of falling again which is known as Post fall syndrome. This in turn reduces one's quality of life impairing one's self-esteem. Other social consequences may be include moving into residential homes. [55,56]

c. Psychological Consequences

Majority of elderly experience one or more emotional problems following a fall which includes loss of confidence, shame, fear, and anxiety. Individuals suffering from chronic illnesses could cause addictive effects. All these problems collectively lead to dependency which results in lack of enthusiasm. It is observed that about 33% of the elderly experience functional decline after falls. They also experience psychological difficulties that are directly related to falls. Few of them are fear of falling, loss of self-efficacy, avoidance of activity and lack of self-confidence.[57]

d. Costs of Falls

The economic influence of falls is crucial to a family, society, and community. Cost and healthcare impacts of falls in old age is remarkably increasing globally. The mean cost of falls is US$3476 per faller, US$10749 per injurious fall, whereas for hospital admission it is US$26483 per fall.[58] Falls sustained expenditures are categorized into two aspects. They are direct and indirect costs. The Direct costs constitute health care costs like medications and the services. Indirect costs are social productivity losses of affairs in which a person or family care - givers would have involved if he / she had not sustained fall related injuries. [59,60]

In India, about one third of the older adults aged 60 years and above live below poverty line. Approximately 65% of the older adults are economically dependent, especially widowed women. In India, private sector employees do not receive pension and retirement benefits. About only 25% of older individuals have health insurance coverage and medical expenses are predominantly borne out of pocket expenditure. Inadequate income is the major problem faced by older adults in India.[61] Non affordability is one of the causes for not seeking medical treatment among older adults. Fall related injuries affects a person's savings, increases economic burden of caregivers and results in neglect of elderly. [62,63]

e. Mortality in Falls

Falls alone accounts for 40% of all injury deaths. The rates vary depending on the country and the population studied. Fall fatality rate for people aged 65 and older in United States of America (USA) is 36.8 per 1,00,000 population (46.2 in men and 31.1 in women), whereas in Canada the mortality rate was 9.4 per 10,000 population. The mortality rate in Finland, for people aged 50 years and above is 55.4 for men, whereas 43.1 for women per 1,00,000 population.[30]

In India, it is estimated that nearly 1.5 to 2 million of elderly are injured and about 1 million succumb to death every year.[64] Fall associated fatality rates among older adults varied between 53 to 86 % throughout India. According to Sample registration system, in 2011 it is found that deaths resulting from falls among people aged 60 years and above is 65%.[65]

3.2.6 Prevention of Falls:

Falls are emerging as prevalent public health problem. They are potentially predicable and preventable. World Health Organization has designed a comprehensive fall prevention model based on three interrelated and mutually dependent pillars namely – Awareness, Assessment, and Intervention. [30]

Awareness regarding falls is essential for success of fall prevention programmes. In this culturally relevant educational programmes should be incorporated to improve awareness among older adults, their families, and community. These programmes should emphasize on importance of reporting falls and related injuries. Also, they should prioritize about the positive outcomes of interventions, positive self-image, and social participation. [66]

Assessment of fall risk factors is another important strategy to develop effective fall prevention programme. It is the most cost effective and easier strategy rather than treating falls. A comprehensive assessment should be made available at primary healthcare centers for older adults to screen intrinsic factors and to identify older adults at risk of falling. An important aspect of this strategy is assessment of home hazards, especially in an elderly with history of fall. [30,66]

Detailed documentation of fall event, consequent injuries and management is essential. It is important to develop and implement suitable interventions to decrease falls. Effective fall prevention programmes should include assessment with targeted interventions.[66]

Public health policies and strong legislation are required to effectively decrease falls in older adults.[31] Fall prevention should be emphasized in national programmes and in public health policies for elderly persons. It is an emerging problem and a potential barrier to active ageing in India. A coordinated and collaborative efforts of health professionals, researchers, policy makers and systems focusing health care delivery are needed to prevent falls and promote active ageing. [66,67]

3.2.8 Problem Statement of Falls among Elderly – Global

Falls are the second leading cause of mortality worldwide as per World Health Organization. It is estimated that 80% of the falls occurring in low- and middle-income countries, of which South East Asian region account for 60 % of fall related mortalities. Report generated by the WHO has estimated 17 million disability adjusted life years (DALY) lost globally due to fall. Falls alone constitutes for 40 % of all injury related deaths. According to World Health Organization (WHO) among elderly, nearly 37.3 million falls require medical attention per annum, and about 6,46,000 individuals die from falls annually.[68-70] Fall rate increases as age increases, resulting in morbidity, mortality, and loss of independence.[71]

Approximately 28-35% of the individuals aged of ≥ 65 years fall annually, and among older adults aged 70 years it was observed that 32-42% experience fall. [59,72,73] The proportion of falls increases with age and level of frailty. Older people residing in nursing homes fall more frequently than who live in community.

Approximately 30-50% of persons residing in long-term care institutions report fall every year, and recurrent falls among them was 40%. [74]

Among the various studies conducted in other countries (Table A), it is found that the prevalence of falls among elderly varies between 8.2% to 62%.[77-86] Highest prevalence of falls is reported by Mohammed A.E et al in rural areas of Sharkia governorate, Egypt with an overall prevalence of 62%[86], while in other areas studies conducted by Gamage N et al, and Santos F.D et al has observed prevalence of falls to be 34.3% and 27.9% respectively.[79,82] Lowest prevalence of fall was observed in Bharatpur, Nepal (8.2%) by Limbu J et al.[77]

In various studies conducted at urban areas it is found that prevalence of falls is higher among elderly persons. A study by Alshammari S.A et al observed 57.7% prevalence of falls in Riyadh, Saudi Arabia.[85] Similarly, in studies conducted in Riyadh, Saudi Arabia and Dubai prevalence of falls were found to be 49.9% and 50.8% respectively.[83,84] Study by Vieira L.S et al in Pelotas, South Brazil observed that prevalence of fall among elderly was 28.1%.[80] Similarly, Ghazi H.F et al observed that, 30% of the participants reported to have falls in an urban area of Malaysia.[81]

Table 1: Prevalence of Falls among Elderly persons in other countries

SI No.	Authors	Study Place	Rural/Urban	Year of Study	Falls rate
1	Niihata K et al [78]	Japan	Urban	2010	13.9%
2	Santos F.D et al [79]	Pelotas, South Brazil	Rural	2014	27.9%
3	Vieira L.S et al [80]	Pelotas, South Brazil	Urban	2014	28.1%
4	Gamage N et al [82]	Nagoda Division, Galle, Sri Lanka	Rural	2015	34.3%
5	Mohammed A.E et al [86]	Sharkia governorate, Egypt	Rural	2015	62%
6	Almegbel F.Y et al [83]	Riyadh, Saudi Arabia	Urban	2016	49.9%
7	Alshammari S.A et al [85]	Riyadh, Saudi Arabia	Urban	2016	57.7%
8	Ghazi H.F et al [81]	Kuala Lumpur, Malaysia	Urban	2017	30%
9	Sharif S.I et al [84]	Dubai & Sharjah, UAE	Urban	2017	50.8%
10	Limbu J et al [77]	Bharatpur, Nepal	Urban	2019	8.2%

3.2.9 Magnitude of problem in India

The prevalence of falls among elderly persons in India, above the age of 60 years, reported to range between 14%–53 % .[66] It is noted that 28–35 % falls occur among older people aged 65 years and above each year.[30] Out of 424,000 fall related deaths in 2004 globally, one fifth of them took place in India.[75] Around 95,000 death related falls have occurred in India during the year 2004.[76]

Table 2: Prevalence of Falls among Elderly persons in India

SI No.	Authors	Study Place	Rural/Urban	Year of Study	Falls rate
1	Patil S et al	Bangalore	Urban	2010	29.8%
2	Vani C.H et al	Mattikere, Bangalore	Urban	2012	2.3%
3	Sharma P.K et al	Medchal Region, Telangana	Rural	2012	13%
4	Rekha M.R et al	Thiruvananthapuram	Rural	2012	27%
5	Tripathy N.K et al	Chandigarh	Urban & Rural	2012	31%
6	Mane A.B et al	Raichur	Urban	2012	36.8%
7	Srivastava M.R et al	Lucknow	Urban & Rural	2012	66.7% & 55.25%
8	Saikia A.M et al	Guwahati, Assam	Urban	2013	19.5%
9	Agarwalla R et al	Boko-Bongaon, Assam	Rural	2013	41.9%
10	Philip S.A et al	Jabalpur, Ludhiana, Punjab	Urban	2014	28.2%
11	Sirohi A et al	Harayana	Rural	2015	36.6%
12	Dhargave P et al	Bangalore and Maharashtra	Urban	2016	28.9%
13	Venkatesha M et al	Kolar	Urban	2016	42.2%
14	Chacko T.V et al	Coimbatore	Rural	2016	26%
15	Pitchai P et al	Konkan Division, Maharashtra	Urban	2016	24.98%
16	Kaur M et al	Vallah, Amritsar, Punjab	Urban	2017	25.4%
17	Marmamula S et al	Hyderabad	Urban	2017	29.1%
18	Kumar R.S et al	Chennai	Urban	2018	35.5%

Among the various studies in India, it is observed that prevalence of falls among elderly persons varies widely, ranging from 2.3% to 66.7% (Table B).[87-103] Highest prevalence is reported by Srivastava M.R et al, a study conducted in urban and rural areas of Lucknow with an overall prevalence of 66.7% and 55.25% respectively.[103] Similarly, Saikia A.M et al in urban areas of Assam found that the prevalence to be 19.5%, whereas a study by Agarwalla R et al noted the prevalence of falls was 41.9% in rural areas of Assam.[92,102]

The prevalence of falls among elderly persons varied between 2.3% to 29.8% in urban areas of Bangalore,[87-89] and 36.8% in Raichur.[36] In a urban area of Kolar, Venkatesha M et al observed the prevalence of falls among participants to be 42.2%.[90]

Dhargave P et al conducted a study in urban areas of Bangalore, Karnataka and Nagpur, Maharashtra found that the prevalence of falls as 28.9% among the elderly.[88] Similarly, in Konkan division of Maharashtra, Pitchai P et al observed that the prevalence of falls among elderly was 24.98%.[93]

Sirohi A et al observed that prevalence of falls among elderly persons in rural areas of Haryana was found to be 36.6%[101], similar to the observations made by Tripathy N.K et al where the prevalence of falls was 31%.[99] The studies conducted by Kaur M et al and Philip S.A et al in Amritsar and urban areas of Ludhiana, observed that the prevalence of falls among elderly were 25.4% and 28.2% respectively.[94,97]

Studies conducted in Telangana state noted that prevalence of falls varied from 13% to 29.1%. [91,98] In Coimbatore, Chacko T.V et al observed that prevalence among elderly was 26%, whereas a study by Rekha M.R et al observed prevalence of 27% in Thiruvananthapuram and 35.5% in Chennai by Kumar R.S et al. [95,96,100]

a. Age and Gender:

With advancing age, it was noticed that the prevalence of falls was observed to be high. A study conducted by Patil S et al in urban areas of Bangalore, Karnataka and Saikia A.M et al in Guwahati Assam observed that the prevalence of falls was 65.7% and 65.3% among elderly aged 70 years and above respectively [89,92] Similarly Pitchai P et al in urban areas of Konkan division of Maharashtra found that prevalence of falls among people aged 70-79 years was 46.5%.[93] and Philip S.A et al in Punjab observed 46.7%[97], whereas in a study conducted in rural areas of Thiruvananthapuram observed that prevalence of falls among elderly persons above 70 years was 21.3%.[96] Sirohi A et al in rural area of Faridabad, Haryana found the prevalence of falls, as 58% among people aged 80 years and above suggesting increased prevalence with increasing age.[101] A study conducted by Venkatesha M et al in urban areas of Kolar observed that prevalence was 47.4% among people aged 60-65 years [90] Similarly Kumar R.S et al in urban areas of Chennai observed that the prevalence of fall was 35.5%.[100]

Study by Agarwalla A et al in rural areas of Assam observed that prevalence of falls was found to be 55.4% in females.[102] Similarly, in a study conducted by Saikia A.M et al also observed that prevalence was 66.7% among females[92] Chacko T.V et al in

Vedapatti, Coimbatore and Rekha M.R et al in rural areas of Thiruvananthapuram made similar observations of higher prevalence of falls among females compared to males.[95,96] A study conducted in Konkan division of Maharashtra observed that the prevalence of falls among males was 51.4%, higher prevalence as compared to females.[93]

b. Socioeconomic Status, Education and Occupation:

Study by Pitchai S et al and Rekha M.R et al observed the prevalence of falls to be 35.4% and 28% among the elderly belonging to high socioeconomic status, respectively.[93,96] Sirohi A et al in rural area of Ballabgarh block of Faridabad district, Haryana observed that prevalence of falls was 45.5% among people who belonged to Low socioeconomic status.[101]

Studies by Rekha M.R et al and Kumar R.S et al in rural areas of Thiruvananthapuram and urban areas of Chennai, observed that prevalence of falls as 40% and 40.7%, respectively among people who were illiterates.[96,100] In different studies, by Pitchai S et al , Philip S.A et al and Chacko T.V et al observed similar findings that the prevalence of falls among literate people were 27.3%, 28.6% and 27.9% respectively.[93,95,97]

In study by Chacko T.V et al in rural areas of Coimbatore observed that prevalence of falls was 33.9% among people who were employed[95] whereas by Venkatesha M et al in urban areas of Kolar observed that prevalence of falls among unemployed was 55.3% compared to people who were employed 44.7%.[90] Similarly, Philip S.A et al and Kumar R.S et al observed that prevalence of falls among elderly persons to be 30% and 38.1% among unemployed people respectively.[97,100]

c. Marital Status and Type of Family:

Venkatesha M et al observed that prevalence of falls was 36.8% among widow compared to married people[90] which is similar to study by Philip S.A et al , who observed 32.6% of falls in the widow/ widowers[97] whereas studies by Pitchai S et al and Kumar R.S et al observed that prevalence of falls among married people was 64.5% and 37.8% respectively.[93,100] Study by Rekha M.R et al also observed that falls was 27.7% among married people.[96]

Study conducted by Venkatesha M et al in urban areas of Kolar, found that falls was 55.3% among people belonging to Nuclear family compared to 44.7% extended family [90] whereas studies, by Philip S.A et al and Kumar R.S et al observed the prevalence of falls was 30.9% and 38.4% among people belonging to nuclear family respectively.[97,100] Pitchai S et al in Konkan division of Maharashtra, noted that falls was 86.7% among elderly belonging to extended family.[93]

d. Consumption of Alcohol and Tobacco:

In the urban areas of Kolar, Venkatesha M et al, noted that falls was 63.2% among people reported consuming alcohol and tobacco was 5.3% [90] whereas Patil S et al in urban area of Bangalore, observed that falls was 44.3% among people who consumed tobacco compared to 43.1% who reported to consume alcohol[89] which is similar to study by Kumar R.S et al with prevalence of 44.4% among tobacco users.[100] Chacko T.V et al observed that the prevalence of falls was 29.3% among elderly persons who consumed alcohol.[95]

e. Walking Aid:

Patil S et al in urban area of Bangalore, noted that prevalence of falls was 65.7% among people who used walking aid, while the prevalence of falls was 36.4 % among elderly who did not use it [89], whereas Venkatesha M et al and Kumar R.S et al, observed falls was 34.2% and 39.1% among people who used walking aid respectively.[90,100]

f. Chronic Disease:

Patil S et al in urban areas of Bangalore, noted that falls was 48.1% among people who had chronic disease.[89] Similarly studies, conducted by Chacko T.V et al and Kumar R.S et al also found that falls was 35.6% and 41.5% in people who had chronic disease.[95,100] Studies by Rekha M.R et al and Sirohi A et al in rural areas, noted that the prevalence of falls was 30.8% and 25.5% among who had chronic disease.[96,101] Prevalence and falls among elderly varies with medical factors, 28% to 51.9% among Diabetics and 30.7% to 49% in Hypertensives.[89,95,101] The prevalence of falls among elderly varies from 22% to 78.2% with visual impairment whereas in people with hearing impairment it was 8.5% to 54%.[88,91,92,95,101] The prevalence among elderly with osteoarthritis was 31.9% to 69.8% and in people with dizziness it was 18% to 50%.[95,101] The proportion of falls in elderly with cardiac problem was 30.9% to 80.3% and in people with chronic respiratory ailments it was 65.9%.[87,89,101] Elderly with seizure disorder the prevalence of falls was 4% to 50% and with stroke it was 12.9%, whereas for elderly with functional disability the prevalence was 14.1% to 54.1%.[87,91,92,101] Among older adults with complaints of

urgency in micturition had increased rate of falls 58% to 74.4% than those without complaints.[101]

g. Clinical parameters and Falls:

Based on clinical examination parameters, higher percentage of falls was seen with the elderly who had depression 57.4% and impaired cognition 50% to 57.7%.[88,91,101] Falls was noted to be high among elderly obese persons 30.2% to 50% and also in an underweight the proportion was 52.4% to 77.7%.[88,101] In elderly who had abnormal balance the prevalance falls was 23.9% to 61.7% and in persons with abnormal gait prevalence was 51.4% to 80.7%.[87,89,91,101]

h. Fear of Falling and Falls:

Mane A.B et al in urban areas of Raichur, observed that fear of falling was 48.7% who reported to have falls compared to 25.9% persons who did not have fall.[36] In people who had falls about 54.3% of them did not have fear of falling. Rivasi G et al found that fear of falling was 71.4% among people who had fall [104] whereas Pitchai P et al observed that 34.7% of them who had fall reported to have fear of falling. Among people who had fall, 34.3% had low concern, 29.4% had moderate concern and 36.1% had high concern for fear of falling again.[93]

i. Episode of falls:

A study conducted by Sirohi A et al in rural areas of Haryana, observed that majority 77.2% had fallen once, 9.6% had fallen twice and 13.2% of them had fallen thrice.[101] Similarly, Rekha M.R et al observed that 79.6% had fallen once, 12.9% had fallen twice

whereas 7.5% of them had fallen thrice.[96] Studies conducted by Sharma P.K et al and Tripathy N.K et al, majority of them had fallen once 62% and 87% respectively.[91,97] Other studies also observed similar findings, majority of them had fallen at least once.[95,97,100,102]

j. Cause and Type of Injury of Fall:

Rekha M.R et al observed that majority of them sustained falls because of slipping 55.9%, followed by fainted 48.7% and 4.5% reported to have fallen as they lost balance.[96] In a similar study by Pitchai P et al observed that 56.4% of them had fallen due to slipping and 10.7% had fallen due to loss of balance.[93] In a study conducted by Sirohi A et al observed that among people who reported to have fall, most of the elderly sustained 86.7% cuts, abrasions, and bruises.[101] Similarly, in a study by Chacko T.V et al observed that 60.5% of them sustained bruises after fall.[95] In other studies, by Tripathy N.K et al and Agarwalla R et al noted that majority of them sustained fractures 47% and 18% respectively following fall.[97,102]

k. Place and Time of Fall:

Agarwalla R et al observed that 56% of the elderly had fallen outside compared to the falls inside home.[102] In a similar study conducted by Chacko T.V et al, he noticed that 60% of them had fallen outside home.[95] Whereas study conducted by Tripathy N.K et al it was observed that majority of 68% people had fallen inside home.[97] Similarly, in a study by Sirohi A et al it was observed that prevalence of falls inside home was 59.3%.[101]

A study by Rekha M.R et al in rural areas of Thiruvananthapuram, observed that majority 43% of the people had fallen in the morning, followed by 40% of them in the afternoon and 17% of them in the evening.[96] Similarly, study by Chacko T.V et al in rural areas of Coimbatore, observed that 39.1% of them fell in the morning followed by 21.60% in afternoon and 19% of them in evening.[95] Other studies also observed that majority of them had fallen in morning.[93,99] While Sirohi A et al it noted that majority of them had fallen 38.9% in the afternoon.[101]

3.3 Concept of Quality of Life

The phrase "Quality of Life" comprise a complex and multidimensional concept, which is difficult to define, identify, categorize, and analyze. It has a very wide scope and includes various elements, social, cultural, economic, political, and environmental aspects. This concept is of great interest to researchers, academicians, administrators, planners, and government officials. It is one the important and challenging social issues of twenty first century.[105]

3.3.1 Historical Perspective

The work of Seth James probably was the first in the history of development of concept of Quality of Life. He stated that we must not only regard quantity, but also, we should consider quality of life which forms the moral and ethical end. He tried to reflect his idea of both quantity and quality of life should be considered while promoting welfare activities to enhance happiness or quality of life of individual member.[106]

3.3.2 Definition of Quality of Life

"Quality of Life" is defined as the state of life that results from the combination of the complete range of factors such as those determining health, happiness which includes comforts in physical environment and a satisfying occupation, education, social and intellectual attainments, freedom of action, justice and freedom of operation by World Health Organization (WHO).[107]

Quality of Life does not remain same in whole life, it varies from one stage of lifespan to another. It is always influenced by the environment, surrounding conditions or situation in which a person or group of persons live and spend time. Quality of life is considered as a universal concept, which is easily applied a single person or group of persons or people of an area at given point of time. It is normally interpreted as the condition of life of each person or group of people which results from combined effect of several factors which include ecological, demographic, social, cultural, economic, and environmental aspects.[105]

3.3.3 Determinants of Quality of Life

Several studies stressed that health, education, social amenities, poverty plays a significant role in improving the Quality of life. Shookner M et al highlighted few factors which normally affect condition of life. He specified level of income, status in society, supporting system of the society, job opportunity, working culture, environment and social conditions are important determinants of quality of life.[108] Smith A.E et al demonstrated role of determinants in quality of life among people aged more than or

equal to 60 years. He mentioned that sociodemographic characteristics, social support, health, material resources, crime, residential neighborhood, and housing as potential determinants.[109,110] Quality of Life is an outcome of composite value of several attributes which may be related to social and demographic aspects and also objective and subjective aspects. The state and level of life quality differ from one place to another, from one environment to another. It is, therefore, a multidimensional aspect. Several constraints were captured when measuring quality of life. Prutkin J.M et al and Saxena S et al described a few limitations in the way of measuring quality of life. He specified that it was a tough task as it involved several elements during assessment. [111,112]

3.3.4 Quality of Life - Indicator of Health

The concept of Quality of Life in medical sciences is used in context of research for assessing health and non-health related consequences. This helps in understanding the effectiveness of various medical interventions and to evaluate legitimacy of cost effectiveness of the health care system.[107] Various studies using WHO QoL-BREF criteria, it was observed that overall mean score for Quality of Life was 38.9% to 64.52%.[113-116] Occupation, higher income and absence of co-morbidity were found to be the determinants of better Quality of Life score.[115] Quality of Life was relatively low among those with no schooling, nuclear family, not receiving pension, not with partner, having musculoskeletal disorder, low vision.[116]

In a study conducted by Dasgupta A et al in rural areas of West Bengal observed that 62.3% elderly people aged 60 -69 years had poor Quality of Life.[117] In a similar study

conducted by Rajasi R.S et al found that 56.8% of elderly persons aged 60-69 years had poor Quality of Life, followed by 33.1% of elderly persons aged 70-79 years and only 10% of elderly persons aged 80 years and above had poor Quality of Life.[118]

Quality of Life as per four different domains was better among males as compared to females.[113] In study conducted by Dasgupta A et al observed that 61.6% of female had poor Quality of Life as compared to 41% in males.[117]

Quality of Life was relatively low among those with no schooling. [116] A study by Dasgupta A et al observed that 60.8% of illiterates had poor Quality of Life compared to educated people.[117]

Study by Dasgupta A et al in rural areas of West Bengal observed that among working people 35% had poor Quality of Life in comparison with people who were unemployed.[117] In a study by Rajasi R.S et al observed that 90% of the persons who were unemployed had poor Quality of Life compared to employed people.[118]

Rajasi R.S et al in rural areas of Thiruvananthapuram observed that people belonging to low socioeconomic status 65.5% had poor Quality of Life in comparison with people from high socioeconomic status.[118] Similarly, in a study by Dasgupta A et al observed that 56.5% of people from low socioeconomic status had poor Quality of Life.[117]

Quality of Life was relatively low among those with nuclear family. Dasgupta A et al in rural areas of Thiruvananthapuram observed that 95.2% of the people belonging to Nuclear family had poor Quality of Life compared to extended family. [116,117]

A study conducted by Dasgupta A et al in rural areas of West Bengal, observed that people who were widow/widower 73.7% had poor Quality of Life.[117] Similarly, Rajasi R.S et al it was observed that 63.7% of widows had poor Quality of Life, followed by 27.5% among married and 5.6% among unmarried people.[118]

In a study conducted by Dasgupta A et al it was observed that 54.4% of people who reported to consume alcohol had poor Quality of Life compared to people who didn't consume alcohol and 76.6% of people who had comorbidities had poor Quality of Life compared to people who had no comorbidity.[117]

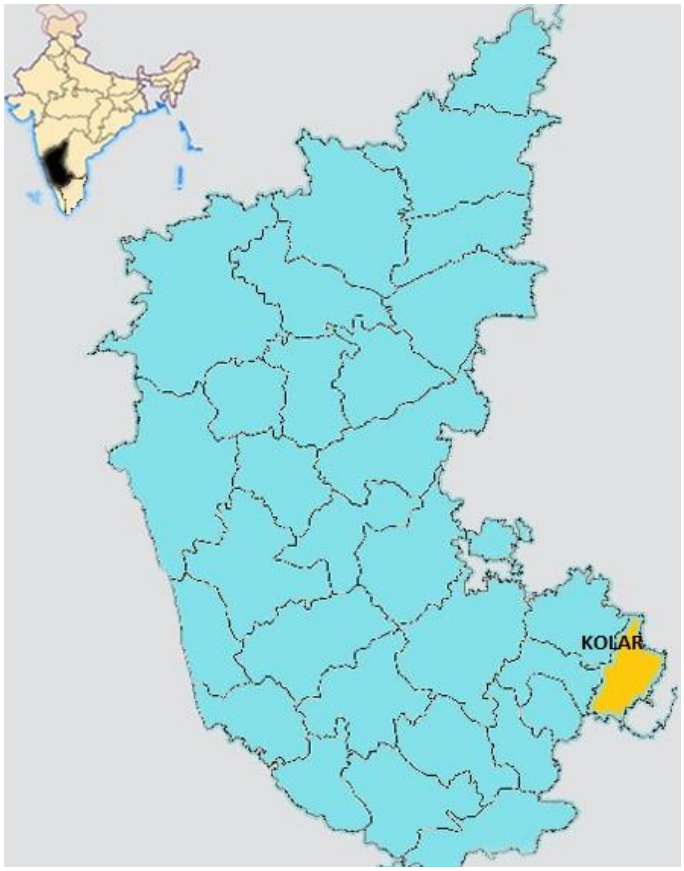
It was found that people with poor visual acuity had less Quality of Life among them and was observed to be associated with falls. Self-reported visual function and vision specific Quality of Life are conventional risk factors for fall among older adults.[78] There is limited literature on association of falls with Quality of Life.

4 MATERIALS AND METHODS

4.1 Study Setting

This study was undertaken in the rural areas of Kolar District. It is situated in southern part of Karnataka state at about 70 kms from Bengaluru. Once famous as one of the largest gold producers in Asia, Kolar is known for silk, milk, and mangoes. It occupies an area of about 4012 sq.km and comprises of total population of 15,40,231 with sex ratio of 976 females per 1000 males. The population of elderly aged ≥ 60 years is 1,54,857, of which 1,11,260 reside in rural areas of Kolar, as per the 2011 census. [119]

Figure 4: Map of Karnataka showing Kolar district



The district includes six Taluks namely Mulbagal, Kolar, Bangarpet, Malur, Srinivaspura and KGF. The effective literacy of the district was 74.33% and female literacy of

66.56%.[119] Most of the people speak Kannada and a notable proportion also speak Telugu in the regions bordered by Andhra Pradesh and Tamil in Kolar Gold Fields (KGF).

This study was conducted in Devarayanasamudra, a Rural Health Training Centre (RHTC), Department of Community Medicine, Sri Devaraj Urs Medical College. Under RHTC there are three subcenters - Devarayanasamudra, Kothamangala and Keeluholalli having 20 villages with a total population of 9846 out of which 1174 people are aged above 60 years.

4.2 Study Population

Elderly population aged 60 years and above residing in Devarayanasamudra Primary Health Centre (PHC) rural field practice area, of Department of Community Medicine, Sri Devaraj Urs Medical College (SDUMC), Kolar.

a. Criteria for inclusion:

1. All elderly persons aged 60 years and above
2. All elderly who were residing in areas of rural health training centre for at least one year

b. Criteria for exclusion:

1. Elderly who were bed ridden
2. Elderly who had been diagnosed with mental illness.

4.3 Sample Size

The Sample size for this study was estimated based upon a survey done on prevalence of falls among elderly people in rural areas of Haryana during the year 2015.[101] The sample size was derived based on self-reported prevalence of falls among elderly which was 36.6 % (p). With 95% confidence interval and with 7% absolute error (d) using the formula $N= (1.96)^2p(1-p)/d^2$ with a design effect of 2 the minimum sample size was estimated to be 364. As the study design includes clusters of villages, all participants in the clusters who were fulfilling the eligibility criteria were included, so the sample size turned out to be 511.

4.4 Sampling procedure

Rural Health Training Centre (RHTC) Devarayanasamudra, has 20 villages with a total population of 9846. These villages were considered as clusters for the study. A total of 9 clusters were selected by Probability proportionate to size sampling (PPS). The list of all elderly people in these selected clusters were obtained from RHTC. All the eligible participants from these clusters were included in this study. Eligible participants were selected from the selected 9 clusters continuously till the required sample size was achieved. Since in the last cluster the sample size of 364 was achieved but the survey was completed by covering the eligibility participants in entire clusters and hence, we ended with a sample size of 511. Households of all the participants were visited and

questionnaire was administered by the investigator. The consent was obtained in a written format from all the study participants.

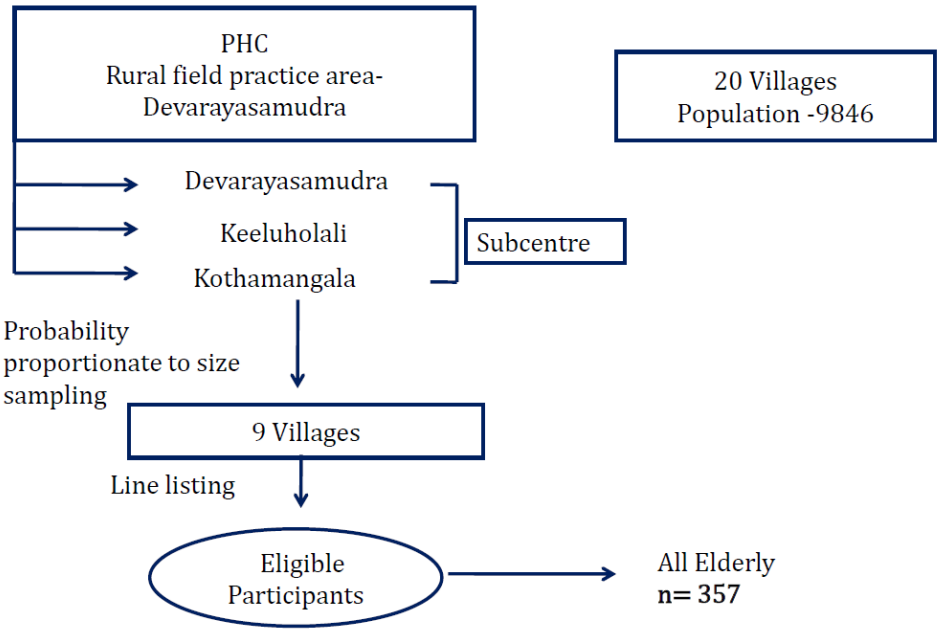


Figure 5: Flow diagram of Sampling

4.5 Study Design and Study Period

This is a community based cross-sectional analytical study. The study was conducted from 1st January 2019 to 31st March 2020.

4.6 Study Tools

4.6.1 Pretested semi structured questionnaire was administered by interview method. The questionnaire was prepared in English, was translated to local language (Kannada) and was pilot tested. The variables collected by interview was basic demographic details namely age, sex, marital status, type of family and caregiver. The occupational history such as present occupation if employed was

asked. The socio-economic status which included number of working members in the family, number of family members in the house and educational status was assessed. Smoking, use of any form of tobacco and alcohol consumption habits, Presence of chronic diseases like Type-II Diabetes Mellitus, Hypertension, Cardiac disease, Bronchial Asthma, Thyroid disorders, Visual and Hearing defects were enquired. History of fall during the previous 12 months period, the time, place of fall and injuries sustained following fall was assessed.

4.6.2 Short Fall Efficacy Scale-I (FES-I) - The Fear of Falling (FOF) among elderly was evaluated by using the Short FES-I. It is a seven-item shortened version of the FES-I.[120] it was developed by Kempen G Yardley in 2008 from the original version FES-I. The scale measures the concern for fear of falling during physical and social activities, both outside and inside the home whether the person does the activity. The level of concern is measured on a four-point Likert scale, 1 - is Not at all concerned, 2 - is Somewhat concerned, 3 – is Fairly concerned, 4 – is Very concerned).

The score of Fear of falling is categorized as:

a. Low: 7-8
b. Moderate:9-13
c. High: 14-28

A score more than 14 will be considered that, person has high concern about falling.

4.6.3 WHO QoL-BREF scale – Quality of Life (QoL) will be assessed by using WHO QoL-BREF questionnaire.[121] This questionnaire contains 24 items of satisfaction with reference to each domain. The domains are physical health, psychological health, social relationship, and environment. In addition to this there are two items that are examined separately. These two questions assess the individual's overall perception of Quality of life and about individual's perception of their health. All the items are rated on five-point Likert scale. In physical domain, seven items are included dependence on medication, energy and fatigue, mobility, pain and discomfort, sleep and rest, activities of daily living and working capacity. The psychological wellbeing domain has six items which include positive feeling, negative feelings, spirituality, thinking, learning, memory and concentration, body image and self-esteem. The social domain has three items, personal relationship, sexual activity, and social support. The environment domain has eight items which includes physical safety and security, physical environment, access to health and social care, financial resources, information, and skills, recreational and leisure, home environment and transport. As per the WHO guidelines, raw scores for every domain will be calculated by adding values of single items and it is then transformed to a score ranging from 0 to 100, where 100 is the highest and 0 is the lowest value.

4.7 Statistical Analysis:

Data collected was coded and was entered using Epidata software. Analysis of that was done using SPSS version 22. and STATA version 12. The summarized data is presented as frequencies and proportions. The association between fear of falling and history of fall was analyzed using Chi square test. The association of Quality of Life (QoL) among elderly who had fall and no fall was tested using independent t-test. Risk analysis for the study outcomes is done using logistic regression analysis and is expressed as Prevalence Ratio with 95% confidence intervals. p value of ≤ 0.05 is considered as statistically significant.

4.8 Ethical Considerations:

This study is approved by the institutional ethical review committee of Sri Devaraj Urs Academy of Higher Education and Research, Kolar. Verbal informed consent was obtained from the subjects and their guardians before the study. Anonymity of the respondents at every stage of data analysis was maintained.

5. RESULTS

A community based cross sectional study was conducted in Devarayanasamudra, PHC, a rural field practice area of Department of Community Medicine, SDUMC. A total of 511 elderly aged 60 years and above was included in the study. The results are as follows.

Age (in years)	Frequency	Percentage
60-69	263	51.5 %
70-79	164	32.1%
80-89	71	13.9%
≥90	13	2.5%

Table 3: Distribution of Elderly according to Age (N=511)

It was observed that, of 511 participants, half of the elderly persons (51.5%) were between age group of 60-65 years, 164 (32.1%) were in the 70 – 79 years age group, while 71 (13.9%) belonged to the age group of 80-89 years and participants aged ≥ 90 years were the least, accounting for 13 (2.5%). The mean(±SD) age of all participants was 70.0 (±7.7) years.

Table 4: Distribution of Elderly according to Sex (N=511)

Sex	Frequency	Percentage
Male	231	45.2%
Female	280	54.8%

It is noted that, out of 511 elderly, 280 (54.8%) of them were females, whereas 231 (45.2%) were males. It was observed that female elderly population was relatively more compared to male.

Table 5: Distribution of Elderly according to Education (N=511)

Education Status	Frequency	Percentage
Illiterate	395	77.3%
Primary	33	6.5%
Secondary	68	13.3%
Higher Secondary	6	1.2%
Bachelors	9	1.8%

It is observed that, majority of the elderly 395 (77.3%) were illiterates, 33 (6.5%) and 68 (13.3%) of them had received primary education and secondary education, respectively. The least education received was higher secondary and bachelors accounting for 6 (1.2%) and 9 (1.8%) respectively.

Table 6: Distribution of Elderly according to Occupation (N=511)

Occupation	Frequency	Percentage
Unemployed	82	16.1%
Homemaker	154	30.1%
Semi-skilled	6	1.2%
Skilled	7	1.4%
Shop owners, Farmers	262	51.3%

It is found that, of 511 elderly majority of them 262 (51.3%) were shop owners and farmers. 154 (30.1%) of them were homemakers and about 82 (16.1%) were unemployed. The least were semi-skilled and skilled workers accounting for 1.2% and 1.4% respectively.

Table 7: Distribution of Elderly according to Marital Status (N=511)

Marital Status	Frequency	Percentage
Married	379	74.2%
Unmarried	4	0.8%
Widow	128	25.0%

It is found that, among 511 participants, 379 (74.2%) of them were married, 128 (25%) of them were widow and 4 (0.8%) of them were unmarried

Table 8: Distribution of Elderly according to Socio-economic Status as per Modified BG Prasad Classification (N=511)

Socioeconomic Status	Frequency	Percentage
Social class Ⅰ (INR ≥7008)	56	11.0%
Social class Ⅱ (INR 3504-7007)	187	36.6%
Social class Ⅲ (INR 2102-3503)	156	30.5%
Social class Ⅳ (INR 1051-2101)	104	20.4%
Social class Ⅴ (INR ≤1050)	8	1.6%

It is observed that, majority of the participants 36.6% of them belonged to lower middle and 30.5% of them to middle class. About 20.4% of the participants belonged to upper middle class, 11% of elderly belonged to upper class whereas only 1.6% of them were in lower class.

Table 9: Distribution of Elderly according to Type of Family (N=511)

Type of Family	Frequency	Percentage
Nuclear Family	200	39.1%
Joint Family	72	14.1%
Three Generation Family	239	46.8%

It was found that majority of the elderly 239 (46.8%) were from three generation family, while 200 (39.1%) belonged to the nuclear family and only 72 (14.1%) of the participants were coming from joint family.

Table 10: Distribution of Elderly according to Chronic disease (N=511)

Chronic disease	Frequency	Percentage
Absent	171	33.5%
Present	340	66.5%

It is observed that, of 511 elderly majority 340 (66.5%) of them reported to have some form of chronic disease.

Table 11: Distribution of Elderly according to Tobacco Consumption (N=511)

Tobacco Consumption	Frequency	Percentage
Absent	212	41.5%
Present	299	58.5%

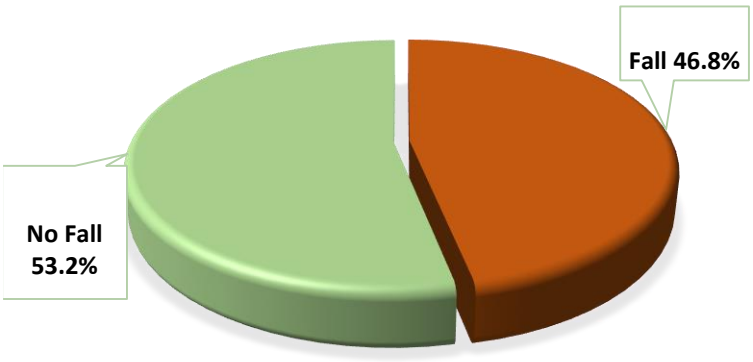
It is found that, about 299 (58.5%) of elderly reported to consume some form of tobacco such as bidi, hukkah, or chewable tobacco.

Table 12: Distribution of Elderly according to Alcohol Consumption (N=511)

Alcohol Consumption	Frequency	Percentage
Absent	492	96.3%
Present	19	3.7%

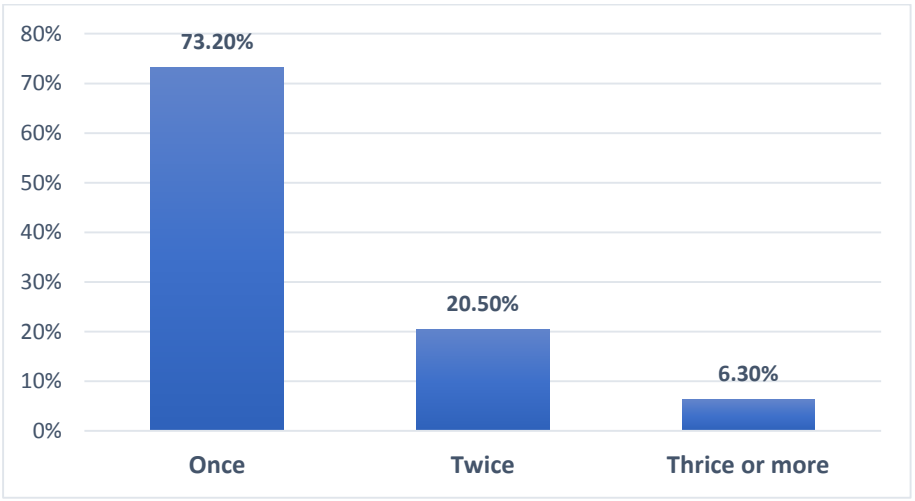
It is observed that, of 511 elderly about 96.3% of them reported of not consuming alcohol whereas only 3.7% of them reported to consume alcohol.

Figure 6: Prevalence of Fall among Elderly (N=511)



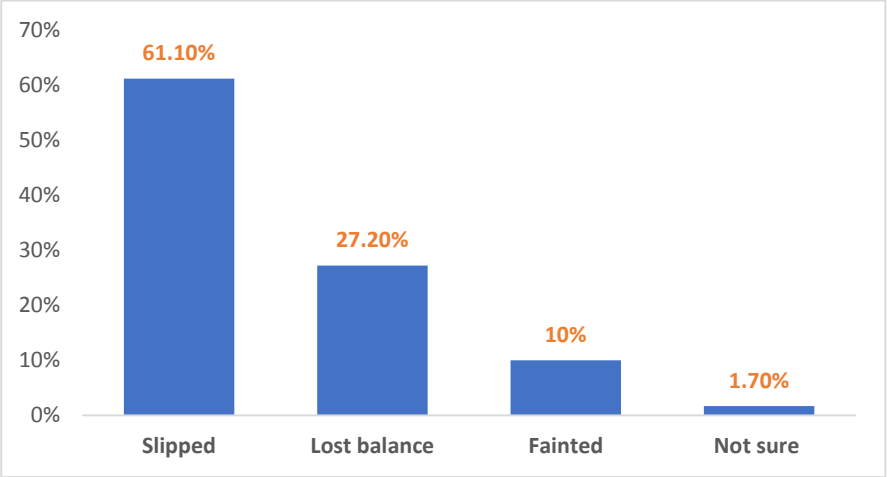
It is observed that, of 511 elderly, the prevalence of falls among elderly in past 12 months was found to be 46.8%.

Figure 7: Prevalence of falls among elderly according to Number of episodes (N=239)



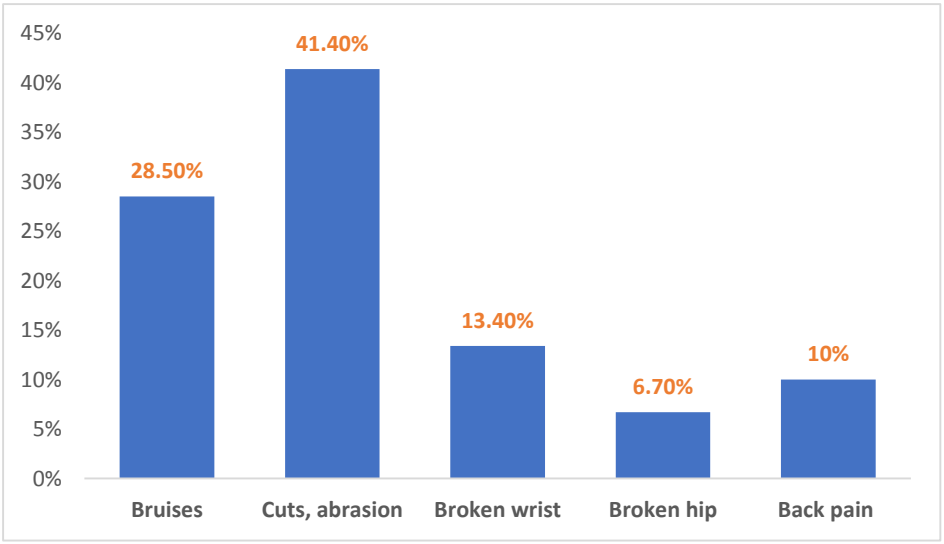
It is found that, of 239 elderly who had fall, majority of them about 73.2% of them had fallen once, while 20.5% of them reported to have fallen twice and 6.3% of the participants had fallen thrice or more.

Figure 8: Distribution of fall among elderly according to precipitating event (N=239)



It is found that, among 146 (61.1%) of individuals the cause of fall was slipping, 65 (27.2%) of them lost balance, while 24 (10%) of them fainted and 4 (1.7%) of them did not remember the cause for fall.

Figure 9: Distribution of fall among elderly according to Type of injury (N=239)



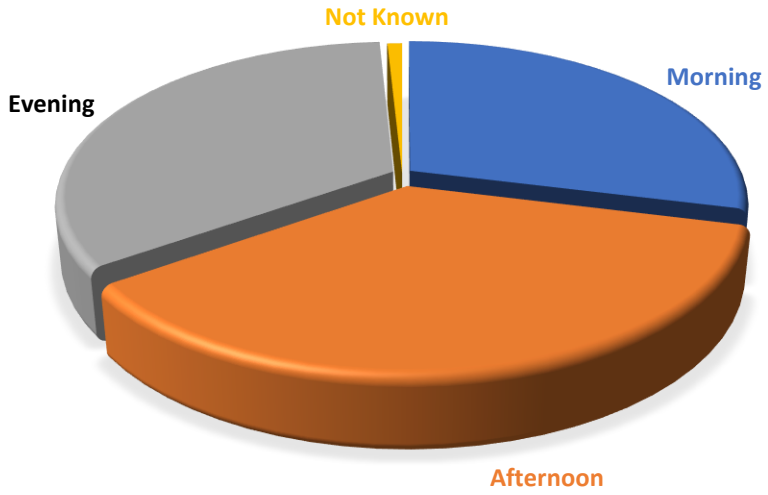
It is observed that, among 239 falls reported by the elders, it was found that all individuals sustained some form of injury. Most common type of injury was cuts and abrasions accounting for 41.4%, about 28.5% of them sustained bruises. 13.4% and 6.7% of reported to sustain broken wrist and broken hip, while 10% of them reported to have backpain following a fall.

Table 13: Distribution of fall among elderly according to the Place of fall (N=239)

Place of Fall	Frequency	Percentage
Home	50	20.9%
Outside	189	79.1%

It is observed that, in majority of the elderly place of fall was outside the home 79.1% and rest of them 20.9% reported to have fallen inside.

Figure 10: Distribution of fall among elderly according to Time of fall



It was observed that, most of the falls 36.4% occurred during the afternoon, while 33.9% occurred in the evening time, whereas 28.9% in the morning and 0.8% of the elderly people were unaware of the time of fall.

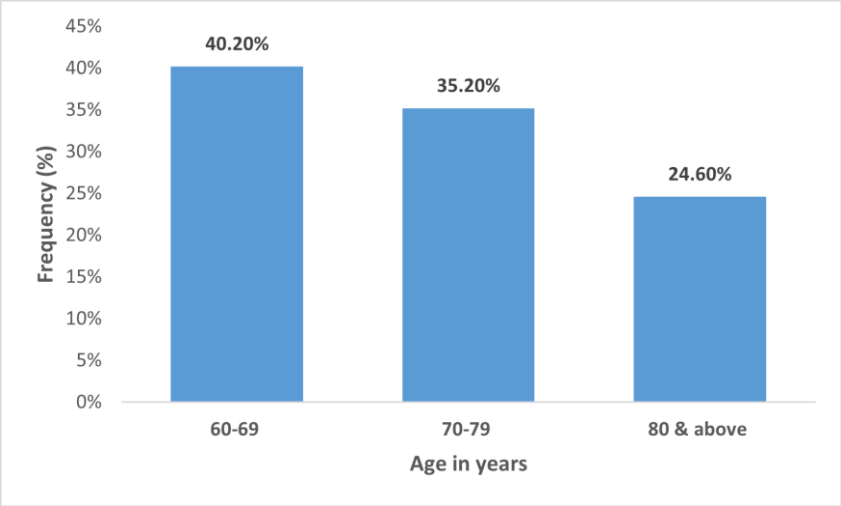
Table 14: Fear of Falling among Elderly using Short Fall Efficacy Scale- I (N=511)

Fear of Falling (FES Scores)	History of Fall		Total n (%)	p Value *
	No Fall n (%)	Had Fall n (%)		
Low (7-8)	130(47.8%)	12(5.0%)	142(27.8%)	<0.001
Moderate (9-13)	23(8.5%)	13(5.4%)	36(7.1%)	
High (14-28)	119(43.8%)	214(89.5%)	333(65.2%)	
Total	272(100.0%)	239(100.0%)	511(100.0%)	

p Value <0.05 significant, *Chi square

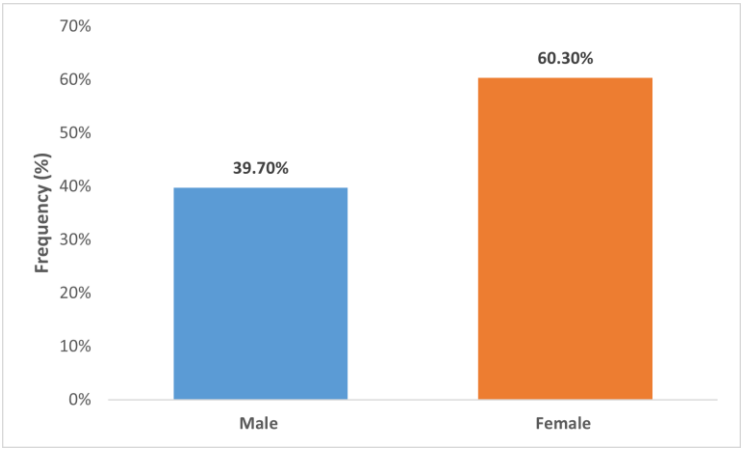
It was observed that Fear of Falling scores were high (14-28) 89.5% among elderly who had fall in past 12 months. Among elderly who reported with no prior history of fall, most of them 47.8% had low Fear of Falling scores (7-8). The association of Fear of Falling with history of falls was studied by applying chi square test. Elderly who had fall in last 12 months showed significant association with Fear of Falling and was statistically significant ($p<0.05$).

Figure 11: Bar diagram showing distribution of Falls among elderly according to Age



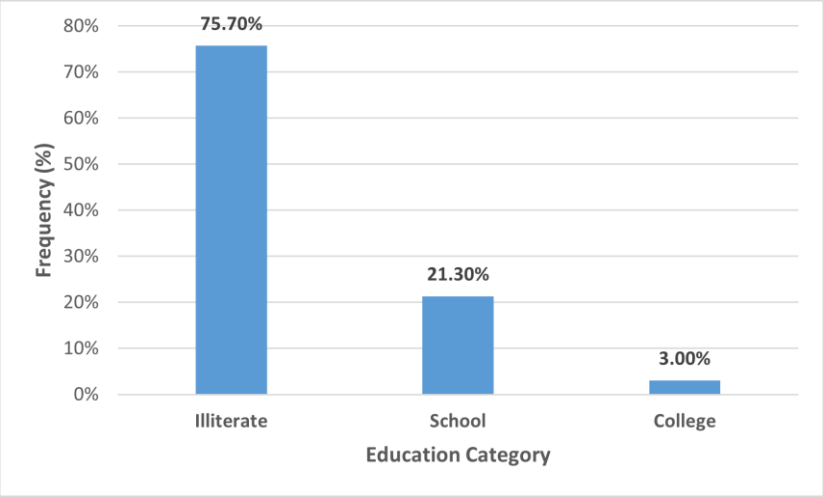
It was found that majority 40.2% of the elderly between the age group 60-69 years had falls, whereas participants aged 70-79 years and 80 -89 years the prevalence of falls was 35.2% and 24.6% respectively.

Figure 12: Bar diagram showing distribution of Falls among elderly according to Sex



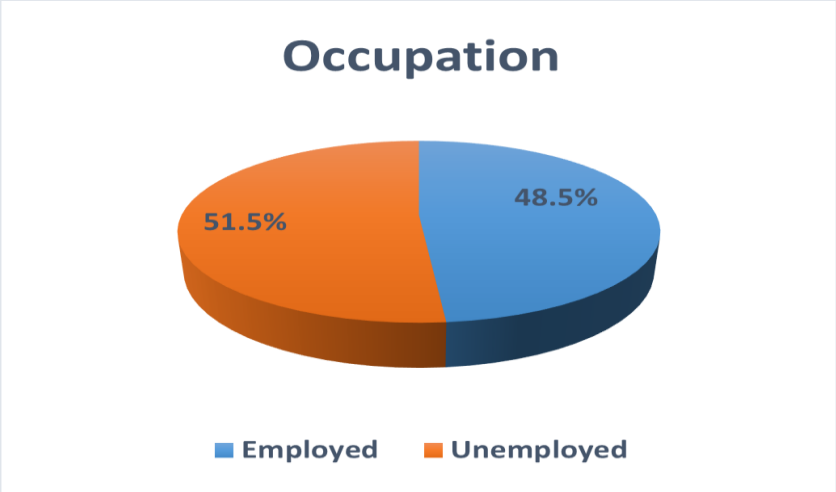
Of 239 participants who had fall, it was found that majority 60.3% of them were females whereas only 39.7% of the participants were males.

Figure 13: Bar diagram showing distribution of Falls among elderly according to Education



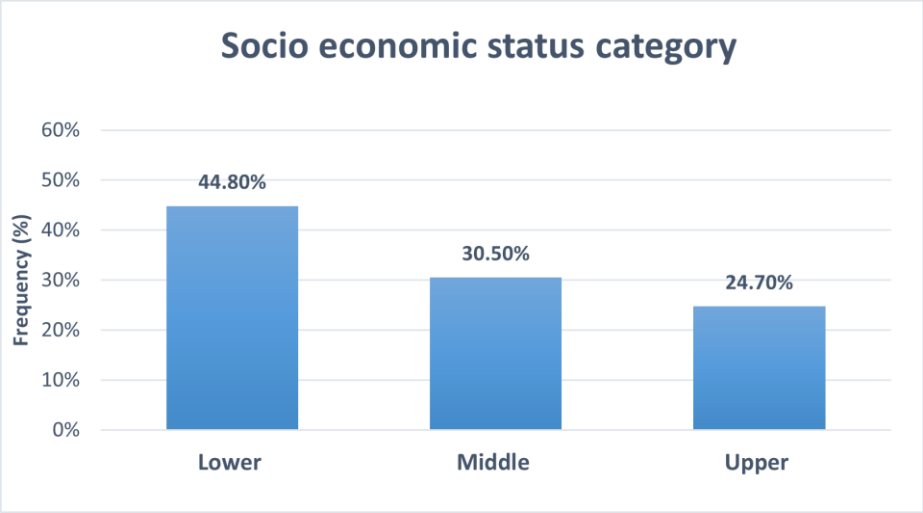
It is observed that 75.7% of the participants who were illiterates had falls, followed by 21.3% of participants who had completed schooling and 3% of the participants who had finished college, had falls.

Figure 14: Pie diagram showing distribution of Falls among elderly according to Occupation



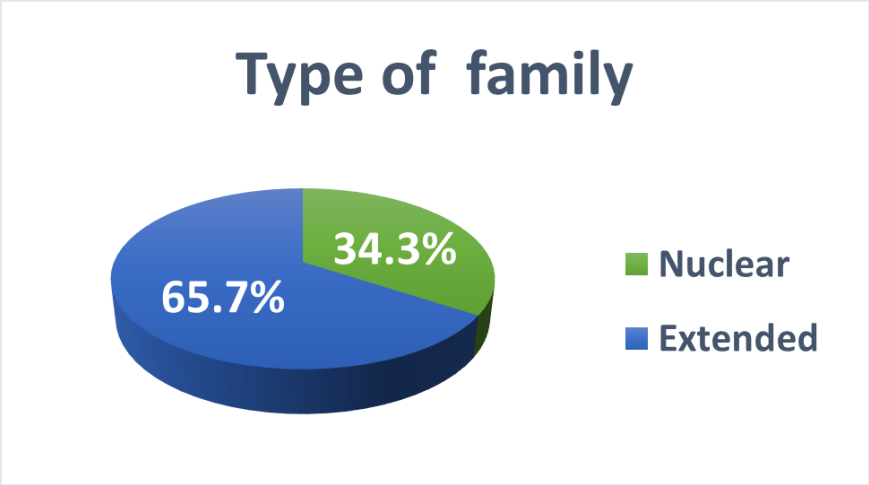
Of 239 participants who had falls, 51.5% of the participants were employed whereas 48.5% were unemployed.

Figure 15: Bar diagram showing distribution of Falls among elderly according to Socio economic status category



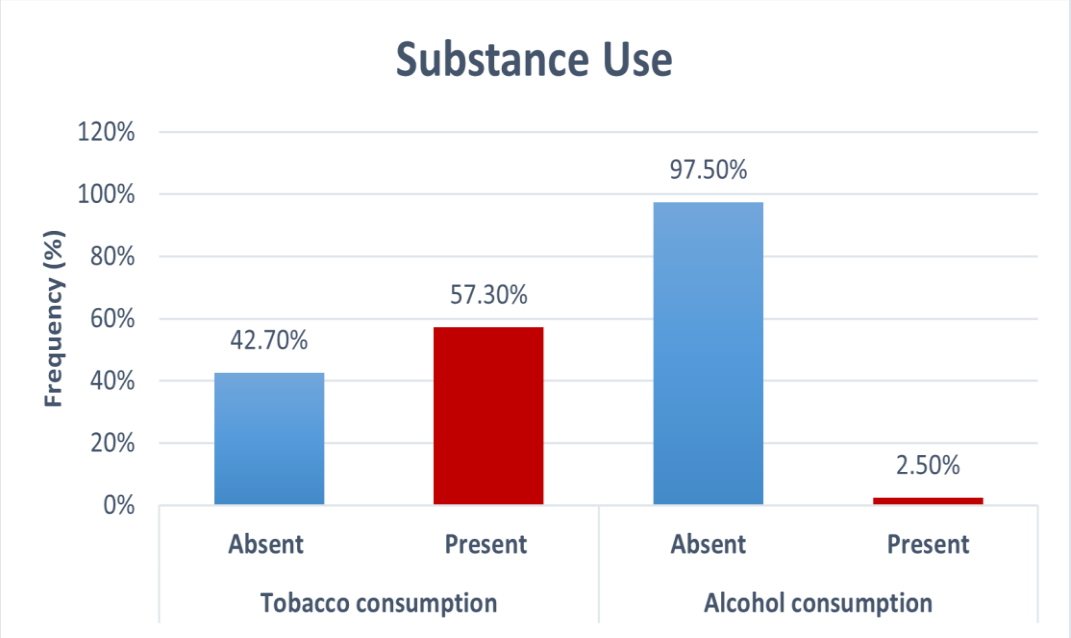
It is found that 44.8% of the participants belonging to lower socioeconomic status had falls. Among the participants belonging to middle and upper socioeconomic status the prevalence of falls was 30.5% and 24.7% respectively.

Figure 16: Pie diagram showing distribution of Falls among elderly according to Type of family



It is found that 65.7% of the participants belonging to extended (three generation & joint) family had falls, whereas 34.3% of the participants belonging to nuclear family had falls.

Figure 17: Bar diagram showing distribution of Falls among elderly according to Substance use



Among study participants who reported to consume tobacco 57.3% had falls whereas the prevalence of falls was 42.7% among people who did not consume tobacco. It is noted that only 2.5% of the participants had falls who reported to consume alcohol whereas majority 97.5% of the persons who had falls did not consume alcohol.

Table 15: Association of Falls with various Socio-demographic Characteristics among elderly (N=511)

Socio-demographic Variables		Number of Elderly (n=511)	Had Fall (n=239) n (%)	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Age	**60-69 years**	263	96(40.2%)	**1**	**1**
	70-79 years	164	84(35.2%)	1.4(1.1-1.7) *	1.3(1.0-1.6) **
	80 years & above	84	59(24.6%)	1.9 (1.6-2.4) *	1.6(1.1-2.2) **
Sex	**Male**	231	95(39.7%)	**1**	**1**
	Female	280	144(60.3%)	1.3(1.0-1.5) *	1.3(1.1-1.6) **
Education	**Illiterate**	388	181(75.7%)	1.0(0.6-1.7)	0.7(0.4-1.5)
	School	108	51(21.3%)	1.0(0.6-1.8)	0.9(0.4-1.9)
	College	15	7(3%)	**1**	**1**
Occupation	**Employed**	275	116(48.5%)	**1**	**1**
	Unemployed	236	123(51.5%)	1.2(1.0-1.5) *	1.1(0.9-1.3)
Socio economic Status (SES)	**Lower**	243	107(44.8%)	**1**	**1**
	Middle	156	73(30.5%)	1.1(0.9-1.3)	1.1(0.9-1.3)
	Upper	112	59(24.7%)	1.2(1.0-1.5)	1.1(0.9-1.4)
Marital Status	**Married**	379	159(66.5%)	**1**	**1**
	Others	132	80(33.5%)	1.4(1.2-1.7) *	0.9(0.8-1.1)
Type of Family	**Nuclear**	200	82(34.3%)	**1**	**1**
	Extended	311	157(65.7%)	1.2(1.0-1.5) *	1.1.(0.9-1.3)
Tobacco Use	**Absent**	212	102(42.7%)	**1**	**1**
	Present	299	137(57.3%)	1.0(0.8-1.1)	0.9(0.7-1.2)
Alcohol Use	**Absent**	492	233(97.5%)	**1**	**1**
	Present	19	06(2.5%)	0.7(0.3-1.3)	0.8(0.4-1.5)
Chronic Disease	**Absent**	171	52(21.8%)	**1**	**1**
	Present	340	187(78.2%)	1.8(1.4-2.3) *	1.7(1.4-2.0) **
Walking Aid	**No walking aid**	436	182(76.2%)	**1**	**1**
	Use of walking aid	75	57(23.8%)	1.8(1.5-2.2) *	1.4(1.2-1.8) **

PR Prevalence Ratio, CI Confidence Interval, * in Unadjusted PR p Value <0.05 Significant, ** in Adjusted PR p Value <0.05 Significant

In univariate analysis, it was observed that prevalence of falls was 35.2% among those aged 70 -79 years (PR=1.4, [95% CI 1.1-1.7]) , followed by people aged between 80 years and above it was 24.6% (PR=1.9, [95%CI 1.6-2.4]) when compared to those aged 60 -69 years where the prevalence of falls was 40.2% and this association was statistically significant.

The female elderly (PR=1.3, [95% CI 1.0-1.5]) presented with higher prevalence of falls almost 1.3 times greater when compared to males and this association was statistically significant. For education, elderly who were illiterates had higher prevalence of falls 75.7% (PR=1.0, [95% CI 0.6-1.7]) and with elderly who had finished schooling the prevalence was 21.3% (PR=1.0, [95% CI 0.6-1.8]) whereas prevalence of falls in elderly who had finished college was 3%.

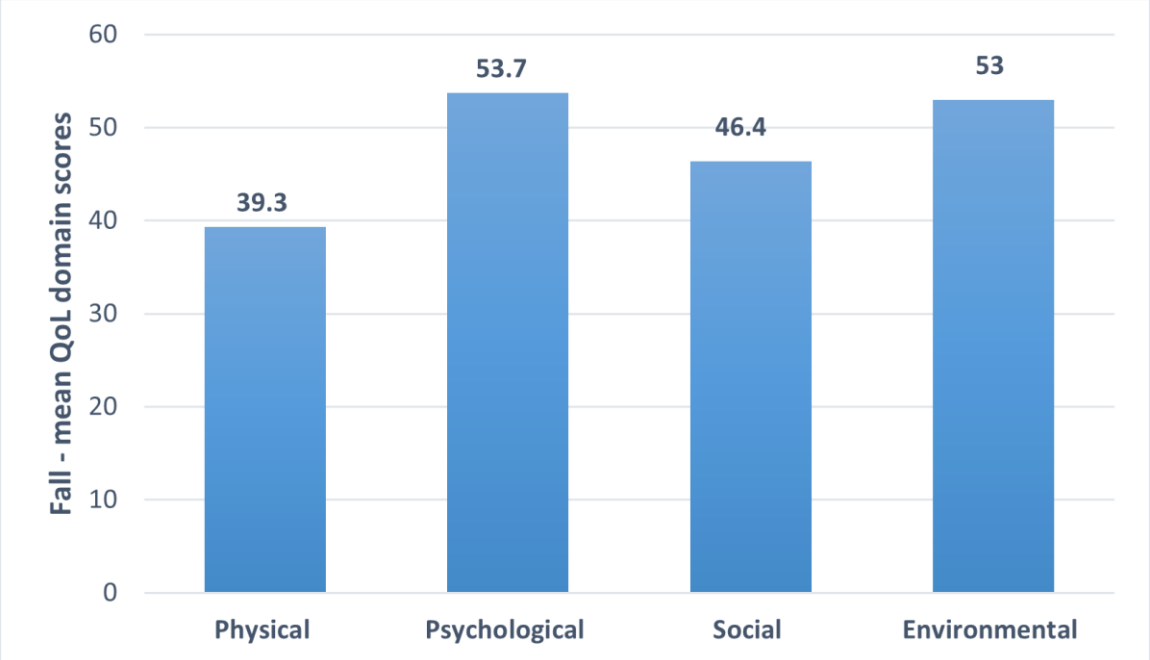
Elderly who were unemployed had higher prevalence (PR=1.2, [95% CI 1.0-1.5]) when compared to persons who were working. Elderly belonging to middle and upper socioeconomic class, the prevalence of falls was 30.5% and 24.7% (PR=1.1, [95% CI 0.9-1.3], PR=1.2, [95% CI 1.0-1.5]) respectively whereas individuals belonging to lower socioeconomic class the prevalence of falls was 44.8% . Among Unmarried and widowed older adults, the prevalence of falls was 33.5% (PR=1.4, [95% CI 1.2-1.7]) whereas prevalence was observed to be 66.5% among married.

Regarding type of family, individuals from three generation and joint family had higher prevalence (PR=1.2, [95% CI 1.0-1.5]) of falls when compared to individuals from nuclear family. The prevalence of falls was 57.3% among elderly who reported to consume tobacco (PR=1.0, [95% CI 0.8-1.1]) compared to people who were not consuming tobacco. In elderly who consumed alcohol the prevalence of falls was 2.5% (PR=0.7, [95% CI 0.3-1.3]) when compared to people not consuming alcohol. The

prevalence of falls was higher among elderly with chronic disease (PR=1.8, [95% CI 1.4-2.3]) when compared to those without chronic disease and the association was statistically significant. It was seen that the use of walking aid (PR=1.8, [95% CI 1.5-2.2]) had 23.8% of prevalence of falls when compared to people who were not using walking aid and was statistically significant. In univariate it was found that age, sex, occupation, marital status, Type of family, Chronic disease and walking aid were associated with falls and were statistically significant ($p<0.05$).

Following univariate analysis, stepwise multi-variable logistic regression was carried out. Participants who were aged 80 years and above, also between 70-79 years were significantly associated with falls. Females were found to have significant association with falls. Participants who had chronic disease had association with falls which was statistically significant. Participants who reported to use walking aid were also associated with falls and was statistically significant ($p<0.05$).

Figure 18: Bar diagram showing distribution of Falls across various domains of Quality of Life



Among participants who had falls the mean Quality of life scores was lower 39.3(±17.6) for physical domain, followed by 46.4(±15.0) in social domain, 53.0(±14.3) in environmental and 53.7 (±16.8) in psychological domain.

Table 16: Association of Falls with QoL among Elderly according to WHO QoL BREF (N=511)

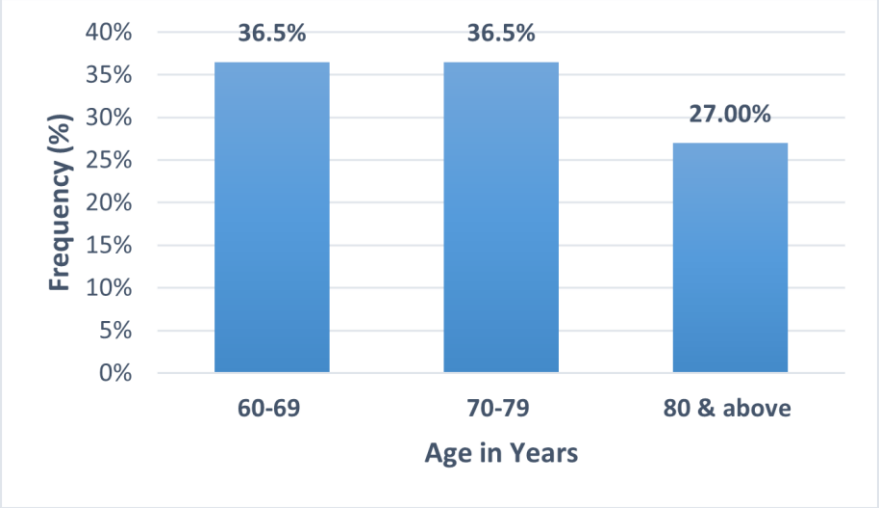
WHO QoL BREF Domains	No Fall (Mean ± SD)	Had Fall (Mean ± SD)	T test Value	p Value^
Physical	56.2(±20.0)	39.3(±17.6)	10.1	<0.001
Psychological	64.2 (±14.6)	53.7 (±16.8)	7.5	<0.001
Social	50.4(±14.3)	46.4(±15.0)	3.1	<0.001
Environmental	59.2(±12.7)	53.0(±14.3)	5.2	<0.001

^ t test, p Value <0.05 Significant, CI Confidence Interval, SD Standard Deviation

It was observed that smong elderly who had no fall, it was observed that highest mean QoL scores was seen in psychological domain 64.2 (±14.6), followed by environmental domain with a mean QoL scores of 59.2(±12.7) and the mean score was 56.2(±20.0) in physical domain. The lowest mean QoL scores was seen in social domain 50.4(±14.3). In elderly who had history of fall it was observed that highest mean QoL scores was observed in psychological and environmental which were similar, 53.7 (±16.8) and 53.0(±14.3) respectively. The lowest mean QoL scores was seen in physical domain 39.3(±17.6) and in social domain with mean scores of 46.4(±15.0). Total mean scores

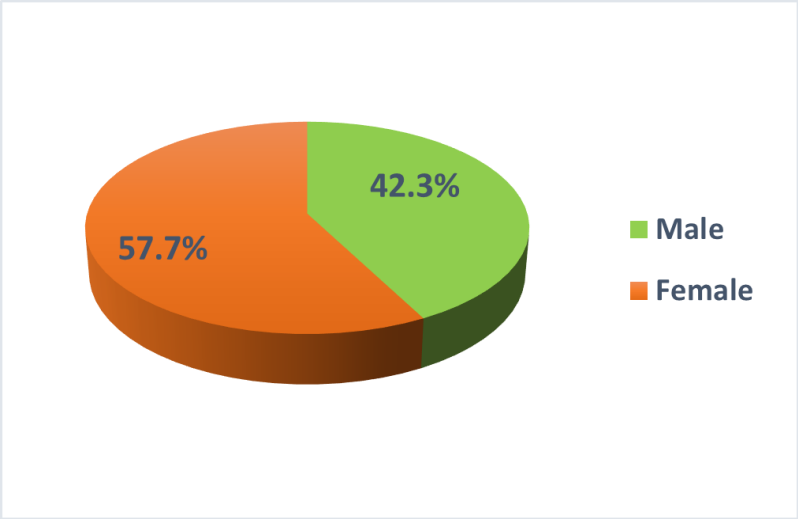
were compared between elderly who had fall and who did not have fall. On analyzing it was observed that the total mean scores were better in elderly who reported to have no history of fall. In elderly who reported to have fall comparatively had lower total mean scores. Comparing the scores obtained in psychological domain it was lower in elderly who had fall and this association was statistically significant. In individuals who had fall it was seen that environmental, social, and physical domains were significant lower mean scores compared to individuals who had no fall. All these differences in mean QoL scores between participants with fall and without fall was found to be statistically significant (<0.001).

Figure 19: Bar diagram showing distribution of Poor Quality of life among elderly according to Age



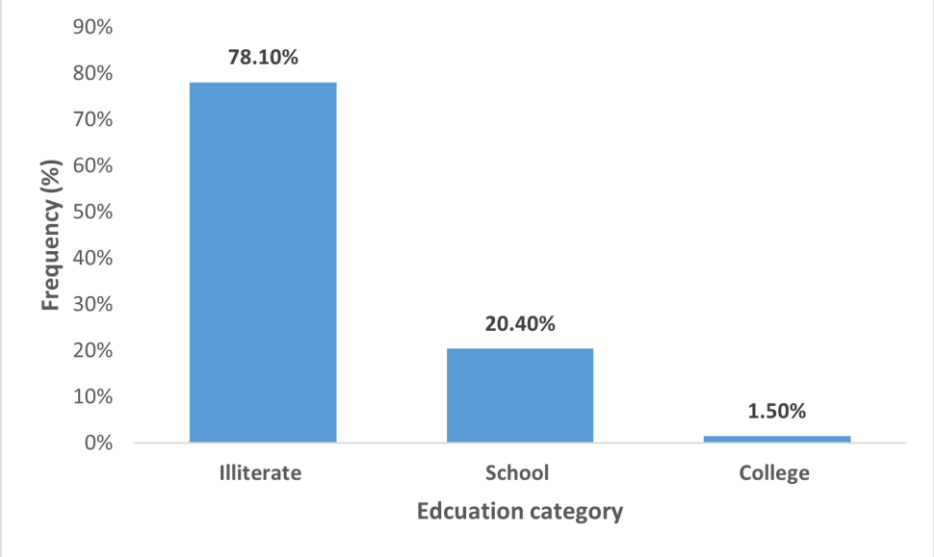
It was observed that people aged 60-69 years and 70-79 years, 36.5% of them in both the groups had poor quality of life. In participants who were 80 years and above about 27% of them had poor quality of life.

Figure 20: Pie diagram showing distribution of Poor Quality of life among elderly according to Sex



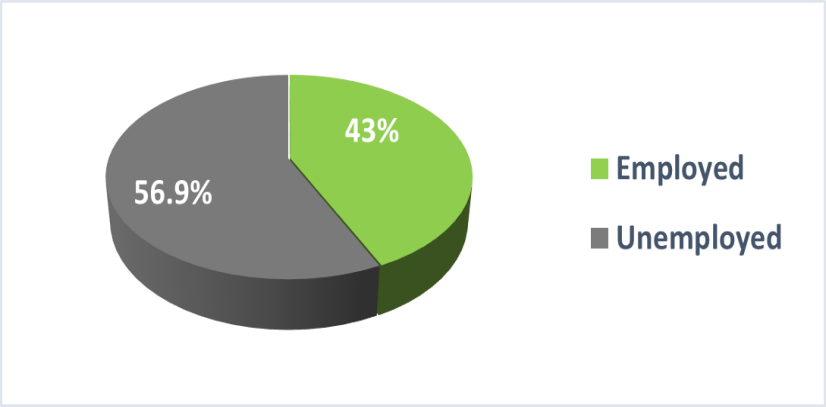
It was found that among 137 participants who had poor quality of life, 57.7% were females whereas 42.3% of them were males.

Figure 21: Bar diagram showing distribution of Poor Quality of life among elderly according to Education



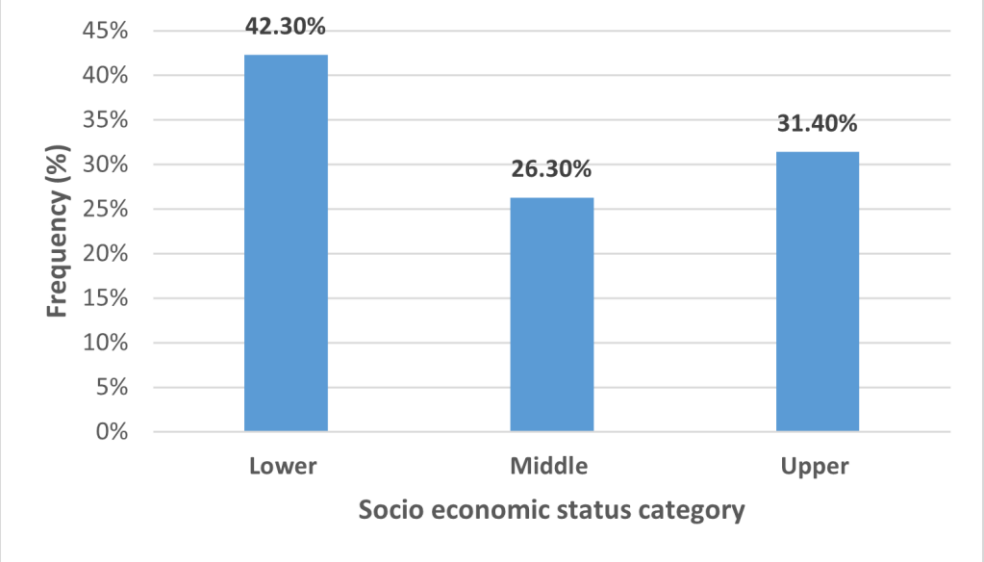
It is observed that 78.1% of the participants who were illiterates had poor quality of life, whereas 20.4% and 1.5% of the participants who had completed schooling and college had poor quality of life, respectively.

Figure 22: Pie diagram showing distribution of Poor Quality of life among elderly according to Occupation



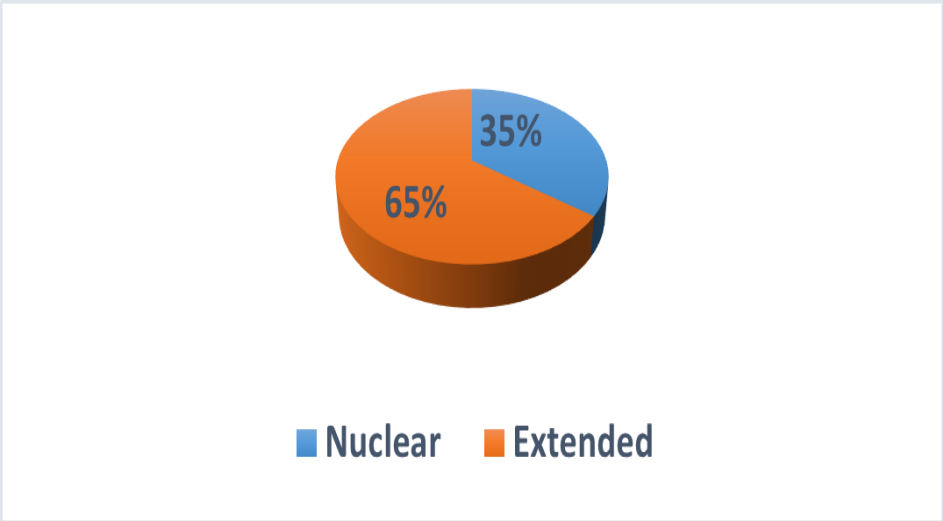
It was found that 56.9% participants who were unemployed had poor quality of life whereas 43% of the people who were employed had poor quality of life.

Figure 23: Distribution of Poor Quality of life among elderly according to Socioeconomic status category



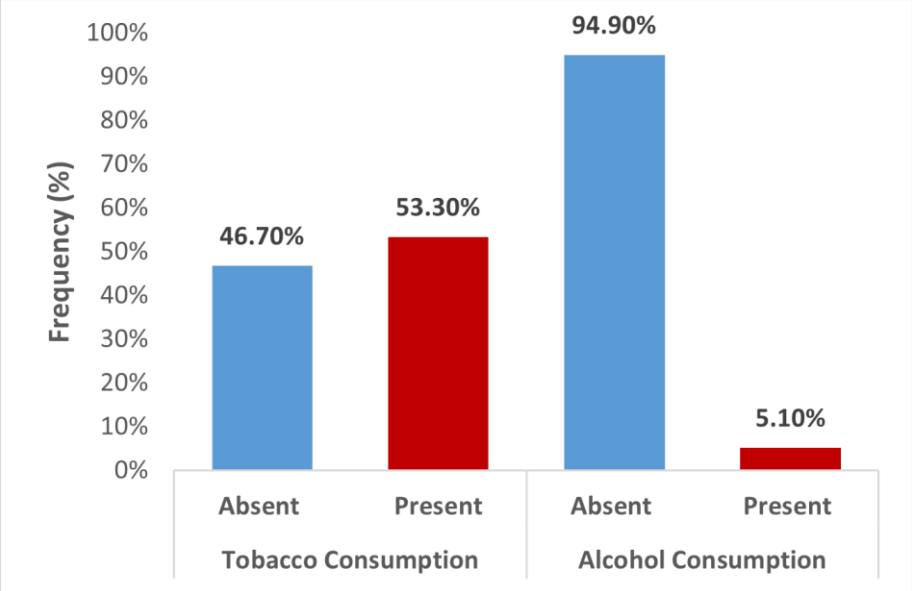
It was observed that 42.3% of the participants belonging to lower socioeconomic status had poor quality of life, whereas people belonging to middle and upper socioeconomic status, 26.3% and 31.4% had poor quality of life.

Figure 24: Pie diagram showing distribution of Poor Quality of life among elderly according to Type of family



Of 137 participants who had poor quality of life, it was noted that 65% of them had poor quality of life who belonged to extended family and 35% of them had poor quality who belonged to nuclear family.

Figure 25: Distribution of Poor Quality of life among elderly according to Substance use



Among participants who reported to consume tobacco 53.3% of them had poor quality of life whereas people who did not consume tobacco 46.7% of them had poor quality of life. It is observed that only 5.1% of the participants who consumed alcohol had poor quality of life and people who did not consume alcohol 94.9% of them had poor quality of life.

Table 17: Association of various Socio-demographic Characteristics with Poor QoL among elderly (N=511)

Socio-demographic Variables		Number of Elderly (n=511)	Poor QoL (n=137) n (%)	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Age	**60-69 years**	263	50(36.5%)	**1**	**1**
	70-79 years	164	50(36.5%)	1.6(1.1-2.3) *	1.2(0.9-1.6)
	80 years & above	84	37(27%)	2.3(1.6-3.3) *	1.2(0.8-1.9)
Sex	**Male**	231	58(42.3%)	**1**	**1**
	Female	280	79(57.7%)	1.1(0.8-1.5)	0.9(0.6-1.4)
Education	**Illiterate**	388	107(78.1%)	2.1(0.6-7.6)	1.6(0.6-4.5)
	School	108	28(20.4%)	1.9(0.5-7.3)	1.7(0.6-5.0)
	College	15	02(1.5%)	**1**	**1**
Occupation	**Employed**	236	59(43%)	**1**	**1**
	Unemployed	275	78(56.9%)	1.5(1.2-2.1) *	1.3(0.8-1.9)
Socio -economic Status (SES)	**Lower**	243	58(42.3%)	**1**	**1**
	Middle	156	36(26.3%)	1.0(0.7-1.4)	1.0(0.5-1.7)
	Upper	112	43(31.4%)	1.6(1.2-2.2) *	1.4(0.9-2.2)
Marital Status	**Married**	379	83(60.6%)	**1**	**1**
	Others	132	54(39.4%)	1.9(1.4-2.5) *	1.5(1.1-2.1) **
Type of Family	**Nuclear**	200	48(35%)	**1**	**1**
	Extended	311	89(65%)	1.2(0.9-1.6)	0.9(0.7-1.1)
Tobacco Use	**Absent**	212	64(46.7%)	**1**	**1**
	Present	299	73(53.3%)	0.8(0.6-1.1)	0.7(0.6-1.0)
Alcohol Use	**Absent**	492	130(94.9%)	**1**	**1**
	Present	19	7(5.1%)	1.4(0.8-2.6)	1.7(0.6-4.7)

Chronic Disease	**Absent**	171	24(17.5%)	**1**	**1**
	Present	340	113(82.5%)	2.4(1.6-3.5) *	1.8(1.4-2.3) **
Walking Aid	**No walking aid**	436	94(68.6%)	**1**	**1**
	Use of walking aid	75	43(31.4%)	2.7(2.0-3.5) *	1.7(1.2-2.5) **
Fall	**No Fall**	272	47(34.3%)	**1**	**1**
	Had Fall	239	90(65.7%)	2.2(1.6-3.0) *	1.5(1.2-2.0) **

PR Prevalence Ratio, CI Confidence Interval, * in Unadjusted PR p Value <0.05 Significant, ** in Adjusted PR p Value <0.05 Significant

Of 511 participants, 137(26.8%) were found to have poor QoL. In univariate analysis, it was observed that 36.5% among by people aged between 70-79 years (PR=1.6, [95% CI 1.1-2.3]) followed by those aged 80 years and above it was 27% (PR=2.3, [95% CI 1.6-3.3]) had poor QoL when compared with those aged 60-69 years and this association was statistically significant. It was observed that Female participants (PR= 1.1, [95% CI 0.8-1.5]) had poor QoL when compared to male, however it was not found to be statistically significant. Regarding education, elderly who were illiterates (PR=2.1, [95% CI 0.6-7.6]) and who reported to have finished schooling (PR= 1.9, [95% CI 0.5-7.3]) had poor QoL when compared to elderly, who had finished college and the association not statistically significant. Older adults who were not employed had (PR= 1.5, [95% CI 1.2-2.1]) 1.5 times higher odds of having poor QoL when compared to employed elderly and the association was statistically significant. Individuals coming from higher socioeconomic class and middle socioeconomic class, 31.4% (PR=1.6, [95% CI 1.2-2.2]) and 26.3% of (PR=1.0, [95% CI 0.7-1.4]) them had poor QoL whereas people belonging to lower socioeconomic status 42.3% of them had poor QoL and the association was statistically significant. Unmarried and widow older adults had 1.9 times higher odds (PR= 1.9, [95% CI 1.4-2.5]) of having poor QoL compared to married older adults and this association was statistically significant. For Type of family, elderly belonging to extended family (PR= 1.2, [95% CI 0.9-1.6]) had poor QoL when compared to elderly from nuclear

family. Among elderly who reported to consume tobacco 53.3% of them had poor QoL Quality of life when compared to people who were not consuming tobacco. Elderly with chronic disease (PR=2.4, [95% CI 1.6-3.5]) had poor QoL when compared to those without chronic disease and this association was statistically significant. It was observed that people using walking aid (PR= 2.7, [95% CI 2.0-3.5]) had higher odds of having poor QoL compared to people who were not using walking aid and the association was statistically significant. Elderly who reported to have fall in past 12 months (PR=2.2, [95% CI1.6-3.0]) had poor QoL compared to people with no history of falls and this association statistically significant. In univariate, it was found that elderly aged 70 years and 80 years above, unemployed individuals, upper socioeconomic class, unmarried and widow individuals presence of chronic disease, use of walking aid and elderly with history of fall had poor QoL and were found to be statistically significant ($p< 0.05$).

Following univariate analysis, stepwise multi-variable logistic regression was carried out. It was found that unmarried and widow elderly, presence of chronic disease, use of walking aid and individuals who reported to have falls had association with poor QoL and found to be was statistically significant (< 0.05).

6 DISCUSSION

The present, community based cross-sectional study was conducted among elderly aged 60 years and above. This study was carried out in Devarayanasamudra, PHC area a rural field practice area of Kolar, Department of Community Medicine, Sri Devaraj Urs Medical College. This study assessed the prevalence of falls and its association with socio-demographic variables and impact of falls on Quality of Life among elderly. In the present study out of 511 elderly, 54.8% of the elderly were females and 45.2% of them were males. Majority of the elderly, 51.5% were in the age group 60-69 years. It is observed that, 77.3% of them were illiterates. About 51.3% among the elderly were either shop owners or farmers and 77.2% of study population were married. It is observed that, 2/3rd (66.5%) of the elderly reported to have chronic disease. It was found that 58.5% of the participants consumed tobacco and only 3.7% of the elderly consumed alcohol. About 46.8% of the elderly reported to have fall in past 12 months. It is found that participants who had history of falls reported high concern for falling. People aged 70 and above, females, presence of chronic disease and use of walking aid is significantly associated with falls. The mean QoL scores were less among participants who had fall and was statistically significant. The quality of life was poor among elderly who were widowed/unmarried, presence of chronic disease, use of walking aid and who had falls.

6.1 Sociodemographic Characteristics:

Among various studies done by Sharma PK et al, Rekha M. R et al and Sirohi A et al in the rural areas, it is observed that mean age of participants was found to be 67.5 ± 6.4 years, 69.5±7.2 years and 69.4 ± 6.7 years.[91,96,101]] In studies done in urban areas by Mane A.B et al, Dhargave P et al, Pitchai P et al and Rivasi G et al , observed that mean age of participants was 69.4 ± 7.5 years, 74.6 ± 8.4 years, 71.8 ± 7.4 years and 72.7 ± 7.2 years respectively.[36,88,93,104] In the present study, mean age of the participants is 70 ± 7.7 years, which is slightly higher compared to the other studies done in rural areas.

A study done by Chacko TV et al found 57.4 % of the participants belonged to the age group 60-69 years, 33% of them between 70-79 years and about 9.6% of them were aged 80 years and above.[95] A cross-sectional study conducted by Rekha M. R et al in rural areas of Thiruvananthapuram, found that majority of the participants 53.5 % were in the age group between 60-69 years and 46.5% of them were between 70-79 years, respectively.[96] In a study conducted in rural areas of Haryana by Sirohi A et al observed that about 51% of the study subjects were between the age group of 60-69 years, followed by 37.9 % of them were between 70-79 years and 10.9% of them were above 80 years.[101] Studies carried out in urban areas by Mane A.B et al, Pitchai P et al , Philip S.A et al and Kumar R.S et al observed that majority of the participants belonged to the age group of 60-69 years compared to people aged 80 years and above.[36,93,97,100] In the present study, majority of the participants 51.5% were between the age group 60-69 years followed by 32.1% who belonged to the age group 70-79 years, whereas 13.9% and 2.5% of them

were between 80-89 years and above 90 years. The findings were almost similar when compared with other studies.

In the present study, showed that majority 54.8% of the elderly were females and 45.2% of them were males, which is similar to a study conducted by Sirohi A et al in rural areas of Haryana, and Check T.V et al in rural area of Coimbatore, that majority of the participants 56 % and 57.9% of them were females. [95,101] In other studies, conducted in urban areas by Dhargave P et al, Pitchai P et al, Philip S.A et al and Kumar R.S et al a similar findings were made that majority of the study participants were females,[88,93,97,100] whereas a cross sectional study conducted by Tripathy N.K et al in rural and urban areas of Chandigarh noted that majority of the participants 53.3% of them were males and 46.6% of them were females.[99]

In the present study, it is observed that most of the study participants 77.3% of them were illiterates, and 22.8% of them had received some form of education. Similarly Sirohi A et al in rural areas of Haryana, observed that, 60% of the participants were illiterates,[101] while Chacko T.V et al and Rekha M.R et al in rural areas of Coimbatore and Thiruvananthapuram made a similar observation that 31.1% and 24.8% of the participants were illiterates,[95, 96] whereas study carried out in rural and urban areas of Chandigarh by Tripathy N.K et al observed that majority 67% of the participants were educated and 33% of the participants were illiterates which is different from present study.[99] In another study conducted by Srivastava M.R et al in urban and rural areas of Lucknow

found that majority of the participants 87.75 % were illiterates and only 12.25% of the participants had received education.[103] When compared to various studies conducted in south India, in the present study illiterates were more.

In the present study, it is observed that, majority (53.9%) of the elders were employed, and 46.1% of the participants were unemployed. This observation is similar the observations made by Chacko TV et al where it is found that 70.5% of the participants were working and 29.5% of them were unemployed.[95] In cross-sectional studies conducted by Tripathy N.K et al and Srivastava M.R et al in both rural and urban areas of Chandigarh and Lucknow observed that , majority of the participants 88% and 71.8% of the elderly were unemployed respectively.[99,103]

In the present study, regarding marital status it is observed that majority of participants 74.2% of them were married, 0.8% were unmarried while 25% were widows. In a study conducted by Agarwalla R et al also found that majority of the participants 89.7% of them were married and 10.3% of the participants were widowed/Divorced.[102] In other studies, conducted by Chacko T.V et al ,Rekha M.R et al and Tripathy N.K et al in rural areas observed, 60% , 58.8% and 78% of the elderly were married respectively which is similar to the present study.[95,96,99] In studies, conducted in urban areas almost similar findings were observed and majority of participants were married.[88,90,93,97] In this present study, people who were widows were comparatively higher in proportion when compared with

other studies. This observation could be because, majority of the subjects who were widowed were between the age group 70-79 years.

About 36.6% participants in the present study, belonged to upper middle class and 30.5% in middle class socioeconomic category. In a similar study conducted by Srivastava M.R et al found that about 13.3% and 7.6% participants belonged to middle class and upper middle-class socioeconomic status, respectively.[103] In another study conducted in rural areas of Coimbatore by Chacko T.V et al observed that majority of the participants 31.6% of them belonged to lower middle class and about 24.6% of them belonged to middle class.[95] Rekha M.R et al in rural areas of Thiruvananthapuram observed that majority of the participants 85.1% belonged to lower socioeconomic class and only 14.9% were in high socioeconomic class.[96] In studies conducted in urban areas, observed that majority of the participants belonged to middle and upper middle socioeconomic class.[36,90,93,97,99,100] In the present study, majority of them belonged to upper middle class and middle class in comparison with other studies carried out in rural areas. The observation made in the present study might be because most of the study subjects were either shop owners or farmers and were doing skilled work and the classification used for categorizing the socioeconomic class varies among the studies.

In the present study it was observed that 60.9% of participants were from extended family followed by 39.1% were from Nuclear family. It is similar with the findings made by Mane A.B et al, Venkatesha M et al and Philip S.A et al , it is observed that majority of

the participants belonged to extended family 67.2%, 56.5% and 52.4% respectively.[36,90,97] In a study conducted by Chacko TV et al in Vedapatti village, observed that majority 56.8% of them belonged to a nuclear family and 43.2% were from extended,[95] which findings were not similar to the present study. In the present study it is noted that majority of the people belong to extended when compared to other studies conducted in rural area. This variation could be due to the differences in sample size among the studies.

In various studies conducted in India it is found that chronic disease varied, between 25.6-69.6% respectively.[88,89,90,95,96,97,101] In the present study, majority of the participants 66.5% of them had some form of Chronic disease. In the present study it is found that only 58.5% of the participants consumed tobacco and only 3.7% reported to consume alcohol. In various studies it is found that 10-70.7% of participants consumed alcohol and about 99.5% of them consumed some form of tobacco. [36,89,93,95,96,97,100,101] It is noted that there is a wide variation in consumption of tobacco and alcohol when compared with other studies. This could be due to social and cultural factors practices followed in other states differ.

6.2 Prevalence of Falls

The total prevalence of falls among elderly in the present study was found to be 46.8%. In various studies conducted in India and outside, the prevalence of falls varied from 8.2-62%.[77-103] Tripathy N.K et al conducted a community-based study among elderly in

rural, urban and slum areas of Chandigarh and reported the prevalence of falls as 31%.[99] In a study conducted by Sirohi A et al in rural area of Faridabad, Haryana, the prevalence of falls was found to be 36.6% , it is lower compared to the present study.[101] A study conducted by Chacko TV et al in Vedapatti village, Coimbatore found the prevalence to be 26%. , which is not similar the with findings made in the present study.[95] The findings were found to vary across the urban areas of country ranging between 13-42.2%.[88-90,97,98,100]

The wide variation might be due to geographical disparity across the country with respect to various factors influencing prevalence of fall. This could also be due to variation in methodology adopted in terms of sample size and age groups included in various studies.

In the present study it is observed that majority of participants 73.2% reported to have fallen once, 20.5% of them twice and 6.3% of them had fallen more than thrice. It is similar to a study conducted by Sirohi A et al in rural areas of Haryana, it is observed that majority 77.2% had fallen once, 9.6% had fallen twice and 13.2% of them had fallen thrice.[101 Rekha M.R et al observed that 79.6% had fallen once, 12.95% had fallen twice whereas 7.5% of them had fallen thrice,[96] which is also similar to present study. Sharma P.K et al, Tripathy N.K et al and others observed that majority of them had fallen once 62% and 87% respectively. [91,99,95,97,100,102]

In this study it was found that all 239 participants who had fall suffered from injuries. In a study conducted by Gamage N et al in Srilanka found that prevalence of injury among

elderly to be 35.9%.[82] Various studies conducted across India found that injuries is found to vary from 56.7 to 73.8%. [95,99,101,102] This wide variation could be because, there might be variation in period prevalence of injuries.

In the present study it is observed that, majority 41.4% of them had cuts and abrasions followed by 28.5% of them had bruises and 20.1% of the participants reported to have broken wrist and broken hip. It is similar to a study by Sirohi A et al conducted in a rural area of Haryana, it is observed that among people who had fall, most of elderly sustained 86.7% cuts, abrasions, and bruises.[101] In a similar study by Chacko T.V et al it is observed that majority 60.5% of them sustained bruises after fall and in present study the study subjects who sustained with bruises were comparatively lower. [95] In other studies, by Tripathy N.K et al and Agarwalla R et al found that majority of them sustained fractures 47% and 18% respectively following fall, findings made in these studies is not in accordance with the present study.[99,102] The distribution of injuries vary among the studies, it may be due to the recall bias among the participants.

In the present study it is observed that fall outside home 79.1% was the most common place. It is consistent with the findings by Chacko T.V et al and Agarwalla R et al observed that majority of people 60% and 56% had fallen outside respectively,[95,102] whereas study conducted by Tripathy N.K et al it is found that majority of 68% people had fallen inside home, however this finding is not similar with the present study.[99] Similarly, in a study by Sirohi A et al it was observed that falls inside home was 59.3%

whereas 40.8% of them had fallen outside.[101] The distribution of falls with respect to the places differ. The differences may be due to the sample size across various studies, occupation of the study population and prevalence of fall is also observed to vary over the states.

In the present study it is observed that most of the participants reported to have fallen in the afternoon (36.4%), evening (33.9%) followed by morning (28.9%) respectively. It is similar to the study conducted by Rekha M.R et al in rural areas of Thiruvananthapuram, observed that majority of the people had fallen 43% in the morning, followed by 40% of them in the afternoon and 17% of them in the evening.[96] Similarly, study by Chacko T.V et al in rural areas of Coimbatore, also observed that 39.1% of them fell in the morning followed by 21.60% in afternoon whereas 19% of them in evening.[95] Other studies conducted in different parts of India also observed similar findings majority of them had fallen in morning.[93,99] In a study conducted by Sirohi A et al it was observed that 38.9% had fallen during the afternoon and the finding is not consistent with the present study.[101]

6.3 Fear of Falling and Falls

In the present study it is observed that fear of falling score was high (89.5%) among elderly who reported to have fall in past 12 months. Elderly who had fall in past 12 months showed significant association with Fear of Falling ($p<0.05$). In a similar study by Mane A.B et al conducted in urban areas of Raichur, observed that fear of falling was 48.7% who had falls compared to people 25.9% who did not have fall.[36] In people

who had falls about 54.3% of them did not experience fear of falling. In a similar study by Rivasi G et al also, observed that fear of falling was 71.4% among people who had fall.[104] Similarly, in a study conducted by Pitchai P et al observed that 34.7% of them who had fall reported to have fear of falling. Among people who reported to have fall, 34.3% had lower concern, 29.4% had moderate concern and 36.1% had high concern for fear of falling again.[93] In the present study it is observed that fear of falling among participants who had falls was significantly higher when compared with various other studies. This variation may be due to the prevalence of falls which varies across the different studies and the scale used to assess the fear of falling might differ.

6.4 Sociodemographic characteristics and Falls

In the present study it is observed that prevalence of falls is 35.2% and 24.6% among people aged between 70-79 years, 80-89 years and were significantly associated with falls. In a similar study by Sirohi A et al in rural area of Faridabad, Haryana also found that prevalence of falls increased with the age, it is 58% among people aged 80 years and above.[101] A study conducted by Rekha M.R et al in rural areas of Thiruvananthapuram also observed that prevalence of falls is high among people above 70 years was 21.3%.[96] A study by Patil S et al in urban areas of Bangalore, Karnataka found that the prevalence of fall is 65.7% among elderly aged 70-75 years [89] A similar study conducted by Pitchai P et al in urban areas of Konkan division of Maharashtra noted similar findings that, prevalence of falls among people aged 70-79 years was 46.5%.[93] Similar observations

in the prevalence of falls was found in the study conducted by Philip S.A et al 46.7% among persons aged 70 years and above.[97]

In present study it is found that female participants 60.3% reported to have higher falls compared to male. It is similar to a study by Agarwalla A et al in rural areas of Assam, also observed that prevalence of falls among females was found to be 55.4% as compared to males.[102] In a similar study conducted by Saikia A.M et al observed that prevalence was 66.7% among females.[92] Other studies by Chacko T.V et al in Vedapatti, Coimbatore and in rural area of Thiruvananthapuram by Rekha M.R et al made similar observations of higher prevalence of falls was more among females compared to males.[95,96] A study conducted in Konkan division of Maharashtra found prevalence of falls among males was 51.4% as compared to females and the finding is not similar to the present study.[93]

In present study it is observed that about 75.7% of participants who were illiterates and 21.3% who had finished schooling had higher prevalence of falls, however it is not statistically significant. In a study conducted by Sirohi A et al, also found that illiteracy was found to have association with falls in univariate analysis and in multivariate analysis it was found that it was insignificant and had no association with falls.[101] In a study conducted by Rekha M.R et al in rural areas of Thiruvananthapuram also found to have similar observation that, prevalence of falls was 40% among people who were illiterates.[96] Similarly, in another study by Chacko T.V et al also observed that,

prevalence of falls was 27.9% among illiterates.[95] Kumar R.S et al in urban areas of Chennai observed that the prevalence of falls was 40.7% among the elderly people who were literates.[100] In other studies, by Pitchai S et al and Philip S.A et al, observed that prevalence among people who were literates was 27.3% and 28.6% respectively.[93,97]

In the present study it is observed that the prevalence of falls was 51.5% among participants who were not working, however it is not statistically significant. In a study by Chacko T.V et al in rural areas of Coimbatore observed that prevalence of falls was 33.9% among people who were employed and the finding was not consistent with the present study.[95] In a study by Venkatesha M et al in the urban areas of Kolar, a similar observation is made, prevalence of falls among unemployed was 55.3% compared to people who were employed 44.7%.[90] Studies by Philip S.A et al and Kumar R.S et al, similar findings were observed 30% and 38.1% among unemployed people.[97,100]

In the present study it is observed that prevalence of falls was 30.5% and 24.7% among participants belonging to middle socioeconomic class and upper socioeconomic class, however it is not statistically significant. Sirohi A et al in rural area of Ballabgarh block of Faridabad district, Haryana observed that prevalence of falls was 45.5% among people who belonging to lower socio-economic status and this observation is not consistent with the present study.[101] In a similar study by Chacko T.V et al found that falls among elderly was more in the low socioeconomic status group.[95] Among people who belonged to high socioeconomic status prevalence of falls was 35.4% by Pitchai S et al and in another

study by Rekha M.R et al observed prevalence of falls as 28% and these observations were similar to the findings of the present study.[93,96]

In the present it is observed that participants who were unmarried and widowed the prevalence of falls was 33.5%, however it is not statistically significant. Venkatesha M et al also found that falls was 36.8% among widow compared to married people.[90] Similar findings is observed by Philip S.A et al 32.6% among widow/ widowers compared to married people,[97] whereas studies conducted by Pitchai S et al and Kumar R.S et al observed that prevalence of falls among married people was 64.5% and 37.8% respectively and these findings made by them is not similar with the present study.[93,100] In a study by Rekha M.R et al also observed that falls was 27.7% among married people.[96] A similar study conducted by Sirohi A et al in rural areas of Haryana found that falls was not associated with marital status. In a study conducted by Tripathy N.K et al also had similar findings to that of the present study.[99]

In the present study it is observed that participants belonging to extended family had 65.7% prevalence of falls compared to participants belonging to nuclear family, however it is not statistically significant. In another study done by Chacko TV et al observed that prevalence of falls of 56.8% among nuclear family and was found to have association with falls, however the findings are not similar with the present study.[95] In another study conducted by Sirohi A et al also observed that falls had no association with type of

family.[101] A study by Venkatesha M et al in urban areas of Kolar, observed that falls was 55.3% among people belonging to Nuclear family compared to 44.7% extended family.[90] In other studies, by Philip S.A et al and Kumar R.S et al observed that prevalence of falls among people belonging to nuclear family was 30.9% and 38.4% respectively which was contradicting the findings in the present study.[97,100] In a study by Pitchai S et al in Konkan division of Maharashtra, observed that falls among extended family was 86.7% compared to people from 13.3% nuclear family and the findings is consistent with the present study.[93]

In this study it is found that prevalence of falls among participants using tobacco was 57.3% and 2.5% among participants who reported to use alcohol, however it is not statistically significant. Study by Venkatesha M et al conducted in urban areas of Kolar, also found that falls was 63.2% among people reported to use alcohol and 5.3% who used tobacco and the findings were significant.[90] Patil S et al in urban area of Bangalore, also made similar observation that falls was 44.3% who used tobacco compared to 43.1% alcohol.[89] Similar findings is observed in a studies conducted by Chacko T.V et al and Kumar R.S et al that prevalence was 29.3% among who consumed alcohol and is 44.4% among participants who reported to consume tobacco. [95,100]

In the present study it is observed that prevalence of falls was 78.2% among participants with chronic disease and was found that it was significantly associated with falls. In a similar study conducted by Rekha M.R et al and Sirohi A et al in rural areas of

Thiruvananthapuram and Haryana observed the similar findings, prevalence of falls was 30.8% and 25.5% among participants who had chronic disease.[96,101] In other studies, conducted by Chacko T.V et al and Kumar R.S et al also made similar observation that falls was 35.6% and 41.5% in people who had chronic disease.[95,100] Patil S et al conducted a study in urban areas of Bangalore, observed that falls was 48.1% among people who had chronic disease.[89]

In the present study, among elderly who reported to use walking aid it is observed that prevalence of falls was 23.8% and was observed to have significant association with the falls. In a study conducted in rural areas of Srilanka by Gamage N et al also found that prevalence of falls was 24.3% among study subjects who reported to use walking aid was found to have association with falls.[82] In a study by Patil S et al in urban area of Bangalore, found that falls was 65.7% among people who used walking aid in comparison to people who did not use it.[89] Studies, by Venkatesha M et al and Kumar R.S et al, made similar observations of falls was 34.2% and 39.1% among people who used walking aid.[90,100] The observation made in the present study was consistent with the other studies and it is found that the prevalence is high compared to other studies. The variation observed is may be because of higher prevalence of falls among elderly and the sample size of the present study.

6.5 Falls and association with Domains of Quality of Life (QoL)

In this present study it is observed that mean scores were higher in psychological 53.7 (±16.8) and environmental 53.0(±14.3) domains, respectively. The mean scores are least

39.3±17.6 for physical domain among people who reported to have fall. Among participants who had fall and no fall, it was observed that mean scores were comparatively lower among people with fall and was statistically significant. As per our knowledge, this is the first study done which compares association of falls with different domains of Quality of Life. There were no similar studies to compare the association of falls among different domains of Quality of Life.

6.6 Sociodemographic Characteristics and Poor Quality of Life (QoL)

In the present study it is observed that 36.5% and 27% of the participants aged 70 -79 years and 80 -89 years had poor Quality of life. However, it is not significantly associated with poor Quality of life. In a similar study conducted by Dasgupta A et al in rural areas of West Bengal observed that people 62.3% aged 60 -69 years had poor Quality of life, however the observations were not consistent with the present study[117] Similarly, in a study conducted by Rajasi R.S et al observed that majority of people 56.8% aged 60-69 years had poor Quality of life, followed by 33.1% aged 70-79 years and only 10% of people aged 80 years and above had poor Quality of life.[118] In the present study people aged between 70-79 and 80-89 years had poor quality of life compared to the other studies. The poor Quality of life is associated with increasing age, which indicates the despair of ageing greatly affects Quality of life. Moreover, older people are more likely to be affected with chronic illness, which is a natural phenomenon.

In the present study it is observed that 57.7% of the females had poor Quality of life when compared to males, however there is no significant association with poor Quality of life.

In a study conducted by Dasgupta A et al observed that 61.6% of female had poor Quality of life as compared to males 41% and was statistically significant.[117]

In the present study it is observed that 78.1% of illiterates and 20.4% of them who had finished schooling had poor Quality of Life when compared to people who had finished graduation, however it is not significantly associated. It is observed that a similar study conducted by Rajasi R.S et al found that prevalence of poor Quality of life was more among participants with schooling status and was not statistically associated with Quality of life. Dasgupta A et al also found that poor Quality of life was not significantly associated with education status. Similar observation was made when compared with other studies.

In the present study, 56.9% of unemployed participants had poor Quality of life when compared to participants who were employed however, it is not significantly associated. A similar study by Dasgupta A et al in rural areas of West Bengal observed that among people who were working 35% of them had poor Quality of life compared to people who were unemployed, however the findings were similar to the present study.[117] In another study by Rajasi R.S et al also it was observed that 90% of the persons who were unemployed had poor Quality of life compared to employed people and was similar to the findings made in the present study.[118]

In the present study it is observed that 31.4% of participants who were belonging to upper class had poor Quality of life when compared to participants belonging to middle and

lower socioeconomic class, but it is not significantly associated with poor Quality of life. In a study conducted by Rajasi R.S et al in rural areas of Thiruvananthapuram observed that people belonging to low socioeconomic status 65.5% of them had poor Quality of life compared to people from high socioeconomic status, however the findings was not consistent with the observations made in the present study.[118] Similarly, in a study by Dasgupta A et al observed that 56.5% of people from low socioeconomic status had poor Quality of life.[117] The observation made from the present study differs from that of other studies. Quality of life is poor among participants from higher socioeconomic status, this difference might be because majority of the participants from the present study were employed in comparison with the other studies.

In the present study it is observed that 39.4% of unmarried and widowed people had poor Quality of life in comparison to married individuals, and the association with poor Quality of life is statistically significant. In a study conducted by Dasgupta A et al in rural areas of West Bengal, also noted that people who were widow/ widower (73.7%) had poor Quality of life.[117] Similarly, in a study by Rajasi R.S et al it is observed that 63.7% of widows had poor Quality of life, followed by 27.5% among married and 5.6% among unmarried people and the findings observed across the various studies was consistent with the present study.[118]

In the present study it is observed that 65% of the participants belonging to extended family had poor Quality of life compared to participants from nuclear family, however it

is not significantly associated. In a study conducted by Dasgupta A et al in rural areas of West Bengal observed that 95.2% of the people belonging to Nuclear family had poor Quality of life compared to 4.7% coming from extended family and the findings were not similar to the present study.[117] The variation observed may be because most of the participants in the present study belonged to three generation or a joint family, and this was lacking in the other study.

In the present study 53.3 % of the participants who were using tobacco and 5.1% of the participants who reported to use alcohol had poor Quality of life, however they were not significantly associated. In a study conducted by Dasgupta A et al it was observed that 54.4% of people who reported to use alcohol had poor Quality of life in comparison to the people who did not use it and the findings is not consistent with the observations made in the present study.[117]

In this present study it is found that 82.5% of the participants with chronic disease had poor Quality of life when compared to participants who had no chronic disease and was found to have significant association. It is observed in a study by Dasgupta A et al in the rural areas of West Bengal, that similar observation was made 76.6% of people who had comorbidities had poor Quality of life in context to people who did not have comorbidity.[117]

In the present study it is observed that, 31.4% of the participants who reported to use of walking aid had poor Quality of life in contrast to participants who were not using

walking aid and was noted to have significant association with poor Quality of life. As per our knowledge this is the first study done, which compares the association of walking aid with Quality of Life. No studies studied association of use of walking aid with poor Quality of life.

In this present study it is observed that 65.7% of the participants who reported to have fall in past 12 months had poor Quality of life compared to participants who had no fall , the association of fall with poor Quality of life was statistically significant . In a study conducted by Nihaata et al observed that that people with poor visual acuity and visual field had poor Quality of life among them and was observed to be associated with falls. As per our knowledge this is the first study done, which compares the association of falls with Quality of Life. No similar study was conducted which studied association of fall with poor Quality of life.

7 SUMMARY

The present study is a community based cross-sectional which was conducted to estimate the prevalence of falls, its risk factors and impact on Quality of life among elderly. The overall prevalence of falls among elderly is 46.8%. It is observed that people who had falls had high scores for Fear of Falling. In elderly the prevalence of falls was higher with increasing age. Females had relatively higher prevalence of fall when compared to male. Elderly with comorbidity were found to have more prevalence of falls. The use of walking aid was found to be associated with high prevalence of falls. In our study it was observed that fear of falling score was high (89.5%) among elderly who had fall in past 12 months. Elderly who had fall in past 12 months showed significant association with Fear of Falling. In this study the mean scores were higher in psychological 53.7 (±16.8) and environmental 53.0(±14.3) domains, respectively. The mean scores were least among 39.3±17.6 physical domain among people who reported to have fall. The mean Quality of life scores were less among participants who had fall in context to people who did not have fall. Elderly who were unmarried and widowed, with chronic disease, use of walking aid and who had falls were found to have poor Quality of life.

8 CONCLUSION

Falls among the elderly are significant public health problem. Falls are one of the significant geriatric giants posing threat to the independence of older persons. Most of the falls in the elderly are due to medical and behavioral factors that are predictable and hence they are preventable. To improve the health status of the elderly population, it is necessary to conduct out more research in different areas to define various factors that are related to falls, psychological distress and disability, which will help in developing effective programmes for managing geriatric problems.

9 RECOMMENDATIONS

It is recommended to identify other risk factors like cognition, grip strength and various environmental hazard contributing to fall. Identification of these factors provides insights to develop various preventive measures that are socially, culturally, and economically accepted by the elderly in our country. Community-based fall registries and surveillance systems can be set up.

We strongly emphasis on multidisciplinary approach in prevention of falls and to improve quality of life among elderly. A comprehensive fall risk assessment tool for easier screening can be developed for Indian settings and fall prevention must be emphasized in the health programs for the elderly people.

Studies on costs incurred during a fall event is essential to highlight the economic impact on an individual, family and the health system to appeal for policy attention. Awareness regarding fall must be provided and reemphasized by health care professional at every opportunity to limit the grave consequences of fall.

Health education for elderly with respect to, social and physical group recreational activities will build their confidence and improves the quality of life. Health education should be given to the family members especially the young. Their role in keeping elders happy, active and to support them physically, socially, and environmentally is of at most importance.

It is crucial to align health systems to meet the needs of the elderly people. Provision of geriatric care should be arranged in the community to serve the elderly people especially who consider their health as poor. We suggest, longitudinal studies should be conducted in the coming future, to estimate the direction of causation between Quality of Life and falls.

10 Limitations

The following are the limitations. Study has an inherent recall bias, as the duration of the recall period was one year. Temporal association of falls with chronic health conditions cannot be established due to the cross‐sectional type of the study design. Although home was found to be the most common place of fall, assessment of home environment was not done in this study. Community‐based nature of the study and high response rates are some of the strengths of the present study. The study design studies the factors associated with falls as shown in earlier studies. Identification of these factors and appropriate corrective measures can help in preventing the falls and their consequent effects on the health and well‐being of the elderly persons.

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ANNEXURE Ⅰ

Proforma for data collection

Section A:

1. Name:

2. Address:

3. Socio-demographic details

Age	
Gender	
Education	
Occupation	
Marital status	
Total monthly family in come	
Number of family members	
Type of family	
Children in the house	
Type of ration card	
Presence of chronic disease	

4. Care giver (present/absent)

5.Use of walking aid (No/Walking stick/Walker/Wheelchair)

6.Tobacco use (Yes/No) Form? Duration of use?

7.Alcohol use (Yes/No) Duration?

Section B:

Q1. Have you had any fall?

Q2. If so, how many times? Once..... Twice……. Three or more times……

Q3. **Short Fall Efficacy Scale (Short FES-I).** How concerned you are that you might fall if you did this activity?

	Not at all concerned-1	Somewhat concerned-2	Fairly concerned-3	Very concerned-4
1.Getting dressed or undressed				
2.Taking a bath or shower				
3.Getting in or out of a chair				

4.Going up or down stairs				
5.Reaching for something above your head or on the ground				
6.Walking up or down a slope				
7.Going out to a social event (for example, religious service, family gathering, or club meeting)				
TOTAL SCORE =				

Scoring:

Low Concern: 7-8

Moderate Concern: 9-13

High Concern: 14-28

Q4. How did you fall? I tripped/I slipped/I lost my balance/I felt faint/I felt dizzy or giddy/I am not sure

Q5. As a result of fall or falls did you suffer from any injury? Yes () No ()

Q6. If yes, what type of injuries did you suffer?

Bruises ()

Cut /Brazes ()

Broken wrist ()

Broken hip ()

Broken ribs ()

Back pain ()

Q7. Capture place of fall (Home/Outside)?

Q8. Capture time of fall? (Morning/afternoon/evening/Not know)

Section C:

WHO-QOL BREF QUESTIONNAIRE

Q1. How would you rate your quality of life? Very poor (1)/ Poor (2)/ Neither poor nor good (3)/ Good (4)/ Very good (5)

Q2. How satisfied are you with your health? Very dissatisfied (1)/ Dissatisfied (2)/ Neither satisfied nor dissatisfied (3)/ Satisfied (4)/ Very satisfied (5)

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

		Not at all	A little	A moderate amount	Very much	An extreme amount
03	To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
04	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
05	How much do you enjoy life?	1	2	3	4	5
06	To what extent do you feel your life to be meaningful?	1	2	3	4	5
07	How well are you able to concentrate?	1	2	3	4	5
08	How safe do you feel in your daily life?	1	2	3	4	5
09	How healthy is your physical environment?	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	Do you have enough energy for everyday life?	1	2	3	4	5
11	Are you able to accept your bodily appearance?	1	2	3	4	5
12	Have you enough money to meet your needs?	1	2	3	4	5
13	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

15. How well are you able to get around? Very poor (1)/ Poor (2)/ Neither Poor nor Good (3)/ Good (4)/ Very good (5)

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

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16	How satisfied are you with your sleep?	1	2	3	4	5
17	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18	How satisfied are you with your capacity for work?	1	2	3	4	5
19	How satisfied are you with yourself?	1	2	3	4	5
20	How satisfied are you with your personal relationships?	1	2	3	4	5
21	How satisfied are you with your sex life?					
22	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23	How satisfied are you with the conditions of your living place?	1	2	3	4	5

24	How satisfied are you with your access to health services?	1	2	3	4	5
25	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26	How often do you have negative feelings such as blue mood, despair, anxiety, depression					

Annexure Ⅱ

INFORMATION SHEET

Title of the study: Prevalence of falls, its risk factors and impact on quality of life among elderly living in rural area of Kolar.

My name is **Dr. Bhoomika V**, Postgraduate in the department of Community Medicine, Sri Devaraj Urs Medical College, Kolar. We are carrying out a study on prevalence of falls among elderly in rural areas of Kolar. The study has been reviewed by the local ethical review board and has been started only after their formal approval.

Falls among elderly is one of the major problems. There are studies which suggest that there are various factors which are predictors of falls. They are one of the significant causes of death and are also major cause for decrease in quality of life. In this regard, I will ask you some questions about your household and the members staying at your household. You need not have to answer any questions that you do not want to answer, and you may end this interview at any time you want to. However, your honest answer to these questions will help us better understand the health status of this area. We would greatly appreciate your help in responding to this survey. The survey will take about half an hour.

Participation in this study does not involve any cost. This study is not only beneficial to the child but also to the community in large. The results gathered from this study will be beneficial in evaluating the services provided by the health care delivery system by the Government.

There is no compulsion to participate in this study. You will be no way affected if you do not wish to participate in this study. You are required to sign only if you voluntarily agree to participate in this study. Further, you are at a liberty to withdraw from the study at any time if you wish to do so. Be assured that your withdrawal will not affect your treatment by the concerned physician in any way. It is up to you to decide whether to participate.

For any further clarification you are free to contact the principal investigator,

Dr. Bhoomika V; Mobile No: 9481027719

Annexure Ⅲ

INFORMATION SHEET - KANNADA

ಗೌಪ್ಯತೆ ಮತ್ತು ಸಮ್ಮತಿಯ ಪತ್ರ

ತನಿಖೆದಾರರ ಹೇಳಿಕೆ:

ಪರಿಚಯ: ನನ್ನ ಹೆಸರು ಡಾ॥ಭೂಮಿಕಾ ವಿ. ನಾನು ಶ್ರೀ ದೇವರಾಜ್‌ಅರಸ್ ವೈದ್ಯಕೀಯಕಾಲೇಜಿನ ಸಮುದಾಯ ವೈದ್ಯಶಾಸ್ತ್ರ ವಿಭಾಗದಲ್ಲಿ ಉನ್ನತ ವಿದ್ಯಾಭ್ಯಾಸ ಮಾಡುತ್ತಿರುವ ವಿದ್ಯಾರ್ಥಿ. ನಾನು ''ವಯೋವೃದ್ಧರಲ್ಲಿನ ಬೀಳುವಿಕೆಯ ವ್ಯಾಪಕತೆ ಮತ್ತು ಜೀವನದ ಗುಣಮಟ್ಟ''ಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಆರೋಗ್ಯ ಮಾಹಿತಿ ಬಗ್ಗೆ ಅಧ್ಯಯನ ಮಾಡುತ್ತಿದ್ದೇನೆ. ಈ ಅಧ್ಯಯನಕ್ಕೆ ಕಾಲೇಜಿನ ನೈತಿಕ ಸಮಿತಿಯವತಿಯಿಂದ ಮನ್ನಣೆ ದೊರೆತಿರುತ್ತದೆ.

ಅಧ್ಯಯನಕ್ಕೆ ಸಮ್ಮತಿ ಪತ್ರ: ಬೀಳುವಿಕೆ ಎಂದರೆ, ಉದ್ದೇಶವಿಲ್ಲದೆ ನೆಲದ, ನೆಲಹಾಸಿನ ಮೇಲೆ ಅಥವಾ ಇತರ ಕೆಳಮಟ್ಟದ ಮೇಲೆ ಹತೋಟಿಯಿಲ್ಲದೆ ಬೀಳುವುದು. ವಯೋವೃದ್ಧರಲ್ಲಿ ಬೀಳುವುಕೆ ಸಾಮಾನ್ಯ. ಏಕೆಂದರೆ ವಯಸ್ಸಾದಂತೆ ಉಂಟಾಗುವ ಸಾಮಾನ್ಯ ಪ್ರಕ್ರಿಯೆಗಳಾದ ದೃಷ್ಟಿ ಹೀನತೆ, ಶ್ರವಣ ಹೀನತೆ, ಚಲನಶೀಲತೆ, ಪ್ರತಿಕ್ರಿಯಿಸುವ ಸಾಮರ್ಥ್ಯ ಮತ್ತು ಪ್ರತಿಫಲಿತ ಸಾಮರ್ಥ್ಯಗಳು ದುರ್ಬಲಗೊಳ್ಳಲು ಶುರುವಾಗುತ್ತದೆ. ಈ ಅಧ್ಯಯನದ ಮೂಲಕ ವಯೋವೃದ್ಧರ ಜೀವನ ಗುಣಮಟ್ಟವನ್ನು ಅಧ್ಯಯನ ಮಾಡುವ ಗುರಿಯನ್ನು ಹೊಂದಲಾಗಿದೆ.

ಈ ವಿಷಯವಾಗಿ ನಾನು ನಿಮ್ಮನ್ನು ಕೆಲವು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುತ್ತೇನೆ ಹಾಗೂ ನಿಮಗೆ ಈ ಆಧ್ಯಯನದಿಂದ ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಹೊರಗುಳಿಯುವ ಅವಕಾಶವಿರುತ್ತದೆ. ನಿಮ್ಮ ಪ್ರಾಮಾಣಿಕ ಉತ್ತರವು ನಮ್ಮ ಅಧ್ಯಯನಕ್ಕೆ ಬಹು ಉಪಯುಕ್ತವಾಗಿರುತ್ತದೆ. ನಮ್ಮ ಈ ಅಧ್ಯಯನಯದಲ್ಲಿ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆಯನ್ನು ನಾವು ಶ್ಲಾಘಿಸುತ್ತೇವೆ. ಅರ್ಧಘಂಟೆಯ ಕಾಲ ಈ ಅಧ್ಯಯನಕ್ಕಾಗಿ ನೀವು ನಮ್ಮೊಡನೆ ಕಳೆಯಬೇಕಾಗಬಹುದು.

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮಗೆ ಭಾಗವಹಿಸಲು ಯಾವುದೇ ರೀತಿಯ ಖರ್ಚು ಬರುವುದಿಲ್ಲ. ಈ ಅಧ್ಯಯನವು ನಿಮಗೆ ಮಾತ್ರವಲ್ಲದೆ, ನಮ್ಮ ಸಮಾಜಕ್ಕೂ ಸಹ ಉಪಯುಕ್ತವಾಗಿರುತ್ತದೆ. ಸರ್ಕಾರದಿಂದ ಪಡೆಯಲಾದ ಆರೋಗ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಸೌಲಭ್ಯಗಳ ಮೌಲ್ಯಮಾಪನವನ್ನು ಮಾಡಲು ನೀವು ಕೊಡುವ ಮಾಹಿತಿಯು ಉಪಯುಕ್ತವಾಗಿರುತ್ತದೆ.

ನಿಮ್ಮಿಂದ ಪಡೆಯಲಾದ ಎಲ್ಲಾ ಮಾಹಿತಿಗಳನ್ನು ಗೌಪ್ಯವಾಗಿ ಇಡಲಾಗುವುದು. ಕಾನೂನಿನ ಚೌಕಟ್ಟಿನ ಹೊರಗೆ ಯಾವುದೇ ಕಾರಣಕ್ಕೂ ನೀವು ಕೊಡುವ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗ ಪಡಿಸುವುದಿಲ್ಲ. ನಿಮ್ಮಿಂದ ಪಡೆದಿರುವ ಮಾಹಿತಿಯನ್ನು ಕೇವಲ ಅಧ್ಯಯನಕ್ಕಾಗಿ ಮಾತ್ರ ಉಪಯೋಗಿಸಿಕೊಳ್ಳಲಾಗುವುದು.

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಸಾಮಾಜಿಕ ಮಾಹಿತಿಯನ್ನು ಪಡೆದು, ದೈಹಿಕ ಪರೀಕ್ಷೆ ಹಾಗೂಪರೀಕ್ಷೆ ಮಾಡಲಾಗುವುದು.

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲೇಬೇಕೆಂಬ ಕಡ್ಡಾಯವೇನಿಲ್ಲ, ನೀವು ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸದೇ ಇದ್ದರೂ ನಿಮಗೇನು ತೊಂದರೆಯಾಗುವುದಿಲ್ಲ. ನೀವು ಸ್ವಇಚ್ಛೆಯಿಂದ ಭಾಗವಹಿಸಿದರೆ ಮಾತ್ರ ನಿಮ್ಮ ಸಹಿಯನ್ನು ಈ ಸಮ್ಮತಿ ಪತ್ರದಲ್ಲಿ ತೆಗೆದುಕೊಳ್ಳಲಾಗುವುದು. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಯಾವುದೇ ಹಂತದಲ್ಲಿ ಹೊರಗುಳಿಯುವ ಅಧಿಕಾರ ನಿಮಗಿರುತ್ತದೆ. ನೀವು ಅಧ್ಯಯನದಿಂದ ಹೊರಗುಳಿದರೂ ಸಹ ನಿಮ್ಮ ಚಿಕಿತ್ಸೆಗೆ ಯಾವುದೇ ರೀತಿಯ ದುಷ್ಪರಿಣಾಮಗಳಾಗುವುದಿಲ್ಲವೆಂದು ಈ ಮೂಲಕ ಧೃಢೀಕರಿಸುತ್ತೇನೆ. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವ ನಿರ್ಧಾರ ತಮಗೆ ಬಿಟ್ಟಿದ್ದು. ಈ ಮಾಹಿತಿಯು ಕಾಲೇಜಿನ ಸಮುದಾಯ ವೈದ್ಯ ಶಾಸ್ತ್ರ ವಿಭಾಗದ ಸುರಕ್ಷಿತ ಲಾಕರ್‌ನಲ್ಲಿ ಇಡಲಾಗುವುದು ಹಾಗೂ ಒಂದು ಪ್ರತಿಯನ್ನು ತಮಗೆ ನೀಡಲಾಗುವುದು

ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ ಮುಖ್ಯಅಧ್ಯಯನಗಾರರನನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು.

ಡಾ॥ಭೂಮಿಕಾ ವಿ.

ದೂರವಾಣಿಸಂಖ್ಯೆ: 9481027719

Annexure IV

INFORMED CONSENT FORM

Title of the study: Prevalence of falls, its risk factors and impact on quality of life among elderly living in rural area of Kolar.

I, the undersigned, agree to participate in this study and disclosure of my personal information as outlined in the consent form.

I have been read out/ explained in my local language i.e. in _____ and understand the purpose of this study and the confidentiality of the information that will be collected during the study. I have had the opportunity to ask questions regarding the various aspects of this study and my questions have been answered to my full satisfaction. The information collected will be used only for research.

I understand that I remain free to withdraw from this study at any time. Participation in this study is under my sole discretion and does not involve any cost to me.

Subject's name and signature /thumb impression

Date:

Name and signature of interviewer:

Date:

Principal Investigator: Dr. Bhoomika V

Contact No: 9480127719

Annexure V

INFORMED CONSENT FORM - KANNADA

ತಿಳುವಳಿಕೆ ಪತ್ರ:

ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ: ವಯೋವೃದ್ಧರಲ್ಲಿನ ಬೀಳುವಿಕೆಯ ವ್ಯಾಪಕತೆ ಮತ್ತು ಜೀವನದ ಗುಣಮಟ್ಟ

ಈ ಕೆಳಗೆ ಸಹಿ ಹಾಕಿರುವ ನಾನು ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ಒಪ್ಪಿರುತ್ತೇನೆ ಮತ್ತು ನನ್ನ ವೈಯಕ್ತಿಕ ಮಾಹಿತಿಯ ಬಹಿರಂಗಪಡಿಸುವಿಕೆಯ ಬಗ್ಗೆ ಒಪ್ಪಿರುತ್ತೇನೆ. ನನ್ನ ಮಾತೃ ಭಾಷೆಯಲ್ಲಿ ನನಗೆ ಈ ಅಧ್ಯಯನದ ಬಗ್ಗೆ ಮಾಹಿತಿ ನೀಡಲಾಗಿದೆ/ ನಾನೇ ಸ್ವತಃ ಓದಿರುತ್ತೇನೆ. ಅಂದರೆ ''ವಯೋವೃದ್ಧರಲ್ಲಿನ ಬೀಳುವಿಕೆಯ ವ್ಯಾಪಕತೆ ಮತ್ತು ಜೀವನದ ಗುಣಮಟ್ಟ'' ಮತ್ತು ಈ ಅಧ್ಯಯನದ ಉದ್ದೇಶವನ್ನು ಅರಿತಿದ್ದೇನೆ. ಕಲೆ ಹಾಕುವ ಮಾಹಿತಿಯ ಗೌಪ್ಯತೆ ಹಾಗೂ ಬಳಸುವ ಸಂದರ್ಭದ ಬಗ್ಗೆ ತಿಳಿದಿದ್ದೇನೆ. ಈ ಅಧ್ಯಯನದ ಬಗ್ಗೆ ನನಗಿದ್ದ ಸಂದೇಹಗಳ ಕುರಿತಾಗಿ ಪ್ರಶ್ನಿಸಲು ನನಗೆ ಅವಕಾಶವನ್ನು ನೀಡಲಾಗಿತ್ತು ಹಾಗೂ ಇವರ ಉತ್ತರಗಳಿಂದ ನನಗೆ ತೃಪ್ತಿಯಾಗಿದೆ. ಇಲ್ಲಿ ಸಂಗ್ರಹಿಸಿರುವ ಮಾಹಿತಿಯನ್ನು ಸಂಶೋಧನೆಗೆ ಮಾತ್ರ ಉಪಯೋಗಿಸಲಾಗುವುದು.

ನಾನು ಯಾವುದೇ ಸಂದರ್ಭದಲ್ಲಿ ಈ ಅಧ್ಯಯನದಿಂದ ಹಿಂದೆ ಸರಿಯಲು ಅವಕಾಶವಿದೆ ಮತ್ತು ಇದರಿಂದ ನನ್ನ ಆಸ್ಪತ್ರೆಯ ಆರೈಕೆಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಯ ಉಂಟಾಗುವುದಿಲ್ಲ. ಈಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವುದರಿಂದ ನನಗೆ ಹೆಚ್ಚಿನ ಖರ್ಚು ಬರುವುದಿಲ್ಲ ಮತ್ತು ಇದರಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ನನಗೆ ಯಾವುದೇ ಸಂಭಾವನೆಯನ್ನು ನೀಡಿರುವುದಿಲ್ಲ.

ಪಾಲ್ಗೊಳ್ಳುವವರ ಹೆಸರು ಮತ್ತು ಸಹಿ/ ಹೆಬ್ಬೆರಳಿನ ಗುರುತು: ದಿನಾಂಕ:

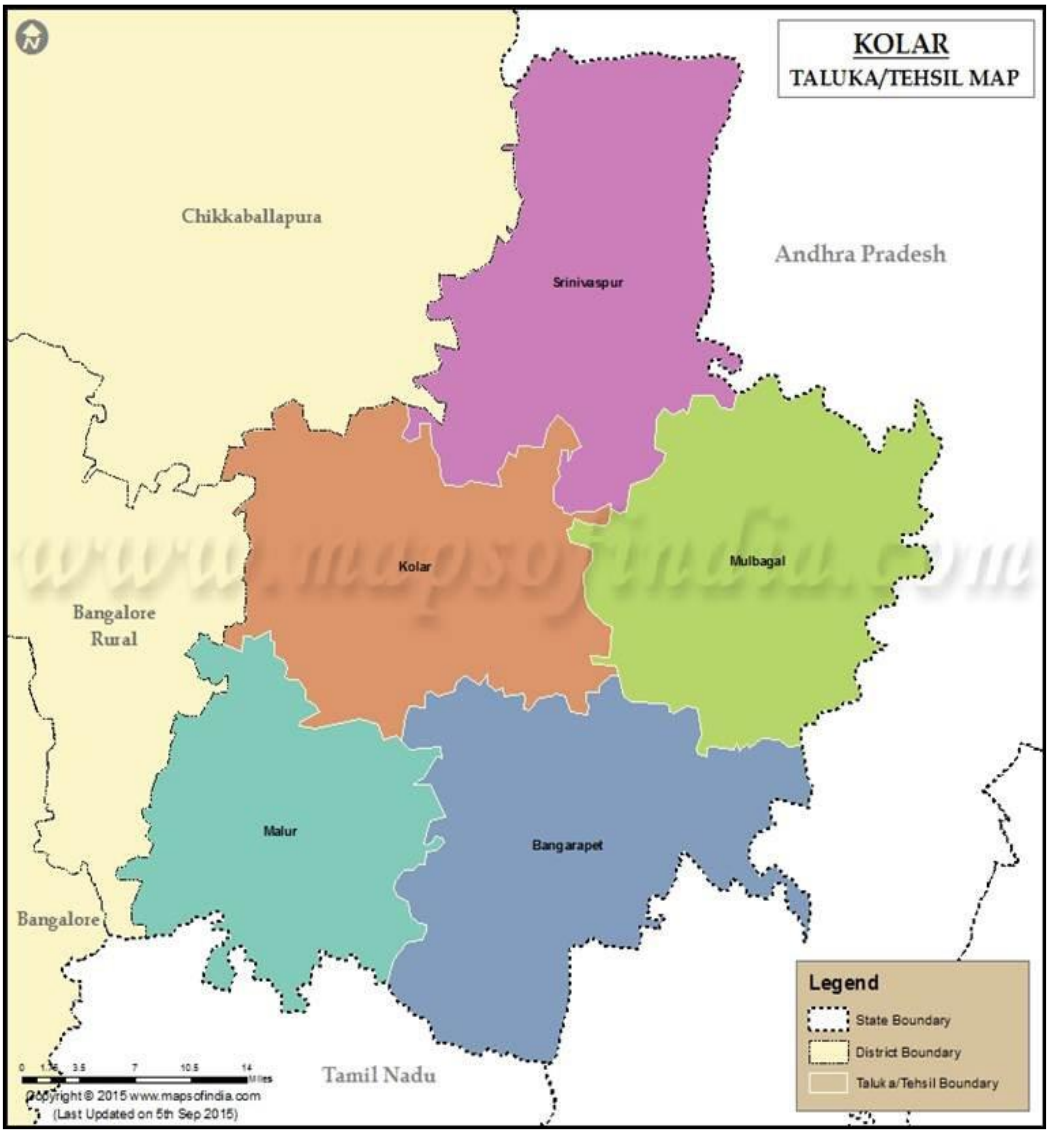
ಹೆಸರು ಮತ್ತು ಸಾಕ್ಷಿ ಸಹಿ ದಿನಾಂಕ:

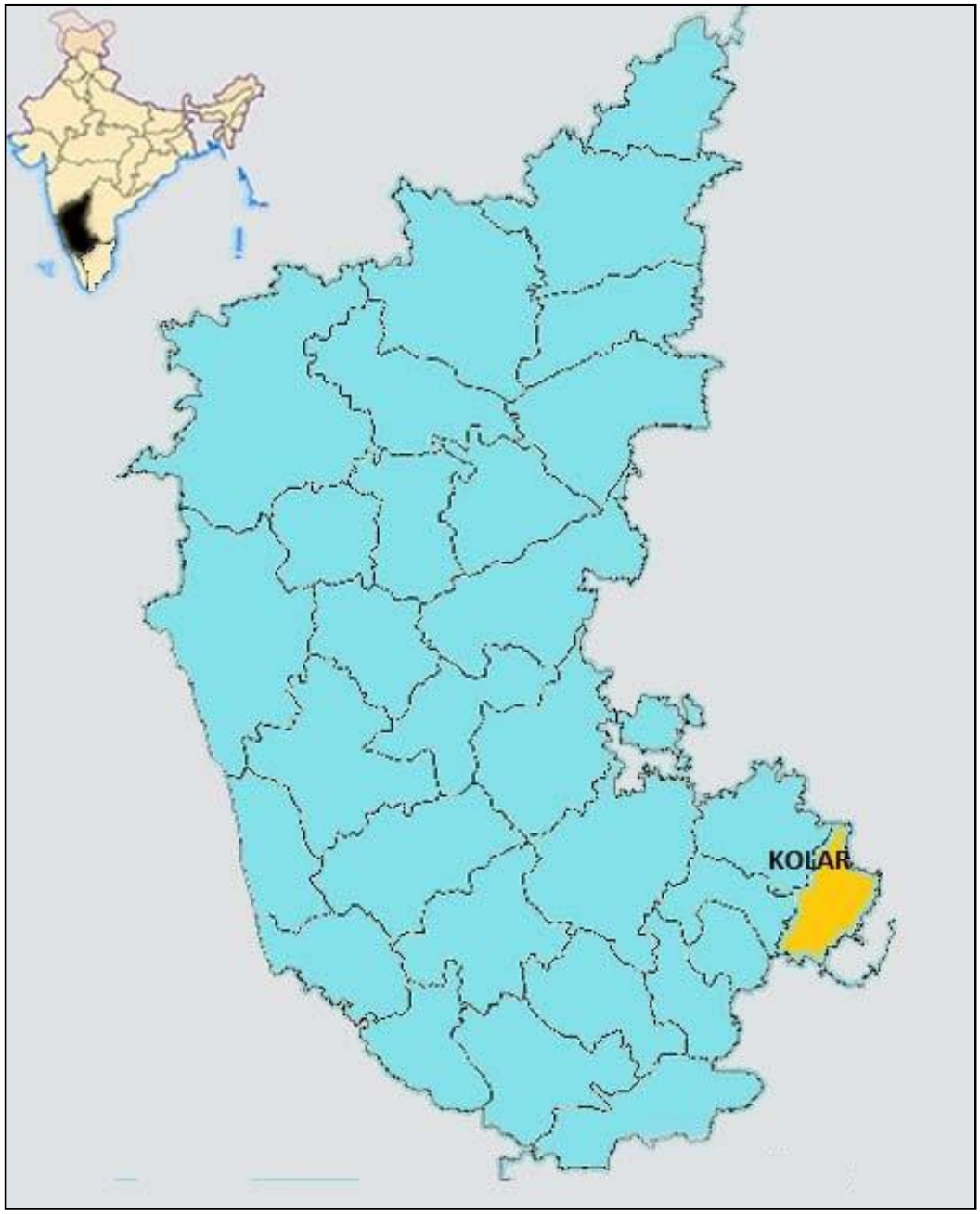
ಸಂದರ್ಶಕರ ಹೆಸರು ಮತ್ತು ಸಹಿ: ದಿನಾಂಕ:

ಪ್ರಧಾನ ತನಿಖಾಧಿಕಾರಿಯ ಹೆಸರು ಮತ್ತು ಸಹಿ: ದಿನಾಂಕ

Annexure VI

MAP SHOWING KARNATAKA STATE AND KOLAR DISTRICT IN KARNATAKA




KOLAR

Annexure VII

Institutional Ethics Committee Certificate

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

SRI DEVARAJ URS MEDICAL COLLEGE

Tamaka, Kolar

INSTITUTIONAL ETHICS COMMITTEE

Members

1. **Dr. D.E.Gangadhar Rao, (Chairman)** Prof. & HOD of Zoology, Govt. Women's College, Kolar,
2. **Dr. Sujatha.M.P, (Member Secretary),** Assoc. Prof. of Anesthesia, SDUMC,
3. Dr. C.S.Babu Rajendra Prasad, Prof. of Pathology, SDUMC
4. Dr. Srinivas Reddy.P, Prof. & HoD of Forensic Medicine, SDUMC
5. Dr. Prasad.K.C, Professor of ENT, SDUMC
6. Dr. Sumathi.M.E Prof. & HoD of Biochemistry, SDUMC.
7. Dr. Bhuvana.K, Prof. & HoD of Pharmacology, SDUMC
8. Dr. H.Mohan Kumar, Professor of Ophthalmology, SDUMC
9. Dr. Hariprasad, Assoc. Prof Department of Orthopedics, SDUMC
10. Dr. Pavan.K, Asst. Prof of Surgery, SDUMC
11. Dr. Talasila Sruthi, Assoc. Prof. of OBG, SDUMC
12. Dr. Mahendra.M , Asst. Prof. of Community Medicine, SDUMC
13. Dr. Mamata Kale, Asst. Professor of Microbiology, SDUMC

No. SDUMC/KLR/IEC/124/2018-19 **Date:29-11-2018**

PRIOR PERMISSION TO START OF STUDY

The Institutional Ethics Committee of Sri Devaraj Urs Medical College, Tamaka, Kolar has examined and unanimously approved the Synopsis entitled **"Prevalence of falls, its risk factors and impact on quality of life among elderly living in rural area of Kolar"** being investigated by **Dr.Bhoomika V** & Dr.Muninarayana C in the Department of Community Medicine at Sri Devaraj Urs Medical College, Tamaka, Kolar. **Permission is granted by the Ethics Committee to start the study**. However, final report has to be submitted to the Ethics Committee after completion of the study for presentation in conference or for publication.

Member Secretary
Institutional Ethics Committee
Sri Devaraj Urs Medical College
Tamaka, Kolar.

Chairman
Institutional Ethics Committee
Sri Devaraj Urs Medical College.
Tamaka, Kolar

Annexure VIII

SOCIO-ECONOMIC STATUS [122]

Modified B.G. Prasad classification was used for socio-economic status for rural and urban families according to per capita income 2019.

Modified BG Prasad classification according to 2019

Socio-economic classification	Social class	Per capita monthly income	
		In 1961	**2019**
Upper class	Ⅰ	≥ 100	≥ 7008
Upper middle class	Ⅱ	50-99	3504-7007
Middle class	Ⅲ	30-49	2102-3503
Lower middle class	Ⅳ	15-29	1051-2101
Lower class	Ⅴ	<15	1050 and below

BG Prasad's classification was based on per capita monthly income. It was introduced with the base of Consumer Price Index (CPI) of 1960 as 100. Which was modified in the year 1982 and 2001, by adding linking factors.

New income value = multiplication factor × old income value × 4.63 × 4.93.

Multiplication factor = Current index value/ Base index value linking factors were 4.93 and 4.63.

Annexure IX

Definition of Variables

OPERATIONAL DEFINITIONS

1. **Age:** The completed age of elderly in years at the time of interview was considered.

2. **Per capita Income:** Per capita income is total family income divided by family size. PCI = Total family income/Family members.[123]

3. **Type of Family:**
    - **Nuclear:** One which is composed of the husband, the wife, the minor children, and direct dependent
    - **Joint:** Composed of two or more couple and their children, including older persons related to them.
    - **Three generation family:** Representatives from three generations residing there among the households.[124]

4. **Occupation:** Engagement in a particular income earning activity for a major part of the day was categorized as main occupation.[125]

Professional	Doctor, Engineer, Principal, Lawyer, Military officer, Senior executive, Business Proprietor, Writer, Scientist, Large employer, Director, University Professor, Police officer, Others (Horse rider)
Semi Professional	Teacher, Pharmacist, Social worker, Owner of small business and manager, Farmer, others (Computer programmer, constructor, Govt employee, Nurse)
Skilled worker	Artisans, clerk, Supervisor, Carpenter, Tailor, Mechanic, Electrician, Railway guard, Painter, Modelor, Smiths, Baker, Driver, Shop assistant, Petty trader, constable, soldier, potter, barber, linesman, others (tinkering, welder, Gardner, cook, mason, postman, plumber)

Semi-skilled	Factory operator, Agricultural labour, shoemaker, security guard, shop helper
Unskilled	Labourer, Domestic servants, peon, sweeper, washerman, others.

Annexure X

Gantt Chart

SL.NO	ACTIVITY	TIME PERIOD												
		2018				2019				2020				
		Aug	Sept	Nov	Dec	Jan	Feb to Mar	April to Aug	Sep to Dec	Jan to June	July to Aug	Aug to Sep	Sep to Oct	Dec
1.	Topic search and selection													
2.	Synopsis submission													
3.	Approval by IEC													
4.	Proforma Preparation and validation													
5.	Pilot project													
6.	Review of literature													
7.	Data collection													
8.	Data analysis													
9.	Dissertation writing													
10.	Submission of dissertation													

Annexure XI

DATA ACQUISITION IMAGES

Questionnaire administration by Investigator

Annexure XII

MASTER CHART

AGEPERSONS	SEXGENDER	EDUEDUCATI	OCCUOCCUPA	MARRYMARIT	INCOMETOTA	CHRDISPRES	CARECAREGI	WALKUSEWAL	TOBTOBACCO	ALCALCOHOL	FALLHAVEYO	TIMESSOTIM	HOWFALLHOW	INJYOUSUFF	TYPINJTYPE	FALPALCEPL	TIMFALTIME	QOLRATEYOU	HEALTHHOWS	PAINPHYSIC	TREATMEDIC	ENJOYHOWMU	LIFEDOYOUF	CONCHOWWEL	SAFEHOWSAF	ENVIHOWHEA	ENERGYDOYO	APPEARYOUA	MONEYHAVEY	INFORMINFO	ACTIVOPPOR	TOGETHOWWE	SLEEPHOWSA	PERFORMABI	WORKHOWSAT	YOURSELFHO	RELATIONHO	SEXHOWSATI	FRIENDSHOW	PLACEHOWSA	SERVICEHOW	TRNSPORTHO	NEGATIVEHO
70	2	0	5	1	10000	0	1	1	1	0	0	0	0	0	0	0	0	2	3	5	4	4	4	4	2	4	4	3	3	2	2	4	4	4	4	4	3	3	2	3	4	4	2
70	2	0	1	3	20000	1	1	1	1	0	0	0	0	0	0	0	0	3	4	5	4	3	4	3	4	4	2	3	4	3	4	4	4	2	3	4	4	3	2	4	2	4	2
70	2	0	1	1	15000	1	1	1	1	0	0	0	0	0	0	0	0	2	2	5	5	3	4	4	2	3	1	4	3	2	3	4	2	2	2	4	5	2	2	4	2	4	3
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60	1	8	5	1	15000	1	1	1	1	0	0	0	0	0	0	0	0	5	4	3	4	4	4	4	3	4	5	4	3	4	3	4	2	4	4	5	4	2	2	4	2	4	1
70	1	5	5	2	25000	1	1	1	1	0	0	0	0	0	0	0	0	4	4	5	5	4	3	4	2	4	2	3	3	2	4	4	5	4	4	5	4	3	2	4	2	4	1
68	1	4	5	1	10000	0	1	1	0	0	0	0	0	0	0	0	0	3	2	4	5	3	3	3	2	4	3	4	3	3	4	4	4	2	2	4	2	2	2	4	2	2	3
65	2	0	5	1	10000	1	1	1	0	0	0	0	0	0	0	0	0	4	4	1	1	4	3	4	3	4	4	3	3	2	4	4	5	4	4	4	2	2	2	4	2	4	2
63	2	0	5	3	10000	1	1	1	1	0	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	1	2	4	2	3	4	4	2	2	3	4	2	2	3	2	2	3
80	1	0	5	1	12000	0	1	1	1	0	0	0	0	0	0	0	0	4	4	3	3	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	5	4	5	4	4	4	1
70	2	0	5	3	10000	0	1	1	1	0	0	0	0	0	0	0	0	4	3	3	4	3	3	4	3	3	3	3	3	1	5	3	4	3	3	3	3	3	4	4	3	3	1
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67	1	0	2	1	15000	1	1	1	1	1	0	0	0	0	0	0	0	3	5	2	2	4	4	4	4	3	3	3	2	2	3	4	5	4	4	4	2	3	4	4	3	4	2
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80	1	0	5	1	15000	1	1	1	1	0	0	0	0	0	0	0	0	4	4	2	4	3	3	4	3	4	3	4	2	3	3	4	1	3	3	4	4	3	4	3	3	3	2
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65	2	0	1	1	5000	1	1	1	1	0	0	0	0	0	0	0	0	3	3	2	3	2	3	3	3	3	3	3	2	2	2	4	4	3	3	3	3	3	4	3	3	3	3
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63	2	0	5	1	30000	0	1	1	1	0	0	0	0	0	0	0	0	5	5	1	2	4	4	3	4	4	5	4	3	4	4	4	5	4	4	4	5	3	4	4	2	4	1
70	1	0	2	1	12000	0	1	1	0	0	0	0	0	0	0	0	0	3	5	3	4	3	2	3	2	3	2	4	3	2	3	4	2	4	4	3	2	2	2	4	4	4	2
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