PREVALENCE OF FRAILTY AND ITS ASSOCIATED RISK FACTORS AMONG ELDERLY PEOPLE IN PANRUTI PHC AREA, TAMILNADU 2018 – A CROSS SECTIONAL STUDY

DISSERTATION

Submitted to

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MAY 2020

CERTIFICATE OF THE GUIDE

This is to certify that the dissertation titled **"Prevalence of Frailty and its associated risk factors among elderly people in Panruti PHC Area, Tamilnadu 2018 – A cross sectional study",** is a bonafide work carried out by **Dr.Malai Ammal .M**, Post Graduate student in the Institute of Community Medicine, Madras Medical College, Chennai-3, under my supervision and guidance towards partial fulfillment of the requirements for the degree of M.D. Branch XV Community Medicine and is being submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai.

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CERTIFICATE

This is to certify that the dissertation titled **"Prevalence of Frailty and its associated risk factors among elderly people in Panruti PHC Area, Tamilnadu 2018 – A cross sectional study"** is a bonafide work carried out by **Dr. Malai Ammal.M,** Post Graduate student in the Institute of Community Medicine, Madras Medical College, Chennai-3, under the guidance of **Dr.M.Vijayalakshmi, M.D.,** towards partial fulfilment of the requirements for the degree of M.D. Branch XV Community Medicine and is being submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai.

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I, solemnly declare that the dissertation titled **"Prevalence of Frailty and its associated risk factors among elderly people in Panruti PHC Area, Tamilnadu 2018 – A cross sectional study"** was done by me **(Register No. 201725002)** under the guidance and supervision of **Dr. M. Vijayalakshmi, M.D.,** Professor, Institute of Community Medicine, Madras Medical College, Chennai-3. The dissertation is submitted to The Tamil Nadu Dr. M.G.R. Medical University towards the partial fulfilment of the requirement for the award of M.D. degree (Branch XV) in Community Medicine.

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ABBREVATIONS

UN	United Nations
WHO	World Health Organization
SAGE	Study on global AGEing and adult health
BP	Blood Pressure
BMI	Body Mass Index
FI	Frailty Index
ADL	Activities of Daily Living
MNA	Mini Nutritional Assessment
GDS	Geriatric Depression Scale
MMSE	Mini Mental State Examination
HUD	Health Unit District
CHC	Community Health Centre
PHC	Primary Health Centre
VHN	Village Health Nurse
SD	Standard Deviation
CI	Confidence Interval
SPSS	Statistical Package for Social Sciences

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Introduction

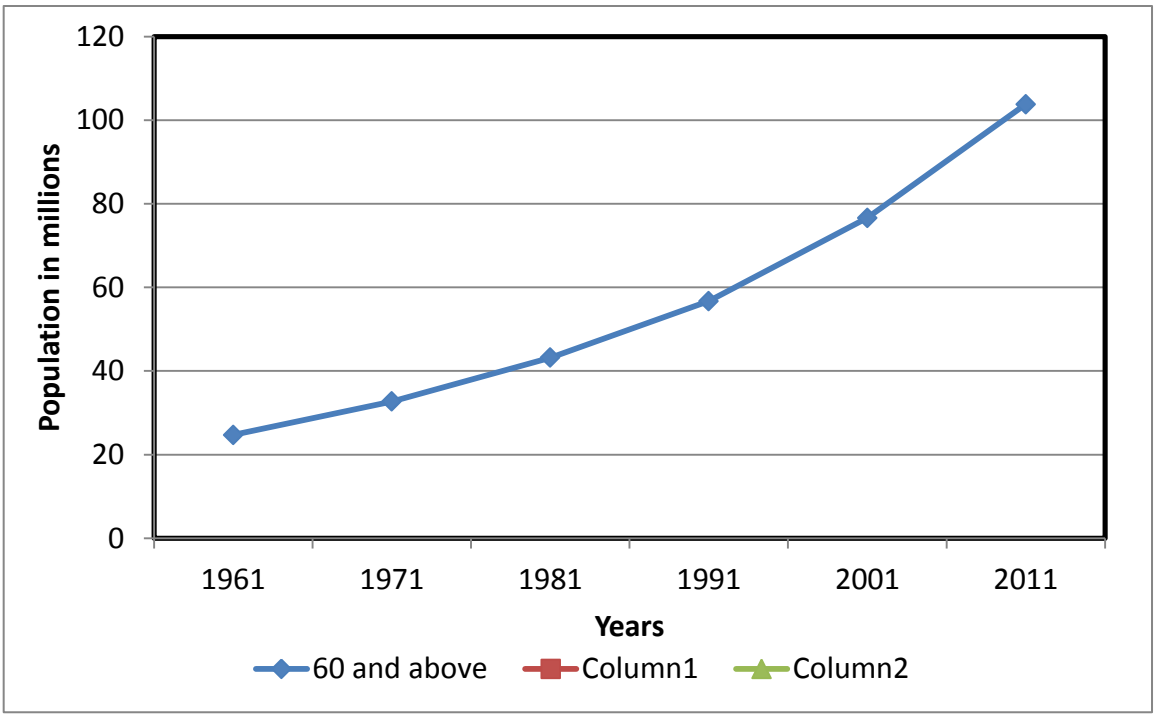
1. INTRODUCTION

Population around the world is rapidly ageing. Longer lives are an incredibly valuable resource, both for individuals and for society more broadly. Older people participate in, and contribute to, society in many ways, including as mentors, caregivers, artists, consumers, innovators, entrepreneurs and members of the workforce. This social engagement may in turn reinforce the health and well-being of older people themselves. Yet the extent of the opportunities that arise from increasing longevity will be heavily dependent on one key factor – the health of these older populations.[1]

Three key demographic changes—declining fertility, reduction in mortality and increasing survival at older ages—contribute to population ageing, which contribute to increase in older adults population. Globally, the 60-plus population constitutes about 11.5 percent of the total population of 7 billion. By 2050, this proportion is projected to increase to about 22 percent when the elderly will out number children (below 15 years of age). In Asia as a whole, the proportion of the elderly is expected to increase from 10.5 percent to 22.4 percent during 2012–2050.[2]

The percentage of the elderly in India has been increasing at an increasing rate in recent years and the trend is likely to continue in the coming decades. The share of population over the age of 60 is projected to increase from 8 percent in 2015 to 19 percent in 2050.

By the end of the century, the elderly will constitute nearly 34 percent of the total population in the country. In Tamilnadu, elderly people constitutes 11.2% of total population according to 2011 census.[2]



According to UN, older people must have

1. Independence –
    a) Older persons should have access to adequate food, water, shelter, clothing and health care through the provision of income, family and community support and self-help.
    b) Older persons should have the opportunity to work or to have access to other income-generating opportunities.
    c) Older persons should be able to live in environments that are safe and adaptable to personal preferences and changing capacities.

2. Participation

a) Older persons should remain integrated in society

b) Older persons should be able to seek and develop opportunities for service to the community and to serve as volunteers in positions appropriate to their interests and capabilities.

3) Care

a) Older persons should benefit from family and community care and protection in accordance with each society's system of cultural values.

b) Older persons should have access to health care to help them to maintain or regain the optimum level of physical, mental and emotional well-being and to prevent or delay the onset of illness.

c) Older persons should be able to utilize appropriate levels of institutional care providing protection, rehabilitation and social and mental stimulation in a humane and secure environment.

4) Self-fulfilment

a) Older persons should be able to pursue opportunities for the full development of their potential.

b) Older persons should have access to the educational, cultural, spiritual and recreational resources of society.

5) Dignity

a) Older persons should be able to live in dignity and security and be free of exploitation and physical or mental abuse.
b) Older persons should be treated fairly regardless of age, gender, racial or ethnic background, disability or other status, and be valued independently of their economic contribution.

1.1 Frailty and Ageing:

Frailty is a geriatric syndrome characterized by weakness, weight loss, and low activity that is associated with adverse health outcomes.Frailty is considered to be highly prevalent with increasing age and to confer high risk for adverse health outcomes, including mortality, institutionalization, falls, and hospitalization.[3]

Frailty is a leading cause of disability. Disability may be defined as a substantial restriction in the capacity of an individual to participate in economic, social or cultural life on account of an enduring, sensory, learning, mental health or emotional impairment."[4]. Worldwide more than 46% of individuals aged 60 years and above have disabilities[5]. According to the 2011 census, the disability rate was 51.8 per 1,000 for the elderly and 84.1 per 1,000 for the 80-plus population as compared to 22.1 per 1,000 of the general population. 80-plus women have higher levels of disability as compared to elderly men indicating greater disadvantages[2].

Frailty has multiple etiologies, of which genes, life style and environment play a pivotal role. Incidence of frailty is higher in advanced age, women and in elders with co-morbidities. Co-morbidities like hypertension, diabetes, Coronary Heart Disease accelerate frailty. And also depression in elderly decreases the brain activity and leading to frailty. Other factors like poor socioeconomic status and lack of family support also increases the chance of frailty.[6]

As age advances, energy requirement decreases leading to decreased food intake which causes macronutrients deficiency but the most dangerous is, it also causes micronutrients deficiency. The risk of fall also increases due to loss of muscle mass and incidence of fractures increases because of decreased bone density.[3] Frailty is the precursor of functional deterioration leading to recurrent hospitalization.[3]

Frailty is associated with advancing age but not all elderly people become frail. Hence, frailty in some parts is reversible and can be intervened.[3] Further studies are needed to explore the prevalence and the associated risk factors of frailty in India.

Justification

2. JUSTIFICATION

Frailty is associated with ageing, co-morbidity and disability. Frailty was an elusive concept earlier despite efforts at consensus. There is now a better understanding of the multisystem dysfunction and the instability involved and an apparent knowledge to identify it early. It can be identified by a multi-domain assessment of function.

According to 2011 census, there are 104 million elderly persons in India. 53 million females and 51 million males. 71% of elderly population resides in rural areas while 29 % is in urban areas.[7]

Around 10% of elderly people who are > 65 years have frailty. Over 25% of them who are > 85 years have frailty.

Frailty is usually considered a pre-disability state which, in contrast to disability, is still amenable to interventions and, hence, reversible.[8] This draws attention to the fact that the governments should make long term commitment in planning and implementing environments considering the welfare of the elderly. Interventions aimed at risk factors may also help prevent conversion of frailty into disability.

Since very few studies have been done in India on frailty, the present study would help to understand the magnitude of the problem and its risk factors in geriatric population and this information shall be used as a tool for planning intervention strategies.

Objectives

3. OBJECTIVES

3.1 Primary objective:

To assess the prevalence of Frailty among elderly people in a PHC area of Kanchipuram District, Tamilnadu.

3.2 Secondary objective:

To identify the risk factors associated with frailty among them in Kanchipuram District of Tamilnadu.

Review of Literature

4. REVIEW OF LITERATURE

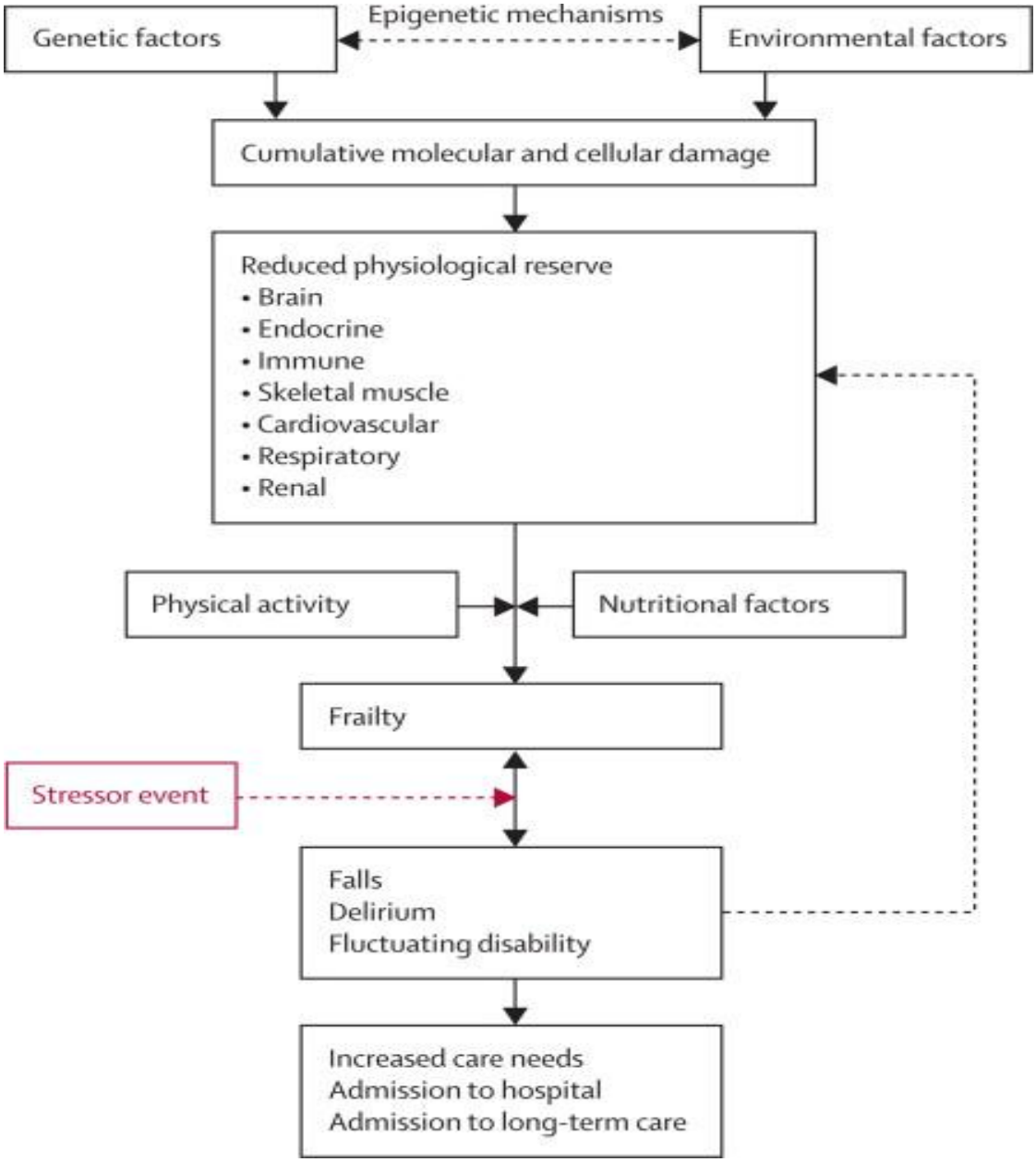
4.1 Introduction:

"Frailty is defined as a clinically recognizable state of increased vulnerability resulting from aging associated decline in reserve and function across multiple systems which compromise the ability to cope with everyday or acute stressors."[9] In the absence of a gold standard, Fried et al defined frailty as meeting three out of five phenotypic criteria i) low grip strength ii) low energy iii) slowed walking speed iv) low physical activity v) unintentional weight loss >3 kg in past three month.

Frailty is a state of increased vulnerability to poor resolution of homeostasis following a stress, which increases the risk of adverse outcomes including falls, delirium and disability. It is a long established clinical expression that implies concern over an older person's vulnerability and prognosis. apparently small insult (e.g. a new drug; "minor" infection; or "minor" surgery) results in a dramatic and disproportionate change in health state: from independent to dependent; mobile to immobile; postural stability to falling; lucid to delirious.[10]

Frailty has been accepted as a diverse syndrome in elderly and increases dependency, hospitalization and decreasing life expectancy. There is an agreement on the fact that frailty should be defined as a composite of multiple factors that are linked to a state of reduced physiological reserve resulting in decreased capacity to withstand environmental stress.

Frailty is usually seen as age-related, biologically vulnerable to stressors and decreased physiological reserves resulting in a limited capacity to maintain homeostasis.[5]



4.2 Frailty models:

Reliable frailty models should be assessed against their success in predicting both natural history and response to therapeutic interventions and be underpinned by biological principles of causality The two principal emerging models of frailty are the phenotype model and the cumulative deficit model underpinning the Canadian Study of Health and Aging (CSHA) Frailty Index.

4.2.1 The phenotype model

In a landmark study, Fried and colleagues[3] undertook a secondary analysis of data obtained from a prospective cohort study (the Cardiovascular Health Study (CHS) involving 5210 men and women aged 65 years and older. A frailty phenotype was operationalised using a cluster of variables: unintentional weight loss; self-reported exhaustion; low energy expenditure; slow gait speed; weak grip strength. The lowest quintile values were used to define absence/presence of these variables. People with Parkinson's disease, previous stroke, cognitive impairment or depression were excluded. People with three of the five factors were considered frail, one or two factors as pre-frail, and no factors as robust older-people.[10]

This phenotypic criteria was being used in the current study.

4.2.2 The cumulative deficit model

The Frailty Index (FI) was developed as part of the CSHA ; a five year prospective cohort study (n=10,263) designed to investigate the epidemiology and burdens of dementia in older people in Canada (mean age: 82 years). Ninety-two baseline parameters of symptoms (e.g. low mood), signs (e.g. tremor) and abnormal laboratory values, disease states and disabilities, collectively referred to as deficits, were used to define frailty .

The FI was a simple calculation of the presence or absence of each variable as a proportion of the total (e.g. 20 deficits out of a 92 gives a FI of 20/92 = 0.22). Thus frailty is defined as the cumulative effect of individual deficits - 'the more individuals have wrong with them, the more likely they are to be frail'[10,11,12]

4.2.3 Other Models[13]:

4.2.2.1 Strawbridge questionnaire:

The questionnaire was developed by Strawbridge in 1998. It defines frailty as difficulty in two or more functional domains (physical, nutritive, sensory and cognitive).

4.2.2.2 Edmonton Frail Scale (EFS):

The EFS studies 8 domains (Cognitive impairment, health attitudes, medication use, social support, nutrition, mood, continence and functional abilities). Maximum score is 17 and it represents the highest level of frailty.

A score between 0 and 3 defines a robust state, a score of 4 or 5 corresponds to the slightly frail state, a score between 6 and 8 denotes the moderately frail state and a score between 9 and 17 corresponding to the severely frail state.

4.2.2.3 Clinical Frailty Scale (CFS):

CSF is based on a clinical evaluation in the domains of mobility, physical activity energy, and function. The CSF scale uses descriptors, figures, icons and to stratify older adults based on their level of vulnerability and the CSF score ranges from 1 (robust health) to 7 (complete functional dependence on others).

4.2.2.4 FRAIL Scale:

The Frail Scale includes 5 components. It considers deficits accumulated in these 5 domains, forming its acronym: Fatigue, Resistance, Ambulation, Illness, and Loss of weight. Frail scale scores range from 0–5 (i.e., 1 point for each component; 0 = best to 5 = worst) and represent frail (3–5), pre-frail (1–2), and robust (0) health status.

4.2.2.5 Groningen Frailty Indicator :

The GFI consists of 15 self-report items and screens for loss of functions and resources in four domains: physical, cognitive, social, and psychological. Scores range from zero (not frail) to fifteen (very frail). A score of GFI of 4 or higher is regarded as frail.

4.2.2.6 Share Frailty Instrument (Share-FI):

Using the five SHARE frailty variables (fatigue, loss of appetite, grip strength, functional difficulties and physical activity), DFactor scores (DFS) were determined using the SHARE-FI formula and based on the DFS value, the subject could then be categorized as non-frail, pre-frail, or frail.

4.2.2.7 Tilburg Frailty Indicator (TFI):

The TFI consists of 2 parts. Part A contains 10 questions on determinants of frailty and diseases (multi-morbidity); part B contains 3 domains of frailty (quality of life, disability, and healthcare utilization) with a total of 15 questions on components of frailty.

The cut off point for frailty is defined as 5 points.

4.2.2.8 The Gérontopôle Frailty Screening Tool:

Two different parts compose the instrument that has been developed as a screening tool. The first one appears as a questionnaire. Its main objective is to attract the general practitioner's attention to very general signs and/or symptoms potentially indicating the presence of an underlying frailty status. In the second part, the general practitioner expresses his/her own view about the frailty status of the individual.

4.3 Global scenario:

In a cohort study, by Fried et al, conducted among 5210 elderly people. The population which was studied was categorised as 7% frail, 47% pre-frail and 46% not frail. People categorised as frail were found to have more adverse outcomes compared to people categorised as not frail. And with the pre-frail group having outcomes intermediate between the two. Mortality when observed at 7 years was 12% for not frail, 23% for pre-frail and 43% for frail groups.[3]

In a study by Buttery et al in Germany, out of 1843 participants, the prevalence of frailty among women was 2.8% and pre-frailty 40.4% and among men frailty was 2.3% and prefrail was 36.9%.[14]

According to a study in rural areas of Andes mountain**,** by Curcio et al, out of the 1,878 participants, 228 (12.2%) were found to be as frail, 996 (53%) as pre-frail, and 654 (34.8%) as non-frail.[15]

In a study by Vu et al, the prevalence of frailty was found to be 35.4% among 461 elderly hospitalized patients in Vietnam. Using the Fried frailty criteria, the percentages of frail, pre-frail and non- frail participants were 35.4%, 40.1 and 24.5 respectively.[16]

Study conducted by Britiwum et al, in China, Ghana, India, Mexico, Russia and South Africa, which was conducted among total of 34,123 respondents. China had the lowest percentages of elder adults with frailty (13.1%) and with disability (69.6%), whereas India had the highest percentages of frailty about 55.5% and disability 93.3%.[17]

4.4 Indian scenario:

A Study on global AGEing and adult health (SAGE), a longitudinal study by WHO between 2007-2010, found that 68.3% of people aged 70 yrs and above in India had difficulty in performing the Activities of Daily Living (ADL).[18] Countries like China, Mexico and South Africa had a better mean Health Score compared to India in individuals aged 60 and above. The Health State score is a composite index of 16 responses from 8 health domains with 0 indicating the worst health and 100 as best health status.

Using the frailty phenotype by Fried et al, Yoelekar found the four year incidence of frailty to be 7.2% in non- institutional community dwelling older adults.[19]

In a cross sectional study in Pune by Kashikar et al, among 250 community dwelling adults, the study observed that the prevalence of frailty in the study population was 26 percent. Pre-frail was 63.6% and non-frail was 10.4 percent.[20]

4.5 TamilNadu scenario:

A hospital based study was conducted in Institute of Geriatrics, Madras Medical College, among 100 randomly selected patients, using Fried's criteria by Chatterjee et al. It is a cross sectional study, in which the participants were selected randomly from geriatric outpatient clinic and inpatient ward of Madras Medical College. Participants with acute illness, severe depression and severe dementia were excluded. Using Fried's criteria the study found that 21% were frail, 20% were Pre frail and 59% were non-frail.[21]

4.6 Factors influencing frailty:

4.6.1. Age:

With increase in age, the prevalence of frailty is also increasing exponentially. And also produces an immense burden on mobility and activities of daily living. According to the English Longitudinal Study of Ageing (ELSA), by Gale et al, conducted among 5450 elderly people aged above 60, prevalence of frailty was 14%. And the prevalence increases with age ranging from 6.5% in 60 – 69 years old people to 65% in people aged above 90 years.[22]

4.6.2. Gender:

Even-though, women's life expectancy is more than men, frailty is more common among women. Even in developed countries, the environment is more adverse for women. Lifestyle factors may increase women's vulnerability to regain health after insults to their system. Gale et al, in a study conducted in United Kingdom, found that the prevalence of frailty is more among women than

men. According to their study, prevalence of frailty was 16% among women versus 12% in men.[22]

In a study conducted in China by Zhang et al, among 1953 participants, prevalence of frailty was 5.4% in men and 8.8% in women.[23]

4.6.3. Education:

According to a study in Seoul, Korea, conducted among 1316 participants, association between level of education and frailty has been observed.($p<0.001$)[24]

4.6.4. Sociodemographic factors:

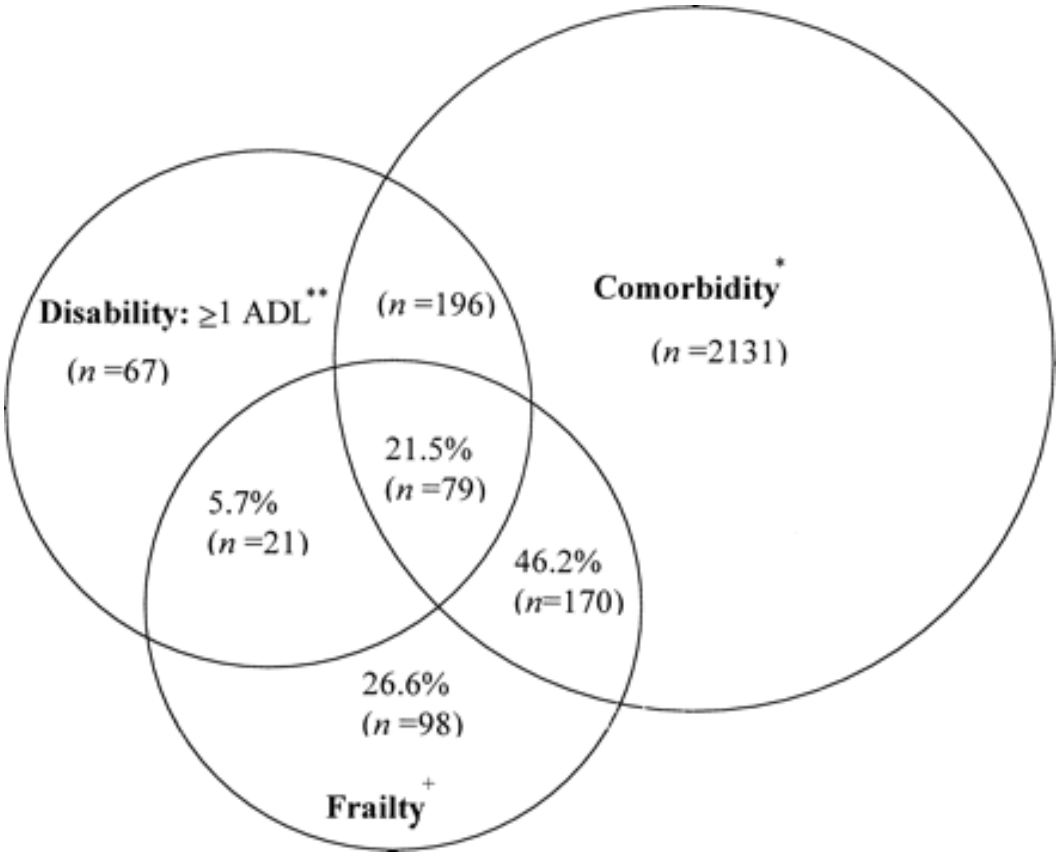
In a study conducted in Germany, by Buttery et al, among 210 participants, whose family status (currently married/single) was found to have association with frailty. (Chisquare value – 9.85, p – 0.02)[15]

4.6.5. Nutritional status:

In an interventional study, done by Nykanen et al, in Finland among 159 community dwelling participants, obserced that after 1 year of nutritional intervention, there was a better outcome of frailty and MNA in the interventional group. Change in MNA was indepentently associated with improved status of frailty. (OR- 1.12, 95% CI 1.03-1.31)[25]

4.6.6. Comorbidities:

In a study by Fried et al, in United States of America, done among 2762 participants, the prevalence and overlaps of Comorbidity, Frailty and Disability among community dwelling adults have been found to be as[26] –



4.6.7 Psychosocial factors:

Psychosocial factors are well known to be linked to frailty. Frail person's psychosocial resources are believed to act as safeguard against adverse outcomes. According to the study by Dent et al, in Australia, in which data was collected from Geriatric Evaluation and Management Unit, Frailty was assessed using Fried's criteria.

Psychosocial factors like sense of control (mastery), social activities, wellbeing, home/neighbourhood satisfaction, social relationships, depression and anxiety were assessed. Frail people with poor psychosocial resources have more likelihood for mortality. (12-month mortality- HR, 95% CI = 3.92, 1.67–9.24)[27]

4.6.8 Cognition:

Cognitive impairment confers an additional risk for developing frailty. In Singapore Longitudinal Ageing Study (SLAS), a population based cohort study, conducted among 2375 Chinese Singaporeans as participants, a 1.8% increased incidence of Frailty and 8.9% increased incidence of prefrailty among cognitively impaired participants were observed. Cognitive impaired participants had 12 to 13 fold increased risk of disability, 27 fold increased risk of low quality of life and 5 fold risk of increased mortality than noncognitively impaired individuals.[28]

4.6.9. Depression:

Depression appears to play a key role in becoming frail in elderly people. Depressive symptoms can cause changes in sleep, physical activity, appetite, reduction in help seeking behavior, and adherence to medical treatments. These psychological and behavior symptoms might lead to decreased energy, weakness, and accelerate declines in physiological systems such as immune system.

In a population based Cohort study in six countries of Latin America (Mexico, Cuba, Venezuela, Puerto Rico, Dominican Republic and Peru) among 12,844 people by Prina et al, found that a 59% increased risk of developing frailty was associated with depression (subdistribution hazardratio [SHR]: 1.59; 95% confidence interval [CI]: 1.40, 1.80)[29]

4.7 Tools for phenotypic criteria:

4.7.1 Mini Nutritional Assessment:

In a study conducted in Frailty clinic in France by Secher et al, it was found that the relationship between BMI and frailty data remains conflicting. Compared with the non frail, normal weight elder adults (BMI 18.6−24.9 kg/m2), pre-frail obese (BMI >30 kg/m2) have a reduction of 16 % ($p<0.001$) in the expected functional limitations rate; frail overweight (BMI 25−29 kg/m2) and obese have a 10% ($p<0.01$) and 36% ($p<0.001$) reduction in the expected functional limitations rate, respectively. Consideration of BMI alone is not an appropriate nutrition screening method in older adults. Poor MNA score is an alert to an individual's vulnerability, and a prompt for further, more-comprehensive assessment.[8]

4.7.2 ADL:

Frailty is associated with high risk of decreased mobility and reduced activities of daily living. According to Soham et al, who conducted a prospective cohory study among 1645 non-institutionalized Mexican Americans, found that

the hazard ratio of activities of daily living disability for pre-frail participants was 1.32 (95% confidence interval 1.10–1.58) and for frail participants 2.42 (95% confidence interval 70–3.46) when compared with not frail subjects. This association remained statistically significant after controlling for potential confounding variables.[30]

4.7.2.1 Katz ADL scale:

Devised by Wallace et al, it assesses the basic activities of daily living. Katz' ADL index demonstrated good internal consistencies for each ethnic group with Cronbach's alphas: 0.84–0.94.[31]

4.7.3 Gait speed:

Walking needs energy, movement control, and support and places demands on multiple organ systems, like the heart, lungs, circulatory, nervous, and musculoskeletal systems. Slowing gait may reflect both a high-energy cost of walking and damaged systems. In many studies, gait speed had been found to be associated with survival of older adults. According to a pooled analysis of 9 cohort studies by Studenski et al , Pittsburgh, data collected from 1986 to 2000, among 34,485 community dwelling adults who were followed up for 6 to 21 years, gait speed was associated with survival of the older adults in all studies (pooled hazard ratio per 0.1 m/s, 0.88; 95% CI, 0.87–0.90; *P*<. 001).Hence, survival increased with gait speeds, with significant increments per 0.1 m/s.[32]

4.7.4 Grip strength:

Muscle weakness leads to poor physical performance and mobility restriction. Weakness is a key element in development of frailty. Hand grip strength is used as a measure to assess weakness. From the study done by Alley et al, University of Maryland, from pooled cross sectional data, weakness based on Hand grip strength was associated with mobility impairment. In men, hand grip strength less than 26 kg and in women less than 16 kg were classified as weak.[33]

Methodology

5. METHODOLOGY

5.1 Study design:

The study was conducted as a community based cross sectional study to assess the prevalence of Frailty among elderly people and to identify the risk factors associated with frailty among elderly people in Panruti PHC area of Kanchipuram District, Tamilnadu.

5.2 Study area:

The community based cross sectional study was conducted in Panruti PHC area of Kanchipuram district in Tamil Nadu, India.

5.3 Study period:

The study was carried out from March 2018 to August 2019.. The data was collected from April 2018 to April 2019 intermittently.

5.4 Study population:

The study population comprised of elderly people both males and females living in the PHC area who are of age 60 years and above.

5.5 Inclusion criteria:

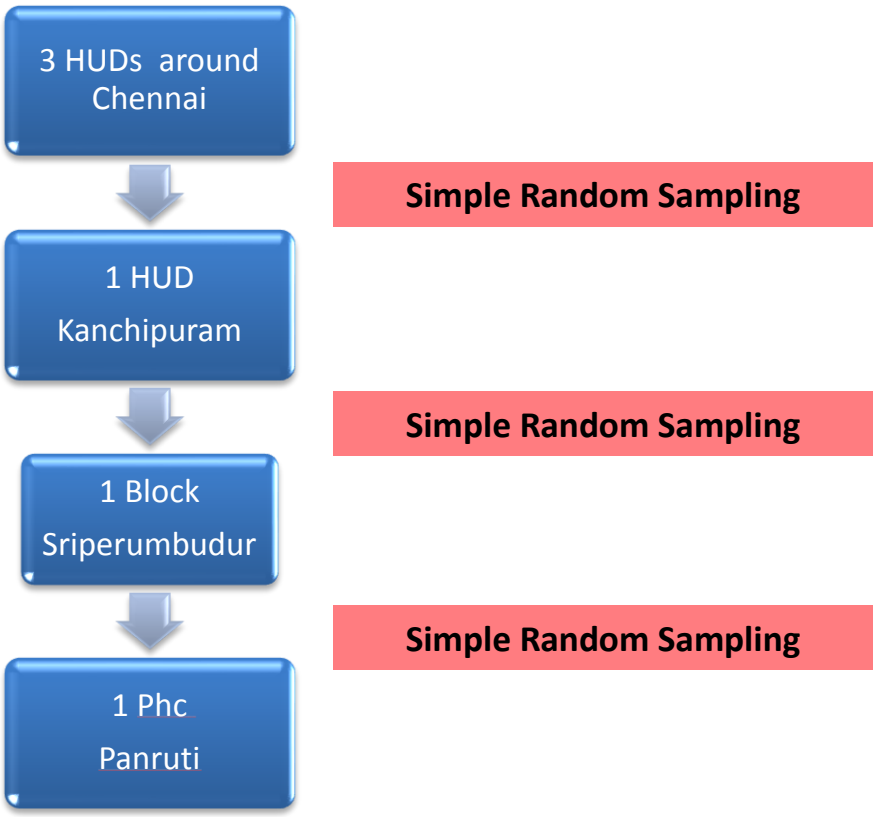
- Those who are ambulant.
- Those who are willing to participate in the study.

5.6 Exclusion criteria:

- Those who do not understand Tamil or English.
- Those who have history of stroke, Parkinson's disease or chronic debilitating disease.

5.7 SAMPLING METHOD:

Multistage sampling



The study area was selected by multistage sampling. Initially, three Health Unit Districts around Chennai were selected namely Thiruvallur, Kanchipuram and Chengalpet. By lot method, Kanchipuram HUD was selected. The HUD has 7 blocks and Sriperumbudur Block was selected randomly. The block has 1 CHC,

Madhuramangalam and 3 additional PHCs – Molachur, Panruti and Vallam GPHCs. Among them, Panruti PHC was selected by lot method. In the selected PHC, list of households were obtained from family registers maintained by VHN. The households were selected by simple random sampling and if the selected households had eligible study participants, they were included in the study after obtaining informed written consent.

Sample size was calculated using the formula:

$$N = \frac{Z_\alpha^2 pq}{d2}$$

Where,

Zα is the standard normal deviate corresponding to 95% confidence interval (=1.96)

p is the proportion of target population estimated to have a particular characteristic, p = 12.2.

q is (100- p) = 87.8

d is the absolute precision of 5%

Sample size is calculated based on the study "Frailty among rural elderly adults- Andes mountains, Colombia," prevalence of frailty is 12.2%,[15] with a 95% confidence and an absolute precision of 5%

Sample size N = 3.84*12.2*87.8/ 5*5 = **166**

5.8 Study tool:

Semi structured pretested questionnaire containing sociodemographic details and assessing,

5.8.1 Frailty - Phenotypic criteria devised by Fried et al.

a) Low grip strength assessed by handheld Dynamometer[33]

- Weakness is assessed by hand grip strength using Dynamometer.
- Maximum strength of dominant hand is assessed.
- Male participants whose hand grip strength <26 kg and female particpants with hand grip strength <16 kg were documented as low grip strength.

b) Slow walking speed assessed by 4m walking speed test[32]

- Walking speed was calculated for each participant using distance in meters and time in seconds.
- Participants whose gait speed <1m/s i.e >4seconds were documented as slow walking speed.

c) Low physical activity by Katz ADL scale[31]

The scale consists of adequacy of performance for six functions without supervision, assistance or direction being given.

1. Bathing - Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.
2. Dressing - Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners.

3. Toileting - Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.
4. Transferring - Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable
5. Continence - Exercises complete self-control over urination and defecation.
6. Feeding - Gets food from plate into mouth without help. Preparation of food may be done by another person.

A score of **1** is given for independence of each function. The score ranges from **0 to 6**.

ADL Score	**Impairment**
5 and 6	**No** impairment
4	**Moderate** impairment
3 and less	**Severe** impairment

d) Low energy by self- declaration of tiredness and

e) Unintentional weight loss by self-declaration using **Mini Nutritional Assessment (MNA scale)**.[34] The scale consists of questions for

1. Decline in food intake –

   0 – Severe decrease in food intake

   1 – Moderate decrease in food intake

   2 - No decrease in food intake

2. Weight loss during past 3 months with

   - 0 point for weight loss more than 3 kg

- 1 point for no knowledge about weight loss.
- 2 points for weight loss between 1 and 3 kg
- 3 points for no weight loss.

3. Mobility-

   0 = bed or chair bound

   1 = able to get out of bed / chair but does not go out

   2 = goes out

4. Psychological stress –

   2 - presence of any psychological stress.

   0 – absence of psychological stress

5. Neuropsychological problems-

   0 – no dementia

   1 – mild dementia

   2 – severe dementia/depression

6. Body Mass Index (BMI)- (weight in kg) / (height in $m)^2$

   0 = BMI less than 19= BMI 19 to less than 21

   1 = BMI 21 to less than 23

   2 = BMI 23 or greater

Total score for MNA is - maximum 14 points.

12-14 Points : Normal nutritional status

0-7 Points : At risk of malnutrition

0-7 Points : Malnourished

5.8.2 2. Assessment of Mental status:

- **Depression by Geriatric Depression Scale (GDS)**[35] –

  Geriatric Depression scale (Short form) had been used to evaluate depression in this study. It consists of 15 questions.

  A score more than **5**, suggests depression.

- **Mental state by Mini Mental State Examination (MMSE)**[36] **or MMSE-I**[37]**.**

  MMSE –

  - 10 points for Orientation
  - 3 points for Registration
  - 5 points for attention and calculation
  - 3 points for recall
  - 9 points for understanding, following, reading and obeying commands

For illiterate participants, MMSE – I was used in which reading was replaced by asking the participants to talk about their house and imitating the interviewer's actions.

Score Ranges for MMSE and MMSE-I

24 – 30	**=**	**Normal**
18 – 23	**=**	**Mild dementia**
10 – 17	**=**	**Moderate dementia**
<10	**=**	**Severe Dementia**

Nature of Frailty:

Frailty assessed by Fried's phenotypic criteria. Based on the number of positive criteria out of 5 criteria, participants were divided into frail, pre-frail and non-frail.

Frail - 3 or more positive criteria.

Pre- frail - 1 or 2 positive criteria.

Non- frail - no positive criteria.

5.8.3 3. Clinical examination :

Height, Weight, Blood Pressure, visual acuity by Snellen's chart were measured.

Procedures for each measurement had been explained prior to recording.

- Standing Height was measured using a stadiometer in centimetres. The measurement was recorded in bare feet and by same stadiometer for all participants.
- Weight was measured using Digital weighing machine in Kilograms. Before weighing, zero marking was ensured each time. Weight was recorded with minimal personal bearings after removing slippers.
- Blood Pressure was measured in the right upper arm, in sitting posture, using sphygmomanometer in mm of Hg by auscultatory and palpatory methods.
- Visual acuity was measured by Snellen's chart.

A value of 6/6 in both eyes were recorded as normal. If either one had visual acuity of <6/6, it was recorded as diminished vision.

5.9 Operational definitions:

Age :

Completed age in years in participants own words was considered at the time of the interview

Sex :

Sex was documented as male, female or transgender

Religion :

Religion was recorded as Hindu, Christian and Muslim as per participants own words.

Educational status:

i. Illiterate –

a person who cannot read or write in any language

ii. Primary school education-

a person who had a formal school education up to fifth standard

iii. Middle school education –

a person who had a formal school education up to eighth standard

iv. High school education-

a person who had a formal school education up to tenth standard

v. Higher secondary school education-

a person who had a formal school education up to twelfth standard

vi. Graduate –

a person who has completed any Degree or a Diploma Course

Marital status:

Marital status comprised of married, single, widowed, divorced/ separated categories.

For analysis, dichotomized as currently married and currently not married.

Source of income:

Source of Income was documented as one of the following

- whether participant
    - Is working
    - His/her spouse working
    - Pension
    - Property
    - Old age pension
    - Children support financially
    - No income.
- Participants who were receiving money from children/ who had no income were classified as economically dependent group.

Life description:

Participant's perception of their life was recorded as

1. Very happy
2. Happy
3. Unhappy
4. Very unhappy.

For analysis purpose, life description was divided as happy and unhappy.

Tiredness:

Self-declaration of tiredness/lack of energy for past one year was documented.

Sleep:

Hours of sleep during night was documented.

Participants who were sleeping for 6 – 8 hours in the night without disturbance were documented as having adequate sleep.

Tobacco user:

Usage of tobacco was documented as

1. Current user of tobacco in any form – smoke/smokeless
2. Previously used tobacco, but currently not.
3. Never used any form of tobacco.

Alcoholic:

Any individual who declared that he consumes alcohol, regardless of the frequency and the type consumed was considered as an alcoholic during the study.

Comorbidities:

Any participant suffering from diseases like Diabetes, Hypertension, Coronary Heart Disease, Chronic Kidney Disease, Tuberculosis, Bronchial Asthma, any disability and any other chronic illness were taken into consideration for the study.

If suffering from any comorbidity, the following history were documented-

- Whether they were taking treatment?
- The facility where they were taking treatment
- The duration of the comorbid condition
- Compliance with their treatment
- Knowledge about their comorbid condition
- Will any of the family members accompany them to hospital?.

Polypharmacy:

Participants taking 5 or more drugs daily were recorded as having polypharmacy.

5.10 Data collection and methods:

After obtaining ethical clearance from the Institutional Ethical committee and permission from the local health authority data was collected.

Pilot study:

Initially pilot study for this study was conducted in Rural Health Training Centre (RHTC), of Madras Medical College. After obtaining informed consent, the questionnaire was validated among 20 participants and necessary changes had been made in the questionnaire based on the experience from pilot study.

Field study:

Panruti PHC which was selected for field study had a population of 23968, 6072 households and 6193 families. List of households were obtained from Family Register maintained by VHNs. The households for the study were selected by simple random sampling. If the selected households had eligible elderly people, after obtaining informed consent, data were collected from the participant using the pre tested semi structured questionnaire in the local language (Tamil) which the participant is able to understand. Questions were read out to the study subjects in exactly the same order as listed in the questionnaire and sufficient time was given to the subjects to respond. If the study subjects haven't understood the question, the question was repeated in the same manner without probing for the answer.

After obtaining the relevant information, anthropometry was measured. Blood pressure and vision were measured after explaining the participants about the procedures.

5.11 Services rendered:

Participants whose blood pressure were high and who require higher level of care were advised to consult nearby Primary Health Centre or Government Hospital at Kanchipuram. Health education was given to the participants and their family members regarding the importance of nutrition, exercise, emotional support, compliance to the treatment, frailty, its progression to disability if left unattended and its implications on psychosocial and economic stress for the older adults and their families.

Data Entry & Analysis

6. DATA ENTRY & ANALYSIS

6.1 Data Entry:

The data obtained from the study participants were entered in Microsoft Excel 2010 and Master Chart framed. The data entered were double checked for any errors. The data from the master chart was exported to Statistical Package for Social Sciences (SPSS) version 16 for analysis.

6.2 Data Analysis:

Continuous variables were presented in the form of descriptive statistics (mean and standard deviation) and categorical variables in the form of frequency distributions and percentages. Association between categorical variables were tested using Chi square tests and Fisher exact tests. Multivariate analysis with binary logistic regression was performed to elucidate the predictors of the dependent categorical variable.

6.3 Data Presentation:

The distributions of categorical data in the study population were represented by tables, pie chart and bar charts.

Results

7. RESULTS

This cross sectional study was conducted among 166 elderly people, of 60 years and above of Panruti PHC area, Kanchipuram, Tamilnadu who were selected by multistage random sampling.

The results were discussed in the following sequence:

I) Sociodemographic Details

II) Morbidity profile

III) Prevalence of Frailty

IV) Factors affecting frailty.

1.1 SocioDemographic Profile:

Table1: Frequency distribution of Socio-demographic details:

S.NO	Variables	Frequency N=166	Percentage %
1.	**Age Group**		
	60-69 years	118	71.1
	70-79 years	34	20.5
	80 years and above	14	8.4
2.	**Gender**		
	Male	55	33.1
	Female	111	66.9

3.	**Education**		
	Illiterate	107	64.5
	Primary	19	11.4
	Middle	16	9.7
	High	12	7.2
	Higher Secondary	5	3.0
	Graduate	7	4.2
4.	**Religion**		
	Hindu	150	90.4
	Christian	12	7.2
	Muslim	4	2.4

Among 166 study participants, 71.1%(118) belonged to age group 60 to 61 years, 20.5%(34) in the age group 70 to 79 years and 8.4%(14) were 80 years and above. with mean age of 66.2 years and standard deviation of 7.3 years. Predominantly, the participants were female. Of the study participants,111 were females (66.9%) and 55(33.1%) were males. Most of them were illiterates (64.5%), 31.1% had school education and 4.2% were graduates. Almost 90% (90.4%) of the participants were Hindus. (Table 1)

Table 2: Frequency Table for Living Conditions:

S.NO	Variables	Frequency N=166	Percentage %
1.	**Marital Status**		
	Never Married	2	1.2
	Married	82	49.4
	Widowed	80	48.2
	Divorced/Separated	2	1.2
2.	**Source of Income**		
	Work/Pension	68	40.9
	Spouse	23	13.9
	OAP	41	24.7
	Children	21	12.7
	Property	8	4.8
	No income	5	3.0
3.	**Living arrangement**		
	Spouse	53	31.9
	Son	69	41.6
	Daughter	16	9.6
	Alone	26	15.7
	Others	2	1.2
4.	**Financial help from children**		
	Never	148	89.2
	Occasionally	2	1.2
	Monthly	16	9.6

Of the study participants, around 49% were staying currently married and 50.6% were widowed/separated/never married. 41% of the participants were either working or receiving pension, around 25% were depending on Old age pension by the Government and 3% had no source of income and were depending on others for their expenses. About 12.7% of the participants were living alone and rest were living with relations mostly with their sons(41.6%). Only 10.8% of the participants were getting financial help from their children either monthly or occasionally and remaining 89.2% were getting no financial help from their children. (Table 2)

Table 3: Frequency distribution of family support and life description:

1.	**Frequency of children visit**		
	Never	10	6.0
	Occasionally	35	21.1
	Monthly	31	18.7
	Weekly	70	42.2
2.	**Accompanying to Hospital**		
	Yes	11	11.5
	No	85	88.5
3.	**Life Description**		
	Very Happy	8	4.8
	Happy	86	51.8
	Unhappy	43	25.9
	Very Unhappy	29	17.5

Only 42.2% of the study participants were being visited by their children weekly and 6% were never being visited by their children. 11.5% were being accompanied by spouse or children to hospital for check up/follow up and remaining 88.5% of the participants were going alone to the hospital. 56.6% described that they are happy with their life and 43.3% described their life as unhappy. (Table 3)

Table 4: Frequency distribution of sleep pattern and personal habits:

1.	**Sleep pattern**		
	Normal	82	49.4
	Reduced	84	50.6
2.	**Tobacco Usage**		
	Current user	26	5.7
	Used, not currently	7	4.2
	Never used	133	80.1
3.	**Alcohol use**		
	No	151	91.0
	Yes	14	9.0

Almost half of the participants(49.4%) said they were having reduced sleep(less than 6 hours of night sleep). Around 5.7% and 4.2% of the participants were current users and previous users of tobacco respectively. Of the participants 9% were drinking alcohol. (Table 4)

7.2 II) MORBIDITY PROFILE:

Table 5: Frequency table of comorbidities:

S. No	Variables	Frequency N=166	Percentage %
1.	**Hypertension**		
	Yes	69	41.6
	No	97	58.4
2.	**Diabetes Mellitus**		
	Yes	58	34.9
	No	108	65.1
3.	**Coronary Heart Disease**		
	Yes	13	7.8
	No	153	92.2
4.	**Vision**		
	Normal	43	25.9
	Decreased	123	74.1
5.	**Polypharmacy**		
	Yes	59	35.5
	No	107	64.5

Among the participants, 41.6% were hypertensive and 58.4% were non-hypertensive. 34.9% were diabetic and 65.1% were non-diabetic. 7.8% were having coronary heart disease. Around 74% were having diminished vision and 25.9% had normal visual acuity. Of the participants 35.5% had polypharmacy (more than 4 drugs). (Table 5)

Table 6: BMI categories according to WHO classification:

S. No	Category	Frequency N=166	Percentage %
1.	Underweight	20	12
2.	Normal	82	49.4
3.	Overweight	45	27.2
4.	Obese	19	11.4

The mean BMI was 24.2 (SD- 4.9). 12% of the study participants were underweight, 49.4% had normal BMI, 27.2% were overweight and11.4% were obese. (Table 6)

Table 7: Nutritional status based on MNA scale:

S. No	Category	Frequency N=166	Percentage %
1.	Normal	82	49.4
2.	At risk of undernourishment	45	27.1
3.	Undernourished	39	23.5

Based on Mini Nutritional Assessment scale, nutritional status of 49.4% of participants were normal, 27.1% were at risk of developing undernourishment and 23.5% were undernourished**.** (Table 7)

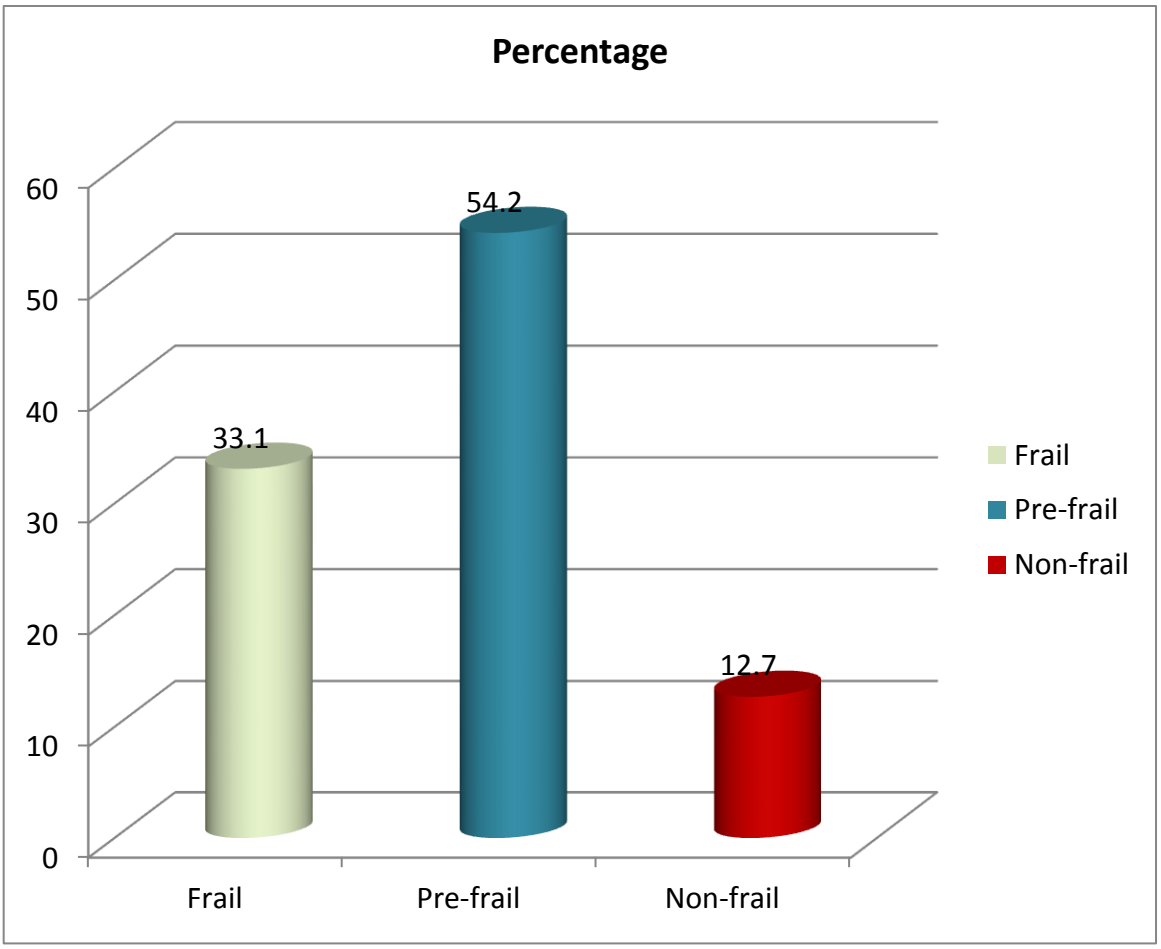
Table 8: Mental status based on GDS and MMSE:

S.No	Category	Frequency N=166	Percentage %
1.	**Depression (GDS)**		
	Normal	95	57.2
	Depressed	71	42.8
2.	**Cognition (MMSE)**		
	Mild Dementia	70	42.2
	Moderate Dementia	12	7.2
	Normal	84	50.6

Among the study participants, according to Geriatric Depression scale(GDS), 42.8% had depression and 57.2% were normal. 49.4% had mild/moderate dementia and 50.6% were normal according to assessment by Mini Mental State Examination(MMSE). (Table 8)

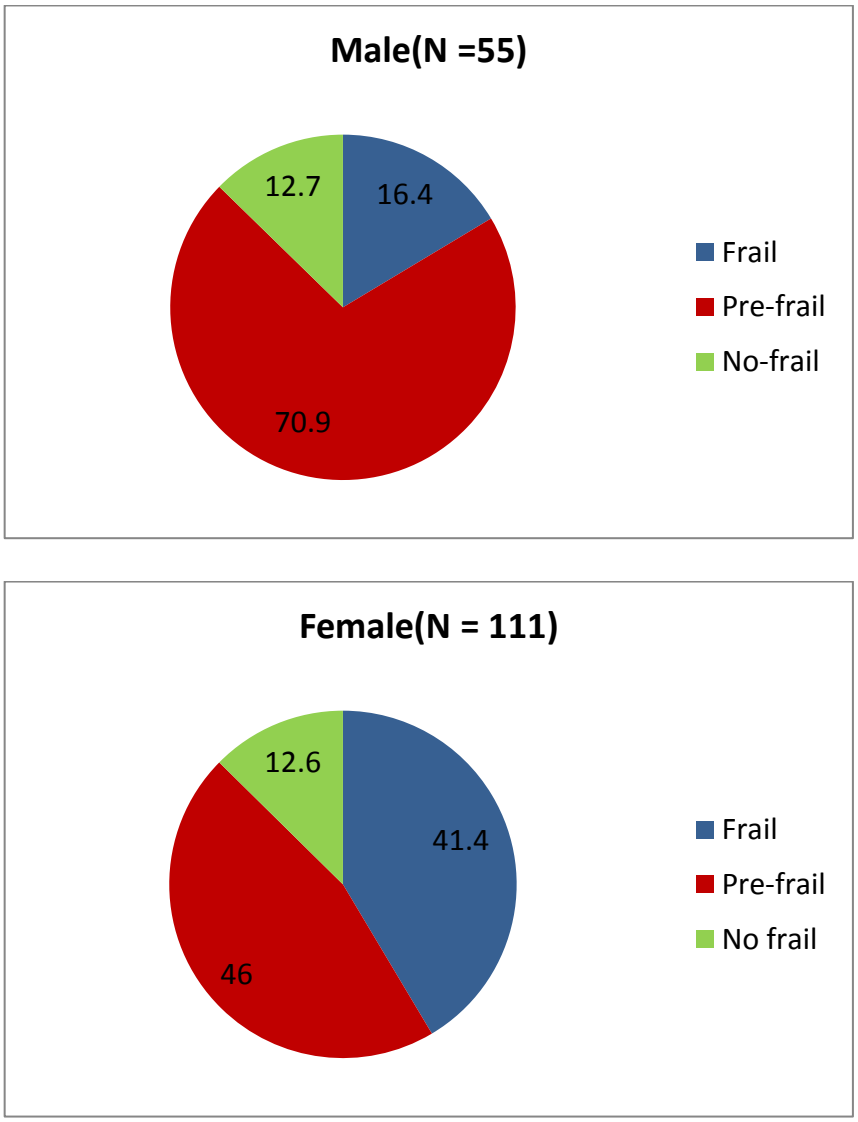
7.3 III) PREVALENCE OF FRAILTY:

Figure 1: Prevalence of Frailty



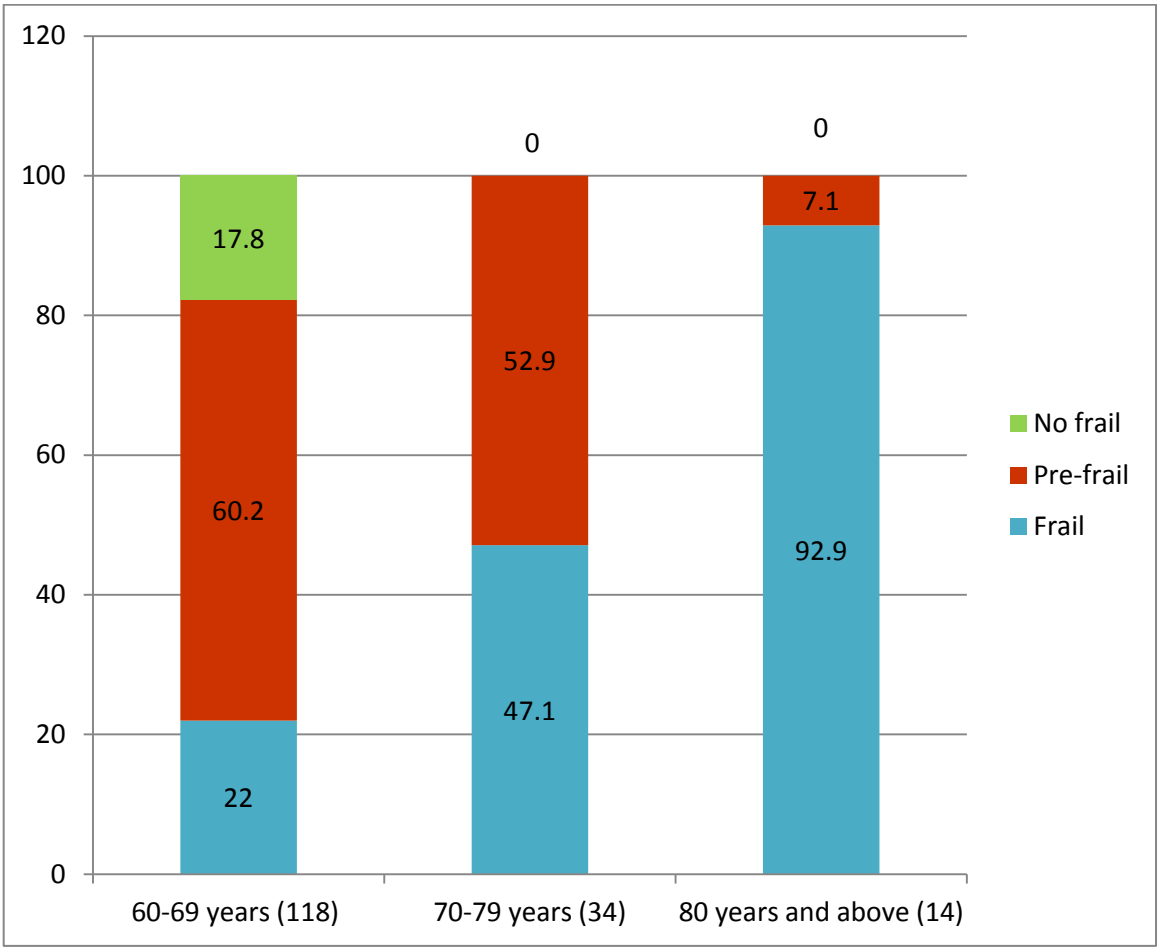
Among the study participants, **33.1%(**55) were **frail**, **54%(**90) were **pre-frail** and **12.7%(**21) were **non frail**. (Figure 1)

Figure 2: Gender wise prevalence of Frailty



Frailty was found to be more prevalent among females in the study. **41.4%** of **female** participants were frail while **16.4%** of males were **frail**. Pre-frailty was more among males(70.9%) than females(45.9%). Around 13% of both males and females were non-frail. (Figure 2)

Figure 3: Age group wise distribution of frailty



Frailty was more prevalent among participants whose age were 80 years and above. Almost **93%** of the participants who age was **80 years and above** were frail. Above 70 years, all of the participants were either frail or pre-frail. In the 60 -69 years age group, 22% were frail.(Figure 3)

7.4 IV. FACTORS INFLUENCING FRAILTY

For bivariate and multivariate analysis, prevalence of frailty was dichotomized as frail and non-frail.

Table 9: Gender vs Frailty

S.No	Gender	Frail	No frail	Chi-square value	p-value
1.	Male	9(16.4)	46(83.6)	10.440	**.001**
2.	Female	46(41.4)	65(58.6)		

Female participants(41.4%) were observed to be having more prevalence of frailty than males(16.4%). Association between gender and prevalence of frailty was found to be statistically significant**(p=0.001)** (Table 9)

Table 10: Association between Age and Frailty:

S.No	Age group	Frail	No frail	p-value
1.	60 – 69 years	26(22)	92(78)	**<0.001** (Fisher Exact)
2.	70 – 79 years	16(47.1)	18(52.9)	
3.	>= 80 years	13(92.9)	1(7.1)	

92.9% of the participants whose age were 80 years and above had frailty and among 60 – 69 years age group 22% were frail with 47.1% frail in 70 -79 years age group. Statistically significant association was found between age group and prevalence of frailty. **(p<0.001).** (Table 10)

Table 11: Level of Education vs Frailty

S.No	Education	Frail	No frail	p-value
1.	Illiterate	45(42.1)	62(57.9)	**.001** (Fisher Exact)
2.	Upto 10^{th} standard	10(21.3)	37(78.7)	
3.	>10 standard	0	12(100)	

21.3% of the participants who had education upto X standard had frailty. Among the participants who had education above X standard, no one were frail. There was a statistically significant association between level of education and prevalence of frailty **(p=0.001).** (Table 11)

Table 12: Marital status vs Frailty

S.No	Marital Status	Frail	Pre-frail	Chi-square value	p-value
1.	Currently Married	14(17.1)	68(82.9)	18.864	**<0.001**
2.	Not currently married	41(48.8)	43(51.2)		

Frailty was more prevalent among participants who were not currently married (48.8%). Amon the participants who were currently staying married 17.1% were frail. The association between marital status and prevalence of frailty was found to be statistically significant.**(p<0.001**)(Table 12)

Table 13: Living arrangement with vs Frailty

S.No	Living arrangement	Frail	No frail	Chi-square value	p-value
1.	Alone	15(57.7)	11(42.3)	8.393	**.004**
2.	With relations	40(28.6)	100(71.4)		

Prevalence of frailty(57.7%) is more among participants who were living alone. Association between the people with whom the participants were living and prevalence of frailty was found to be statistically significant**. (p=0.004)**(Table 13)

Table 14: Economic Independence vs Frailty

S.No	Source of Income	Frail	No frail	Chi-square value	p-value
1.	Economically independent	23(24)	38(54.3)	8.649	**.003**
2.	Economically dependent	32(42.7)	73(76)		

42.7% of the participants who were economically dependent on others had frailty and 24% of economically independent participants were frail. Association between economic independence of the participants and the prevalence of frailty was found to be statistically significant.**(p=0.003)** (Table 14)

Table 15: Life description vs Frailty

S.No	Life description	Frail	No frail	Chi-square value	p-value
1.	Happy	4(4.3)	90(95.7)	8.393	**.004**
2.	Unhappy	51(70.8)	21(29.2)		

Frailty was less prevalent(4.3%) in participants who felt their life was happy than participants who were unhappy(70.8%). The association between the perception of life and prevalence of frailty was found to be clinically significant. **(p=0.004)**(Table 15)

Table 16: Sleep vs Frailty

S.No	Sleep	Frail	No frail	Chi-square value	p-value
1.	Normal	4(4.9)	78(95.1)	58.391	**<.001**
2.	Decreased	51(60.7)	33(39.3)		

Participants who had normal sleep were less frail(4.9%) than participants who had reduced sleep(60.7%). Statistically significant association between hours of sleep of the participants and prevalence of frailty was observed **(p<0.001).** (Table 16)

Table 17: Co-morbidities vs Frailty

S.No	Comorbidity	Frail	No frail	Chi-square value	p-value
1.	Has atleast one comorbidity	29(29.3)	70(70.7)	1.632	.240
2.	No comorbidity	26(38.8)	41(61.2)		

29.3% of the participants who had atleast one comorbidity were frail and 38.8% of the participants with no comorbidity were frail. Prevalance of frailty was not significantly associated with any comorbidity of the aged people (Table 17)

Table 18: Nutritional status vs Frailty

S.No	Nutritional status	Frail	No frail	Chi-square value	p-value
1.	Normal	5(6.1)	77(93.9)	78.592	**<0.001**
2.	At risk	16(35.6)	29(64.4)		
3.	Malnourished	34(87.2)	5(12.8)		

Among the participants who were undernourished, 87.2% were Frail. Association between nutritional status and prevalence of Frailty was found to be statistically significant. **(p<0.001)** (Table 18)

Table 19: Depression vs Frailty

S.No	Depression	Frail	No frail	Chi-square value	p-value
1.	Normal	5(5.3)	90(94.7)	77.868	**<0.001**
2.	Depressed	50(70.4)	21(29.6)		

Participants who were in depression, were more frail(70.4%) than who were normal(5.3%). Statistically significant association had been observed between depression and frailty.**(p<0.001)** (Table 19)

Table 20: Cognition vs Frailty

S.No	Cognition	Frail	No frail	Chi-square value	p-value
1.	Normal	5(6.0)	79(94)	56.703	**<0.001**
2.	Dementia +	50(61)	32(39)		

61% of participants who had dementia were frail. And 6% of participants who were normal had frailty. There was a statistically significant association between cognition status and prevalence of frailty. **(p<0.001)** (Table 20)

Table 21: Vision vs Frailty

S.No	Vision	Frail	No frail	Chi-square value	p-value
1.	Normal	5(11.6)	38(88.4)	12.113	**0.001**
2.	Reduced	50(40.7)	73(59.3)		

Participants with low visual acuity had more prevalence of Frailty(40.7%) than participants with normal vision(11.6%). Association between visual acuity and frailty was observed to be statistically significant.**(p=0.001)** (Table 21)

7.5 Multivariate analysis:

Logistic regression was performed to ascertain the adjusted effects of age, gender, education, marital status, living arrangement, economic independence, life description, sleep, comorbitidites, polypharmacy and vision on Frailty status of the participants.

Table 22: Binary Logistic Regression between variables and prevalence of frailty

S.NO	Variables included	Regression coefficient	P-value	Odds ratio	95% confidence limit	
					Lower	Upper
1.	Agegroup	2.175	.002	8.802	2.200	35.211
2.	Gender	1.473	.039	4.362	1.075	17.708
3.	Lifedescription	3.788	.000	44.176	11.830	164.959
4.	Vision	1.916	.007	6.796	1.681	27.476

The model identifies the following four variables as the most significant variables. i.e. age, gender, life description and vision status.

The adjusted odds of the participants in age group of 80 years and above were 8.802 times more likely to become frail than other age groups. The adjusted odds for female participants to become frail was 4.362 times more than the male participants. The adjusted odds for participants who describe their life as unhappy was 44.176 times more likely to become frail than who describe their life as happy. Participants whose had diminished vision had 6.796 times more odds to become frail than those with normal vision.

Discussion

8. DISCUSSION

The study had been conducted to assess the prevalence of frailty and to identify the associated risk factors for frailty among elderly people of Tamilnadu.

8.1 Sociodemographic characters:

In the study, 71.1% of the participants were between 60 - 69 years of age. The mean age of the participants was 66.2 years. Almost 67% of the participants were females. Most of the participants (64.5%) were illiterate. Majority were following Hinduism. Around 50% were currently married. Most of the participants were working. 10% of the participants were tobacco users. And 9% were alcohol users. In the study of Curcio et al, mean age of the participants was 70.2 years. 52.2% were women and 39% lack formal schooling. 70.7% were below poverty line.[15] Buttrey et al, in Germany observed that 34.8% of the study participants were between were 65 – 69 years of age. 25.7% were in the low socioeconomic status. 9.7% were currently smoking.[14]

8.2 Psychosocial Support:

About 42% of the study participants were living with their sons and 15.7% were living alone. Only 10.8% were receiving financial help from their children. 11.5% of the participants were accompanied by their relations to the hospital for health checkup/follow up. Almost 56% of the participants told they were happy with their life. 50.6% of the participants were having reduced sleep. Dent et al

study in Australia states that 34% were currently married and 61% lives alone.[27] In the study of Buttery et al, 22.8% of the study participants lives alone and 16.5% have poor social support.[14]

8.3 Comorbidities:

In the current study, around 60% had atleast one comorbid condition, 41.6% had hypertension, 34.9% had diabetes and 7.8% had coronary artery disease. 74.1% had diminished vision. 93% of the participants having comorbidity were under regular treatment. Mean BMI was 24.2. 49.4% had normal BMI and 12% were underweight. In the study, Bharathi et al, Puducherry, 47.7% of the participants had hypertension, 43% had diabetes mellitus and 68.2% were visually impaired. 14% were underweight.[38]

8.4 Nutrition and mental status:

In this study, 23.5% were undernourished and 27.1% were at the risk of developing undernourishment according to Mini Nutritional Assessment. Secher et al in their study stated that 9% were undernourished and 43% were at risk of developing malnourishment.[8]

42.8% of the participants of this study were depressed and 49.4% had dementia. In the study in Latin America by Prina et al, 26.9% had depression and 10% had dementia. Curcio et al study observed that 37.7% had depression and 10.9% had dementia.[29,15]

8.5 Prevalence of Frailty:

In the current study, prevalence of **Frailty** among the participants, was found to be **33.1%**, **54.2%** were **pre-frail** and **12.7%** were **non-frail** which were consistent with similar study using similar criteria by Kashirkar et al among 250 community dwelling adults in Pune, Maharashtra stated that the prevalence of frailty was 26%, Pre-frail was 63.6% and Non-frail was 10.4%.[20] But the prevalence of frailty in the current study was found to be lower than the study done in geriatric department of Madras Medical College, in which the prevalence was 21%.[21] The difference in prevalence might be due to different study setting which was a hospital based study and also the participants with acute illness were excluded in the MMC study.

The prevalence of frailty was observed to be more in women in the present study. 41.4% of female participants were frail and 16.4% of men were frail. In the study by Palamo et al, Chile, in which the prevalence of frailty in women 27.1%and in men 19.3% which is in consistent with the present study with increased prevalence among females. [39]

Frailty was observed to be more prevalent in participants who were 80 years and above in the present study. Almost 93% of participants who were 80 years and above were frail but in the study in Germany, by Buttery et al, prevalence of Frailty among older adults above 75 years was stated as 44.1% which was almost half of the prevalence of the current study. The difference might be due to difference in data collection. In Germany study, the data had been

taken from German Health Interview and Examination Survey(DEGS) for adults and the data of adults above 65 years had been included for the study.[14] But in the current study, the age of the participants included were from 60 years and the number of participants above 80 years were also less.

8.6 Factors influencing frailty:

8.6.1 Age:

Age is the main risk factor for many non-communicable diseases like cancer, cardiovascular and neurodegenerative disorders. Age related diseases and the subsequent disability are great challenges to the development of healthy society. Theoretically, frailty is the clinically recognizable state of age-associated decrease in reserve and function of multiple systems. Hence, with increase in age, the older adults are more at the risk of becoming frail. Without proper interventions, it may lead to disability.

In the current study, prevalence of frailty was observed to be increasing with increase in age, from 22% in the age group of 60-69 years to 93% prevalence in the age group of 80 years and above. The association between age and prevalence of frailty was observed to be statistically significant.**($p<0.001$).** Even after adjusting for covariates in the current study, the association between age and frailty were statistically significant demonstrating the influence of age on emergence of frailty. **($p<0.002$, OR = 8.8, CI = 2.2 to 35.2)**

The age related findings of this study is consistent with Curcio et al study, which states that age is strongly associated with frailty($p<0.001$).[15] and also with Palamo et al study which showed strong association between age>75 years and frailty with p-value <0.001.[39]

8.6.2 Gender:

The living environment is not conducive for women even in developed countries. And they are more vulnerable to stochastic subcellular events that increase recovery time. A number of complex and correlated factors determine elder women's health.[40] According to the sustainable development goal 5 which says, gender equality- It is time to build upon hard-won accomplishments of gender and women's health with an expanded social justice perspective. This nuanced exploration of gender represents both our biggest challenge and deepest hope for health, well-being and dignity for all.[41]

Prevalence of frailty among women(41.4%) in this study was found to be more than men. Statistically significant association had been observed between gender and frailty **(p=.001).** this finding is similar to the study by Feng et al in the Singaporian Longitudinal Aging Study (SLAS), with increased prevalence of frailty among women(39.3%, $p<0.001$).[28] The association between gender and frailty was was statistically significant even after adjusting for covariates **(p=0.039, OR 4.362, CI 1.075 to 17.708)**. The increase in prevalence of frailty among female participants might be due to still existing sex roles among the

people where most of the women are housewives, with high burden of domestic role, restricted social life and also with little to no economic independence.

8.6.3 Level of Education:

Health of the elderly is essential for the sustainable development of the society which is ageing. Education plays a vital role and is regarded as a critical factor for functional status transition due to ageing. Many studies have indicated that education had a protective effect on health. Educated elderly people have low levels of mortality and less recovery time from diseases. Elderly people who have higher level of education are likely to allocate health related resources and adopt a healthy lifestyle.[42]

Frailty was more prevalent(42.1%) in participants who didn't had formal school education. There was a statistically significant association between level of education and frailty **($p<0.001$).** This is in concordance with Kim et al study in Seoul, Korea which showed statistically significant association between education and prevalence of frailty. The study conducted in Chile also showed statistically significant association between education and frailty.[39]

Education is a critical factor that exerts far-reaching influence on health status of elderly. Education has both direct effect on health and indirect effect on socioeconomic status of the older adults' health ultimately leading to frailty.

8.6.4 Marital status:

In the present study, the prevalence of frailty was found to be more among participants who were not currently married(48.8%) than participants who were married(17.1%). The association between marital status and prevalence of frailty was found found to be statistically significant**(p<0.001).** This finding was similar to study conducted by Trevisan et al in Italy which also showed statistically significant association between frailty and marital status (p<0.001). Marital status is a social condition that has long been linked with health and functional status. Positive effects of marriage have been demonstrated in many studies in preventing disability.[43]

Widowhood appears to increase the risk of disability, depression and psychological distress are more common among people who were separated. Health status of married people may be better preserved because they are less exposed to risk behavior, and they have more socioeconomic resources and psychological support. Hence the prevalence of frailty might be lesser among people who were currently staying married.

8.6.5 Living arrangement:

Frailty was observed to be more prevalent among participants who were living alone(57.5%) than who were living with relations(28.6). Association between living arrangement and prevalence of frailty was found to be statistically significant **(p<0.004).** This finding is in concordant with the study by Funes et al in France among community dwelling older adults, with prevalence of frailty

among people who lives alone(47.7%) with statistically significant association between living arrangement and frailty($p<0.001$).[44] Older adults who live alone may feel loneliness and social isolation. In those with health problems or sensory deficits, new or worsening symptoms may be unnoticed. Many have difficulty complying with prescribed treatment regimens. Because they have physical limitations and also eating is a social activity, some older people who live alone do not prepare full, balanced meals, making undernutrition a concern. All these factors may lead to development of frailty.

8.6.6 Economic independence:

The participants who were economically independent showed lesser prevalence of frailty(24%) than who were economically dependent on children or those who had no income at all(42.7%). The association between economic dependency and frailty was found to be statistically significant **(p=0.003).** This finding in the current study is less than the prevalence of frailty in economically dependent participants in a study in Germany.(56.7%).[14] The relationship between economic security and health is a well known fact. Poverty is considered to be a risk factor for decline in health especially mental health among elderly people. Income is thought to promote health partly because it increases access to material goods and health services. When the participants had economic independence, it improves their confidence, with better financial security, it also decreases the risk of malnutrition. People with better income is most likely to avail health services at earlier stage of illness and also chance of compliance to treatment is also

more.(SES). Hence the prevalence of frailty among participants with economic independence might be low.

8.6.7 Life description:

Participants who perceived their life as happy had less prevalence of frailty(4.3%) than who told that they were unhappy(70.8%). And the association between life perception and frailty was statistically significant in the current study **(p=0.004).** Even after adjusting for covariates, this association was found to be statistically significant **(p<0.001, OR = 44.176, CI 11.83 to 164.9**). Enjoying their life is a significant contributor of health ageing of older adults. According to National Council for Aging Care, Washington D.C the elderly people who were unhappy were three times as likely to develop issues in their physical activities as their animated counterparts.

It revealed that happy seniors had less trouble getting up, dressing, or taking a shower, as opposed to unhappy seniors who were twice as likely to develop diabetes, heart disease, cancer, and strokes. The enjoyment of life and general happiness are relevant determinants of mobility and future disability in seniors. So in the current study the prevalence of frailty might be more in participants who perceive their life unhappy.

8.6.8 Sleep:

In the present study, participants who had adequate sleep that is 6 to 8 hours in the night were less frail (4.9%) than their counterparts (60.7%) who had less hours of sleep (<6 hours) in night. A statistically significant association between hours of sleep and prevalence of frailty was observed in the study ($p<0.001$). This finding is in consistent with the finding of Piovezan et al study in Brazil which also showed statistically significant association between sleep and frailty.**(p=0.003).**[45] During ageing similar to decrease in body reserve and function, it also affects sleep physiology. Significant changes in sleep pattern occur during ageing. It is now believed that sleep is as important to healthy ageing as diet and exercise. Poor sleep quality is associated with more negative consequences in late-life – like chronic diseases, obesity, depression, suicidality , decrease in ADL etc.

Comorbidities also contribute to sleep disturbances. The relationship between sleep deprivation and comorbidities either directly or indirectly, can progress in the form of vicious cycle leading to gradual deterioration of health. All these factors leading to sleep deprivation which in turn might have contributed to increased prevalence of frailty among participants with decreased sleep.

8.6.9 Comorbidities:

The prevalence of frailty was found to be more among participants who had atleast one comorbidity(38.8) than the participants with no comorbidity(29.3) in this study. But there was no statistically significant association(p=0.240)

between frailty and comorbidities in the current study. However, in the study by Curcio et al, the association between comorbidity and frailty was found to be statistically significant with $p<0.001$.[15] And also in the study in France, statistically significant association between comorbidity and frailty was found.[44]

Comorbidity may contribute atleast additively to frailty. And both frailty and comorbidity can predispose to disability which in turn may exacerbate frailty. Thus, frailty, comorbidity and disability are interlinked. These causal relationships explain for the frequent co-occurrence of these conditions. Also suggest the clinical importance of differentiating them so that appropriate interventions can be applied that could prevent one condition, given that its precursor is present. Each confers specific care in older patients, and the complexity of health care needs and necessity for coordination of multiple providers and services increases with the number of these conditions present. And also prognosis differs for each condition. Simultaneous.

Necessities are to be taken to minimize the severity of multiple chronic diseases, promote the maintenance of function, prevent further functional decline, frailty and loss of independence.

8.6.10 Nutritional Status:

Among the participants of this study, frailty was found to be more prevalent in participants who were malnourished(87.2%) than participants who had normal nutritional status(6.1%). And association between nutritional status and being frail

was found to be statistically significant.**(p<0.001).** This finding is similar to the finding in the study by Nykanen et al in Finland, which also showed that nutritional status was independently associated with frailty.[26]

Promotion of the nutritional health of elderly people might help to prevent adverse health outcomes like institutionalization. Nutritional screening and nutritional invention should be part of standard care among comprehensive geriatric care.

Good nutritional status of elderly people depends on their income, cognition, psychological well being and ability of Instrumental Activities of Daily living especially if they are living alone. Hence even when one of the aforementioned is affected, nutritional status of the elder is also affected and together the factors lead to development of frailty.

8.6.11 Depression:

Frailty was observed to be more prevalent among participants who were depressed (70.4%) than the participants who had no depression(5.3%) in this study.. And also the association between depression and frailty was found to be statistically significant **(p<0.001)**. This finding is in concordance with the study in Colombia which showed statistically significant association between depression and frailty. And also with the study by Prina et al in Latin America, which also showed positive association between depression and prevalence of frailty.[29] The Latin American study observed that about one third of frailty can be attributed to depression in older adults.[16,30]

Even though depression is more common among elderly people, it is not a part of ageing. If left unattended, depression may lead to frailty, disability and cause death. Late life depression and frailty have many overlapping pathophysiological features. Many prospective studies showed that there is a strong association between depression and frailty.[46] It can be told that the relationship between depression and frailty is bidirectional. Depressed elderly people have less interest in taking care of themselves – taking regular treatment for comorbidities, follow up, eating, maintaining social relationship, doing exercise which make them more prone for frailty.

8.6.12 Cognition:

In the current study, participants who had dementia were found to be more frail (61%) than who had normal cognition(6%). This prevalence is higher than that of frailty among cognitive impaired participants of the study(32.6%) by Buttery et al in Germany.[14] The discrepancy might be due to difference in study setting and nature of the population. Statistically significant association had been observed between cognition and frailty in this study **($p<0.001$).** This is similar to the finding in Curcio et al study with positive association between cognition and frailty.[15]

Dementia is devastating and debilitating illness with far reaching public health, social and economic ramifications. When cognitive impairment makes a person more prone for frailty, the reverse is also true. Frailty is an important

independent predictor of dementia. Hence cognitive impairment is also a risk factor and can also be a product of frailty.

8.6.13 Vision:

The current study showed more prevalence of frailty among participants who had low visual acuity(40.7%) than participants with normal visual acuity(11.6%). The association between visual acuity and frailty was observed to be statistically significant **(p=0.001)** and persisted even after adjusting for covariates **(p=0.007, OR = 6.796, CI = 1.681 to 27.476)**. This association is in concordance with the study in Colombia showing strong association between visual impairment and frailty.[16] The study by Doris et al in HongKong also showed association between visual impairment and frailty with more prevalence among participants with low visual acuity(27.8%).

Ageing is an important risk factor for decline in visual acuity. Visual impairment was found to be one of the factors leading to decrease in activities of daily living. And is also one of the contributing factor for frequent falls in elderly which may cause fractures or neurological deficiencies which increase dependency and aggravate frailty. In nonfrail older adults with visual impairment, it doubles the risk of becoming prefrail or frail in the future.[47]

Summary & Conclusion

9. SUMMARY & CONCLUSION

A community based cross sectional study was done to assess the prevalence of frailty and to identify the associated risk factors for frailty among elderly people of Tamilnadu.

The study brings out prevalence of frailty in selected PHC area of Tamilnadu about which very few studies have been documented. Frailty was diagnosed by Fried's phenotypic criteria which consists of i) low grip strength ii) low energy iii) slowed walking speed iv) low physical activity v) unintentional weight loss >3 kg in past three month.

By multistage sampling, Panruti PHC of Sriperumbudur block, Kanchipuram HUD, Tamilnadu was selected as study area. A semi structured pretested questionnaire was used to collect information regarding socio demographic profile, morbidity profile, followed by assessment of physical activity by Katz ADL scale, nutritional status by Mini Nutritional Assessment scale, Depression by Geriatric Depression scale and Cognition by Mini Mental State Examination. Then clinical examination measuring anthropometry, blood pressure and vision was done. Health Education was given regarding the frailty, its prevention and importance was given to the participants.

The study revealed the following findings:

Among the 166 elderly people who participated in the study,

- Prevalence of Frailty was found to be 33.1%
- Female participants were more frail(41.4%) than male participants(16.4%)
- 92.9% of the participants who were of age 80 years and above were frail, 47.1% were frail in the age group 70 – 79 years and 22% were frail in the age group 60 – 69 years.
- Statistically significant association was found between prevalence of frailty and age, gender, level of education, marital status, living arrangement, economic independence, life description, sleep pattern, nutritional status, depression, cognition and vision.
- In binary logistic regression, after adjusting for covariates the following were found to be statistically significant –
    - Age
    - Gender
    - Life description and
    - Vision

Limitations

10. LIMITATIONS

1. The present study being a cross sectional study, brings out the prevalence of frailty. Further longitudinal studies are needed to explore causal association.
2. Subjective factors like tiredness, happiness couldn't be verified.
3. Participants' vision alone tested. Their previous history of any eye surgery were not included.

Recommendations

11. RECOMMENDATIONS

1. Awareness about frailty must be created among medical fraternity. As it involves almost all systems of human body, professionals of all medical fields must be made aware to suspect, screen and diagnose frailty.
2. Comprehensive Geriatric Care addressing all domains of ageing must be implemented from primary health care
3. Separate outpatient services and queue can be provided for geriatric patients in health institutions.
4. Targeted interventions to prevent progression from pre-frail to frail and also from frailty leading to disability must be planned and implemented.
5. Nutritional status of the elderly can be improved by including them in ICDS for supplementary nutrition.
6. Post -menopausal women can be given supplements like calcium, multivitamins to improve their nutritional status.
7. Public places like bus stand, railway station, parks, hospitals must be made geriatric friendly with hand rails, ramps, non-slippery floors, toilets with handholder etc which will encourage elderly people to become ambulant and socialize.
8. Behaviour of neglecting care of parents by their children must be changed.
9. Geriatric recreation club can be promoted in residential areas which will combat depression and improve social life of elderly people.

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Annexures

ANNEXURE - 1

INFORMATION SHEET

"Prevalence of Frailty and its associated risk factors among elderly people in Panruti PHC Area, Tamilnadu 2018 – A cross sectional study"

This study is planned to study the prevalence of frailty in elderly people.

In this study, questions will be asked regarding your Socio demographic details, associated health problems, family support, assessing activities of daily living, nutrition, depression, mental state and hearing. And will be measuring height, weight, BP,visual acuity, walking speed and grip strength.

The privacy of the participants in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time. Your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment or prevention.

Signature of investigator

Date:

Signature of the participant

Date:

ஆய்வுதகவல்தாள்

இந்த ஆய்வில் தங்களுடைய சமூக விவரம்,நாள்பட்ட நோய்களின் விவரம், தங்கள் குடும்பதாரின் ஆதரவு, தங்களின்ஊட்டசத்துநிலை, மனநிலை, தினநடவடிக்கைகள் செய்யும்திறன், கேட்கும்திறன், கேட்கப்படும்.எடை, உயரம், இரத்த அழுத்தம், பார்க்கும்திறன், கைப்பிடியின்வழு, நடக்கும் வேகம் அளக்கப்படும்.

இந்த ஆய்வின் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும் போதோ அல்லது ஆய்வின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிட மாட்டோம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த ஆய்வில் பங்கேற்பது தங்களுடைய விருப்பத்தில் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆய்விலிருந்து வெளியேறலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த சிறப்பு பரிசோதனையின் முடிவுகளை ஆய்வின் பொது அல்லது ஆய்வின் முடிவின் போது தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம் **பங்கேற்பாளர்கையொப்பம்**

தேதி: **தேதி**:

ANNEXURE - 2

INFORMED WRITTEN CONSENT FORM

"Prevalence of Frailty and its associated risk factors among elderly people in Panruti PHC Area, Tamilnadu 2018 – A cross sectional study"

A cross sectional study

Name of the participant: **Age/Sex:**

Study ID No: **Date:**

(1) I have been explained in detail about the study and its procedure. I confirm that I had completely understood the study and have had the opportunity to ask questions

(2) I understand that my participation in the study is voluntary and that I'm free to withdraw at any time, without giving any reason, without their medical care or legal rights being affected.

(3) I understand that the principal investigator, others working on the investigator's behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the trial. I agree to this access. However I understand that my identity will not be revealed in any information released to third parties or published.

(4) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s).

(5) I agree to my participation in the above study.

Signature of investigator Signature of the participant

Date: Date:

ஆய்வுஒப்புதல்கடிதம்

பெயர்: **வயது:** **பால்:**

ஆய்வு சேர்க்கை எண்: **தேதி:**

1. இந்த ஆய்வின் விவரங்களும் அதன் நோக்கங்களும் முழுமையாக எனக்கு தெளிவாக விளக்கப்பட்டது. எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்து கொண்டு நான் எனது சமதத்தைத் தெரிவிக்கிறேன்.
2. இந்த ஆய்வில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில் தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆய்விலிருந்து எந்நேரமும் வெளியேறலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்து கொண்டேன்.
3. இந்த ஆய்வின் விவரங்களை கொண்ட தகவல் தாளை பெற்றுக்கொண்டேன். நான் என்னுடைய சுயநினைவுடன் மற்றும் முழு சுதந்திரத்துடன் இந்த மருத்துவ ஆய்வில் என்னை சேர்த்துக்கொள்ள சம்மதிக்கிறேன்.
4. ஆய்வாளர் மற்றும் அவரை சார்ந்தவர்களோ நெரிமுறைக்குழு உருப்பினர்களோ நான் இந்த ஆய்விலிருந்து விலகினாலும் என்னுடைய அனுமதியின்றி எனது உடல்நிலை குறித்த தகவல்களை இந்த ஆய்விற்கோ இது தொடர்பான வேற ஆய்விற்கோ பயன்படுத்திக்கொள்ள முடியும் என்று புரிந்து கொண்டு சம்மதம் அளிக்கிறேன். ஆனாலும் எனது அடையாளம் வெளியிடப்பட மாட்டாது என்பதை புரிந்து கொள்கிறேன்.
5. இந்த ஆய்வின் தகவல்கலையும் முடிவுகளையும் அறிவியல் நோக்கத்திற்காக பயன்படுத்துவதற்கு நான் அனுமதிக்கிறேன். இந்த ஆய்வில் பங்குப்பெற நான் சம்மதிக்கிறேன்.

ஆராய்ச்சியாளர் கையொப்பம் **பங்கேற்பாளர்கையொப்பம்**

தேதி: **தேதி:**

ANNEXURE - 3

QUESTIONNAIRE

Name:

Address :

Mobile Number:

1) Age:

2) Gender ☐ M ☐F ☐ Transgender

3)Education:

4)Religion: ☐ Hindu ☐ Christian ☐ Muslim ☐ Others

5) Marital status: ☐ Never Married ☐ Married ☐ Widowed/Divorced Separated

6) No of surviving children: ☐ Total ☐ Male ☐ Female

7)With whom are you living? ☐ Spouse ☐ Son ☐ Daughter ☐ Alone

8) Source of income: ☐ Working ☐ Spouse ☐ Pension ☐ Property ☐ Children ☐ Old age pension ☐ Others

9) Approximate monthly income:

10) How often will your children visit you?

11) How often will they help financially and how much?

12) What is your special interests/hobbies?

3) How will you describe your life? ☐ Very happy ☐ Happy ☐ Unhappy ☐ Very unhappy

14) Did you loss any of your immediate family members in past 1 year?

14a)Whom and when?

15) Do you often feel lack of energy or tired in past 1 year?

16) Do you have adequate sleep?

17) Do anybody abuse you physically/mentally?

18) Do you smoke/ use tobacco? ☐ Current user ☐ Not current user ☐ Never

19) Do you consume alcohol?

20) Do you ha ve any associated co-morbidities? ☐ Diabetes mellitus

☐ Hypertension ☐ CHD ☐ CKD ☐ TB ☐ Bronchial asthma

☐ Musculo skeletal disorders ☐ Cancer ☐ Any disability ☐ Others

20a) If yes, for how long do you have the disease?

21) Are you taking treatment for that?

21a) Who will accompany you to the health facility?

22) Is the disease under control?

23) How many number of medicines do you take?

24) Was there any hospitalization/surgery, in past 1 year?

25) Was there any bedridden days in past 1 year?

26) Do you have a history of fall?

26a) If yes, when did you had a fall?

26b) What was the type of injury? ☐ Trivial ☐ Outpatient treatment

☐ Hospitalised, no fracture ☐ Fracturewith/without surgery

ACTIVITIES OF DAILY LIVING:

Katz Index of Independence in Activities of Daily Living(10)		
Activities Points (1 or 0)	**Independence** **(1 Point)** NO supervision, direction or personal assistance.	**Dependence** **(0 Points)** WITH supervision, direction, personal assistance or total care.
BATHING Points: _____	**(1 POINT)** Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	**(0 POINTS)** Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathin
DRESSING Points: _____	**(1 POINT)** Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	**(0 POINTS)** Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	**(1 POINT)** Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	**(0 POINTS)** Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	**(1 POINT)** Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	**(0 POINTS)** Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: _____	**(1 POINT)** Exercises complete self-control over urination and defecation.	**(0 POINTS)** Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	**(1 POINT)** Gets food from plate into mouth without help. Preparation of food may be done by another person.	**(0 POINTS)** Needs partial or total help with feeding or requires parenteral feeding.
TOTAL POINTS: _____ SCORING: 6 = Independent, 3 to 5 = moderate impairment, 2 or less = severe functional impairment.		

NUTRITIONAL STATUS:

MINI NUTRITIONAL ASSESSMENT(11) :

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? 0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake
B Weight loss during the last 3 months 0 = weight loss greater than 3 kg (6.6 lbs) 1 = does not know 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs) 3 = no weight loss
C Mobility 0 = bed or chair bound 1 = able to get out of bed / chair but does not go out 2 = goes out
D Has suffered psychological stress or acute disease in the past 3 months? 0 = yes 2 = no
E Neuropsychological problems 0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems
F1 Body Mass Index (BMI) (weight in kg) / (height in m)^2 0 = BMI less than 19 1 = BMI 19 to less than 21 2 = BMI 21 to less than 23 3 = BMI 23 or greate
Screening score (max. 14 points) 12-14 points: Normal nutritional status 8-11 points: At risk of malnutrition 0-7 points: Malnourished

EVALUATION OF DEPRESSION:

Geriatric Depression Scale (GDS) Short Form(12):

Choose the best answer for how you have felt over the past week:		
1	Are you basically satisfied with your life?	Yes/No
2	Have you dropped many of your activities and interests?	Yes/No
3	Do you feel that your life is empty?	Yes/No
4	Do you often get bored?	Yes/No
5	Are you in good spirits most of the time?	Yes/No
6	Are you afraid that something bad is going to happen to you?	Yes/No
7	Do you feel happy most of the time?	Yes/No
8	Do you often feel helpless?	Yes/No
9	Do you prefer to stay at home rather than going out and doing new things?	Yes/No
10	Do you feel you have more problems with memory than most?	Yes/No
11	Do you think it is wonderful to be alive now?	Yes/No
12	Do you feel pretty worthless the way you are now?	Yes/No
13	Do you feel full of energy?	Yes/No
14	Do you feel that your situation is hopeless?	Yes/No
15	Do you think that most people are better off than you are?	Yes/No

Scoring for Geriatric Depression Scale:

- Score 1 point for every “yes” in questions 2, 3, 4, 6, 8, 9, 10, 12, 14, 15
- Score 1 point for every “no” in questions 1, 5, 7, 11, 13

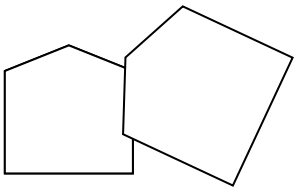
A total score greater than 5 suggests depression

Mini-Mental State Examination (MMSE)(13)

Maximum Score	**Score**	
		ORIENTATION
5	( )	What is the (year), (season), (date), (day), (month)
5	( )	Where are we (state), (county), (town or city), (hospital), (floor)
		REGISTRATION
3	( )	Name 3 common objects, (e.g. ‘apple’, ‘table’, ‘penny’). Take 1 second to say each. Then ask the patient to repeat all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he/she learns all 3. Count trials and recordTrials:
		ATTENTION AND CALCULATION
5	( )	Spell ‘world’ backwards. The score is the number of letters in the correct order (D__ L__ R__ O__ W__)
		RECALL
3	( )	Ask for the 3 objects repeated above. Give 1 point for each correct answer. [Note: recall cannot be tested if all 3 objects were not remembered during registration.]
		LANGUAGE
2	( )	Name a ‘pencil’ and ‘watch’ (2 points)
1	( )	Repeat the following “No, ifs, ands, or buts”(1 point)
3	( )	Follow a 3-stage command: ‘Take a paper in your right hand, Fold it in half, and Put it on the floor’ (3 points)

Read and obey the following:

1	( )	Close your eyes(1 point)
1	( )	Write a sentence(1 point)
1	( )	Copy the following design(1 point)



Score Ranges
24 – 30 Normal
18 – 23 Mild dementia
10 – 17 Moderate dementia
<10 Severe Dementia

Total Score_____

1.1 CLINICAL EXAMINATION:

Height (in cm):

Weight (in kg):

BP (in mm of Hg):

Hearing:

Visual Acuity:

Grip strength using Dynamometer:

Four meter walking speed test :

இணைப்பு

கேள்வித்தாள்
பெயர்:

முகவரி :

கைபேசி எண்:

பிரிவு 1: பொதுவான
1) வயது:

2) பாலினம்: ◻ ஆண் ◻ பெண் ◻ திருநங்கை

3) கல்வி:

4) மதம்: ◻ இந்து ◻ கிறிஸ்துவர் ◻ முஸ்லீம் ◻ மற்றவர்கள்

5) திருமணத் தகுதி: ◻ ஒருபோதும் திருமணமாகாதவர் ◻
திருமணமானவர் ◻ துணையிழந்தவர்/விவாகரத்தானவர்/பிரிந்திருப்பவர்

6) உயிருடன் இருக்கும் குழந்தைகளின் எண்ணிக்கை ? ◻ மொத்தம்
◻ ஆண் ◻ பெண்

7) யாருடன் நீங்கள் வாழ்ந்து வாழ்கிறீர்கள்? ◻ வாழ்க்கைத் துணை
◻ மகன் ◻ மகள் ◻ தனியாக

8) வருமான ஆதாரம்: ◻ வேலை ◻ வாழ்க்கைத் துணை
◻ ஓய்வூதியம் ◻ சொத்து ◻ குழந்தைகள் ◻ முதியோர் ஓய்வூதியம்
◻ மற்றவை

9) தோராயமான மாத வருமானம்:

10) எவ்வளவு நாட்களுக்கு ஒருமுறை உங்கள் குழந்தைகள் உங்களை வந்து பார்பார்கள்?

11) எப்பொழுதெல்லாம் பணம் தருவார்கள்? எவ்வளவு தருவார்கள்?

12) உங்கள் சிறப்புத் தகுதிகள் / பொழுதுபோக்குகள் என்ன?

13) உங்கள் வாழ்க்கையை எப்படி உணர்கிறீர்கள்? ◻ மிகவும் சந்தோஷமாக
◻ சந்தோஷமாக ◻ வருத்தமாக ◻ மிகவும் வருத்தமாக

14) கடந்த ஒரு ஆண்டில் உங்கள நெருங்கிய குடும்ப உறுப்பினர்கள் யாரையும் இழந்துள்ளீர்களா?

14A) யாரை இழந்துள்ளீர்கள்? எப்பொழுது?

15) கடந்த ஒரு ஆண்டில் சோர்வாக உணர்கிறீர்களா?

16) உங்களுக்குப் போதுமான தூக்கம் இருக்கிறதா?

17) உங்களை யாராவது உடல்/மனரீதியாகத் துன்புறுத்துகிறார்களா?

18) உங்களுக்குப் புகைப்பழக்கம் / புகையிலைப் பழக்கம் உள்ளதா?

□ தற்போது பயன்படுதுபவர் □ முன்னர் பயன்படுதியவர்

□ பயன்படுததியதில்லை.

19) நீங்கள் மது அருந்துவீர்களா?

20) உங்களுக்கு நாட்பட்ட நோய் ஏதேனும் உள்ளதா? □ நீரிழிவு நோய்

□ உயர் இரத்த அழுத்தம் □ இருதய நோய் □ சிறுநீரக நோய்

□ காசநோய் □ ஆஸ்துமா □ தசை மற்றும் எலும்புக்

கோளாறுகள் □ புற்றுநோய் □ ஏதேனும் இயலாமை □ மற்றவை

20a), ஆம் எனில் எவ்வளவு காலம்?

21) நீங்கள் அதற்குச் சிகிச்சை எடுத்து வருகிறீர்களா?

21a) உங்களுடன் மருத்துவமனைக்கு யார் வருவார்கள்?

22) நோய் கட்டுப்பாட்டில் உள்ளதா?

23) நீங்கள் எத்தனை மருந்துகள் எடுத்துக்கொள்கிறீர்கள்?

24) கடந்த ஒரு ஆண்டில் மருத்துவமனையில் சேர்ந்தோ / அறுவை சிகிச்சையோ நடந்ததா?

25) கடந்த ஒரு ஆண்டில், நோயினால் படுக்கையில் இருந்த நாட்கள் எத்தனை?

26) நீங்கள் எப்பொழுதவது கீழே விழுந்துள்ளீர்களா?

26A) ஆம் எனில், எப்பொழுது?

26b) என்ன காயம் ஏற்பட்டது? □ இலேசான காயம் □ வெளிநோயாளர்

சிகிச்சை □ உள்நோயாளியாக, அறுவை சிகிச்சை இல்லாமல்

□ எழும்புமுறிவு அறுவை சிகிச்சை இல்லாமல்/ உடன்

அன்றாட வாழ்க்கை நடவடிக்கைகள்:

அன்றாட வாழ்க்கையின் செயல்பாடுகள் - கட்ஸ் குறியீட்டு		
நடவடிக்கைகள் புள்ளிகள் (1 அல்லது 0)	**தற்சார்பு** (1 **புள்ளி**) எந்த மேற்பார்வையும் இல்லாமல்,	**பிறரைச் சார்ந்திருத்தல்** (0 **புள்ளிகள்**) மேற்பார்வையில், அல்லது உதவியுடன்
குளித்தல் புள்ளிகள்:: _____	(1 **புள்ளி**) தானே குளித்துக் கொள்கிறார். முதுகு, செயலிழந்தப் பகுதிக்கு மட்டும் உதவி தேவை.	(0 **புள்ளிகள்**) , குளிப்பதற்கு உதவி தேவை.
உடை அணிதல் புள்ளிகள்:: _____	(1 **புள்ளி**) அலமாரியில் இருந்து உடையினை எடுத்துத் தானே அணிந்து கொள்கிறார்.	(0 **புள்ளிகள்**) உடை அணிய உதவி தேவை.
கழிவறை உபயோகித்தல்: புள்ளிகள்:: _____	(1 **புள்ளி**) , உதவியேதுமில்லாமல் தானே பார்த்துக் கொள்கிறார்.	(0 **புள்ளிகள்**) கழிவறை செல்ல உதவி தேவை
நகர்தல் புள்ளிகள்:: _____	(1 **புள்ளி**) கட்டில் மற்றும் நாற்காலியில் இருந்து தானே நகர்ந்து கொள்கிறார்.	(0 **புள்ளிகள்**) நாற்காலி அல்லது படுக்கையில் இருந்து நகர உதவி தேவை .
சுயகட்டுப்பாடு புள்ளிகள்:: _____	(1 **புள்ளி**) சிறுநீர் மற்றும் மலம் கழித்தலில் முழுமையான சுயகட்டுப்பாடுடன் இருக்கிறார்.	(0 **புள்ளிகள்**) சிறுநீர் மற்றும் மலம் கழித்தலில் சுயகட்டுப்பாடு இல்லை.
உணவு உட்கொள்ளல் புள்ளிகள்:: _____	(1 **புள்ளி**) உதவி இல்லாமல் தட்டில் இருந்து உணவு உட்கொள்கிறார்.	(0 **புள்ளிகள்**) உணவு உட்கொள்ள உதவி தேவை.
மொத்தப் புள்ளிகள்: _____: 6 =, தற்சார்பு 3 - 5 = மிதமான செயல்பாட்டுக் குறைபாடு, 2 அல்லது குறைவாக = கடுமையான செயல்பாட்டுக் குறைபாடு		

ஊட்டச்சத்து:

மினி ஊட்டச்சத்துக் மதிப்பீடு

பசியின்மை, செரிமான பிரச்சினைகள், மெல்லும் அல்லது விழுங்கும் பிரச்சினைகள் காரணமாக உட்கொள்ளும் உணவின் அளவு கடந்த 3 மாதங்களில் குறைந்துள்ளதா? 0 = கடுமையான குறைவு 1 = மிதமான குறைவு 2 = உணவு உட்கொள்ளலில் குறைவு இல்லை
கடந்த 3 மாதங்களில் எடை இழப்பு உள்ளதா? 0 = எடை இழப்பு 3 கிலோவிற்கு அதிகமாக (6.6 பவுண்ட்) 1 = தெரியாது 2 = எடை இழப்பு 1 மற்றும் 3 கிலோவிற்கு இடையே (2.2 மற்றும் 6.6 பவுண்ட்) 3 = எடை இழப்பு இல்லை
நடமாட்டம் 0 = படுக்கையில் அல்லது நாற்காலியில் பிணைப்பு 1 = படுக்கையில் / நாற்காலியில் இருந்து எழ முடியும் ஆனால் வெளியே செல்ல முடியாது 2 = வெளியே செல்ல முடியும்
கடந்த 3 மாதங்களில் மன அழுத்தம் அல்லது கடுமையான நோயினால் பாதிக்கப்பட்டுள்ளீர்களா? 0 = ஆம் 2 = இல்லை
நரம்பு உளவியல் பிரச்சினைகள் உள்ளதா? 0 = கடுமையான டிமென்ஷியா அல்லது மனஉளைச்சல் 1 = லேசான டிமென்ஷியா 2 = உளவியல் பிரச்சினைகள் இல்லை
உடல் நிறை குறியீட்டெண் (பிஎம்ஐ) (கிலோ எடை) / (மீ உயரம்) ^{2} 0 = பிஎம்ஐ <19 1 = பிஎம்ஐ 19 - 21 2 = பிஎம்ஐ 21 - 23 3 = பிஎம்ஐ >=23
மதிப்பெண் (அதிகபட்சம். 14 புள்ளிகள்) 12-14 புள்ளிகள்: இயல்பான ஊட்டச்சத்து நிலை 8-11 புள்ளிகள்: ஊட்டச்சத்து ஏற்படக்கூடும் 0-7 புள்ளிகள்: ஊட்டச் சத்து குறைபாடுள்ளது

மன அழுத்த மதிப்பீடு:`

மனநிலை தேர்வு (MMSE)

அதிகபட்ச மதிப்பெண்	மதிப்பெண்	
		திசைப்போக்கு
5	()	என்ன (ஆண்டு), (பருவம்), (தேதி), (நாள்), (மாதம்)
5	()	நாம் எங்கே இருக்கிறோம் (மாநிலம்), (கவுண்டி), (மாநகரம் அல்லது நகரம்), (மருத்துவமனை), (தளம்) உள்ளன
		பதிவு
3	()	பெயர் 3 பொருட்களின் பெயர்களைக் கூற வேண்டும். , (எ.கா. 'ஆப்பிள்', 'அட்டவணை', 'பென்னி'). ஒரு பெயர் சொல்ல 1 வினாடி எடுத்துக்கொள்ள வேண்டும். பிறகு நோயாளியைக் கேளுங்கள். ஒவ்வொரு சரியான பதிலுக்கும் 1 புள்ளி கொடுங்கள். சரியாக கூறும் வரை கேட்கவும். எத்தனை முறை என்று எண்ணுங்கள்
		கவனத்திற்கு மற்றும் கணக்கீடு
5	()	'உலகம்' வலமிருந்து இடமாக வாசிக்கவும். சரியாக கூறிய எழுத்துகளே மதிப்பெண்.
		நினைவு கூர்தல்
3	()	மேலே கூறிய 3 பொருட்களை கேளுங்கள். ஒவ்வொரு சரியான பதிலுக்கும் 1 புள்ளி கொடுங்கள். [குறிப்பு 3 பொருட்களை பதிவின் போது கூறவில்லை என்றால் :. நினைவுகூர்வதைச் சோதிக்க இயலாது]
		மொழி
2	()	பெயர் ஒரு 'பென்சில்' மற்றும் 'வாட்ச்' (2 புள்ளிகள்)
1	()	"இல்லை, இருந்தால்,மேலும், ஆனால்" ஆகியவற்றைத் திரும்பச் சொல்லவும்(1 புள்ளி)
3	()	3 கட்ட கட்டளையைப் பின்பற்றவும்: 'உங்கள் வலது கையில் ஒரு காகிதத்தை எடுத்து

பாதியாக அதை மடித்து,

தரையில் வைக்கவும் (3 புள்ளிகள்)

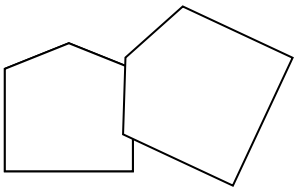
பின்வருவனவற்றைப் படித்து

பின்பற்றவும்:

1 () உங்கள் கண்களை மூடவும்(1 புள்ளி)

1 () ஒரு வாக்கியத்தை எழுதவும் (1 புள்ளி)

1 () கீழ்கண்ட வடிவத்தை வரையவும் (1 புள்ளி)

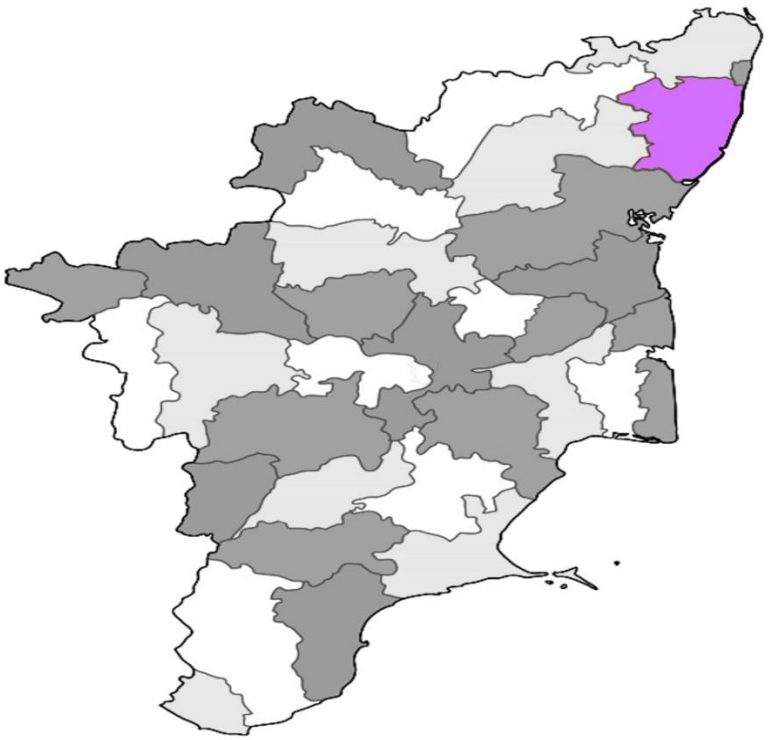


மதிப்பெண் வரம்புகள்:
24 – 30- இயல்பானவர்
18 – 23- லேசான டிமென்ஷியா
10 - 17 -இயல்பான டிமென்ஷியா
<10 கடுமையான டிமென்ஷியா

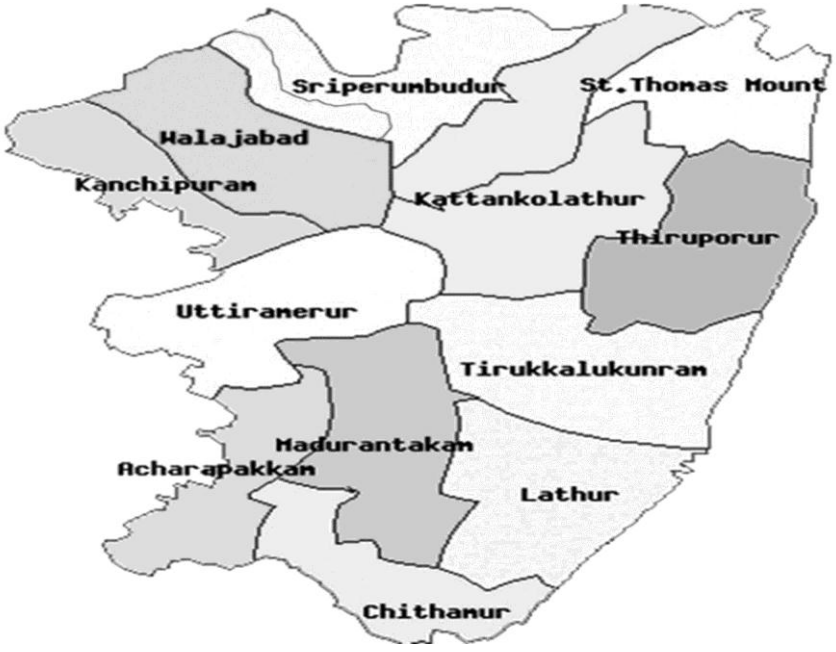
மொத்த மதிப்பெண்_____

ANNEXURE 4

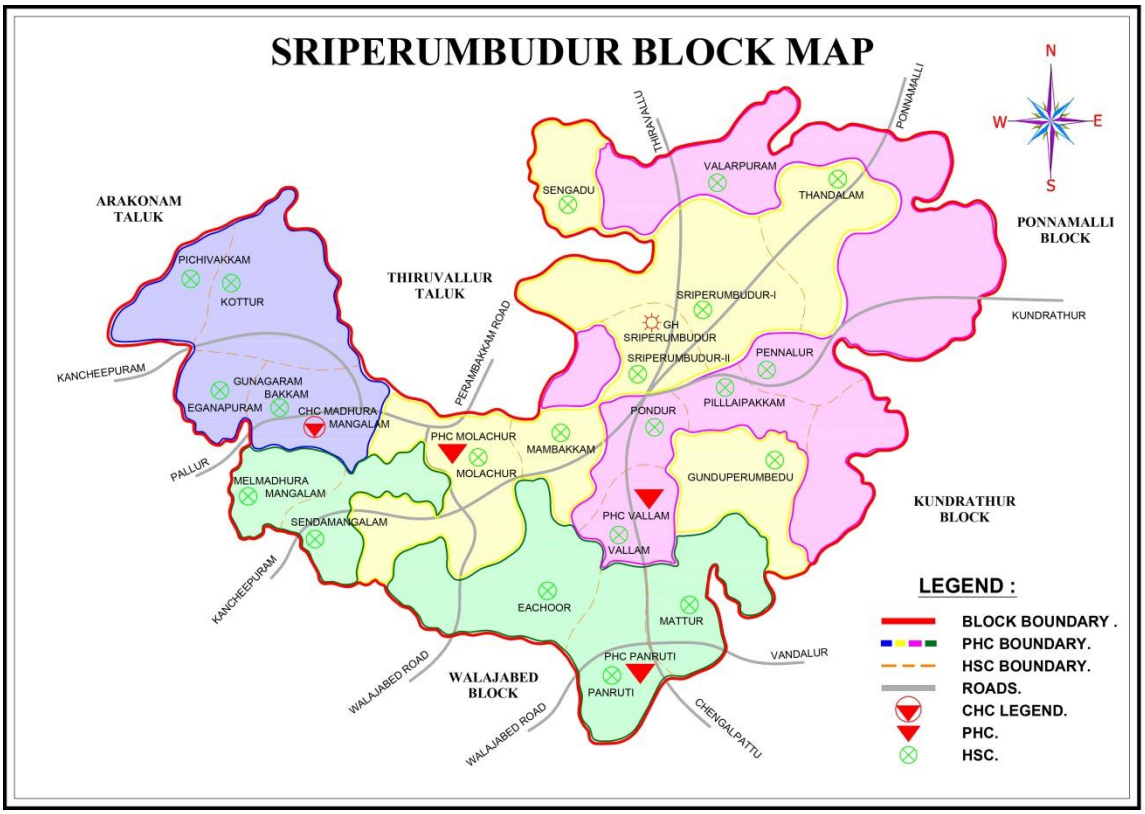
STUDY AREA MAP



TAMILNADU MAP



KANCHIPURAM DISTRICT


SRIPERUMBUDUR BLOCK MAP
N
W
E
S
ARAKONAM TALUK
THIRUVALLUR TALUK
PONNAMALLI BLOCK
KUNDRATHUR BLOCK
WALAJABED BLOCK
PICHIVAKKAM
KOTTUR
KANCHEEPURAM
GUNAGARAM
BAKKAM
EGANAPURAM
CHC MADHURA MANGALAM
PALLUR
MELMADHURA MANGALAM
SENDAMANGALAM
KANCHEEPURAM
WALAJABED ROAD
WALAJABED ROAD
PERAMBAKKAM ROAD
PHC MOLACHUR
MOLACHUR
MAMBAKKAM
SENGADU
VALARPURAM
THANDALAM
THIRAVALLU
PONNAMALLI
SRIPERUMBUDUR-I
GH SRIPERUMBUDUR
SRIPERUMBUDUR-II
PENNALUR
KUNDRATHUR
PILLLAIPAKKAM
PONDUR
GUNDUPERUMBEDU
PHC VALLAM
VALLAM
EACHOOR
MATTUR
VANDALUR
PHC PANRUTI
PANRUTI
CHENGALPATTU
LEGEND :
BLOCK BOUNDARY .
PHC BOUNDARY.
HSC BOUNDARY.
ROADS.
CHC LEGEND.
PHC.
HSC.

ANNEXURE – 5

CLASSIFICATION OF BMI ACCORDING TO WHO GUIDELINES

CATEGORY	BMI RANGE
UNDERWEIGHT	<18.5
NORMAL	18.5 - 24.99
OVERWEIGHT	25.00 – 29.99
OBESE	>=30.00

ANNEXURE – 6

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.M.Malai Ammal
First Year Post Graduate in MD Community Medicine
Institute of Community Medicine
MMC/Chennai

Dear Dr.M.Malai Ammal,

The Institutional Ethics Committee has considered your request and approved your study titled **"PREVALENCE OF FRAILTY AND ITS ASSOCIATED RISK FACTORS AMONG ELDERLY PEOPLE IN TAMIL NADU 2018 – A CROSS SECTIONAL STUDY " - NO.30122017**

The following members of Ethics Committee were present in the meeting hold on **05.12.2017** conducted at Madras Medical College, Chennai 3

1. Prof.P.V.Jayashankar :Chairperson
2. Prof.R.Narayana Babu,MD.,DCH., Dean,MMC,Ch-3 : Deputy Chairperson
3. Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3 : Member Secretary
4. Prof.N.Gopalakrishnan,MD,Director,Inst.of Nephrology,MMC,Ch : Member
5. Prof.S.Mayilvahanan,MD,Director,Inst. of Int.Med,MMC, Ch-3 : Member
6. Prof.Rema Chandramohan,Prof.of Paediatrics,ICH,Chennai : Member
7. Prof. Susila, Director, Inst. of Pharmacology,MMC,Ch-3 : Member
8. Prof.K.Ramadevi,MD., Director, Inst. of Bio-Chemistry,MMC,Ch-3 : Member
9. Thiru S.Govindasamy, BA.,BL,High Court,Chennai : Lawyer
10. Tmt.Arnold Saulina, MA.,MSW., :Social Scientist
11. Thiru K.Ranjith, Ch- 91 : Lay Person

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary - Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

ANNEXURE – 7

URKUND

Urkund Analysis Result

Analysed Document:	Prevalence of frailty and its associated risk factors among elderly people in Tamil Nadu, 2018 - A cross sectional study.docx (D56831842)
Submitted:	10/11/2019 7:55:00 AM
Submitted By:	malaisiva08@gmail.com
Significance:	1 %

Sources included in the report:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6287383/
https://link.springer.com/article/10.1007/s00394-019-01978-7
https://www.mdpi.com/1660-4601/16/18/3457/htm
https://bmjopen.bmj.com/content/9/7/e025941
https://www.researchgate.net/publication/225085601_Mini-Mental_State_Examination_performance_in_frail_pre-frail_and_non-frail_community_dwelling_older_adults_in_Ermelino_Matarazzo_So_Paulo_Brazil

Instances where selected sources appear:

5

CERTIFICATE

This is to certify that this dissertation work titled **"PREVALENCE OF FRAILTY AND ITS ASSOCIATED RISK FACTORS AMONG ELDERLY PEOPLE IN PANRUTI PHC AREA, TAMILNADU 2018 – A CROSS SECTIONAL STUDY"** of the candidate **DR. MALAI AMMAL .M** with registration number **201725002** for the award of **M.D. Degree** in the **BRANCH XV - COMMUNITY MEDICINE**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows **1 Percentage** of plagiarism in the dissertation.

Guide and Supervisor sign with seal

ANNEXURE – 8

KEY TO MASTER CHART

LABEL	CODING
Age group	1 = 80 years 2 = 70 – 79 years 3 = 60 – 69 years
Gender	1 = Female 2 = Male
Educational status	0 = Illiterate 1 = Primary Education 2 = Middle Education 3 = High School Education 4 = Higher Secondary Education 5 = Graduate
Religion	1 = Hindu 2 = Christian 3 = Muslim
Marital status	1 = Never Married 2 = Married 3 = Widowed/Separated
Economic source	1 = Working/Pension 2 = Spouse working/pension 3 = OAP 4 = Children 5 = No income 6 = Property
Lifedescription	1 = very happy 2 = happy

	3 = unhappy 4 = very unhappy
Loss of family members	1 = yes 2 = no
Tiredness	1 = yes 2 = no
Sleep	1 = reduced 2 = normal
Physical/Mental abuse	1 = yes 2 = no
Tobacco use	1 = current user 2 = previous user 3 = never used
Alcohol use	1 = yes 2 = no
Hypertension/Diabetes	0 = no 1 = yes 3 = Don't know
Comorbidity	1 = atleast 1 comorbidity present 2 = no comorbidities
Under treatment	1 = no 2 = yes 3 = Not applicable
Accompanied by	1 = none 2 = spouse/children 3 = Not applicable
Polypharmacy	1 = yes 2 = no

MNA status	1 = Normal 2 = At risk 3 = Malnourished
GDS status	0 = normal 1 = depressed
MMSE status	1 = moderate dementia 2 = mild dementia 3 = normal
BMI	0 = underweight 1 = normal 2 = overweight 3 = obese
Vision	1 = normal 2 = reduced
Grip strength	1 = normal 2 = reduced
Gait speed	1 = reduced 2 = normal
Education group	1 = illiterate 2 = below X standard 3 = above X standard
Frail criteria	1 = frail 2 = prefrail 3 = nonfrail

ANNEXURE 9 - MASTER CHART

S. no	Age	Age group	Gender	Education	Edu grp	Religion	Marital status	No of children	Male	Female	Living with	Source of income	Children visit	Financial help	Life description	loss of family members	tiredness	Night hours	Sleep	physical abuse	mental abuse	Tobacco	Alcohol use	HTN	DM	Others	Comorbidities	under treatment
1	85	3	2	0	1	1	3	2	1	1	2	1	1	0	2	2	1	7	2	2	2	3	2	0	0	2	2	3
2	65	1	2	0	1	1	3	0	0	0	5	3	0	0	3	2	1	4	1	2	2	3	2	1	2	2	1	2
3	68	1	2	0	1	1	3	4	2	2	3	4	2	1	2	2	1	5	1	2	2	3	2	1	1	1	1	1
4	60	1	2	0	1	1	3	6	5	1	2	1	1	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
5	67	1	2	0	1	1	3	4	2	2	2	3	3	0	2	2	1	4	1	2	2	2	2	1	2	2	1	1
6	70	2	2	3	2	1	3	3	3	0	4	1	1	0	3	2	2	7	2	2	2	3	2	1	2	1	1	1
7	62	1	1	3	2	1	2	2	1	1	2	1	2	0	1	2	2	5	1	2	2	3	2	1	1	2	1	1
8	68	1	1	2	2	1	2	5	3	2	2	1	2	0	2	2	2	7	2	2	2	3	2	2	1	2	1	1
9	60	1	2	1	1	1	3	3	2	1	2	3	2	0	2	2	2	4	1	2	2	3	2	0	1	2	1	1
10	60	1	1	0	1	1	2	3	2	1	1	1	2	0	2	2	2	8	2	2	2	1	1	0	0	2	2	3
11	64	1	2	0	1	1	3	5	3	2	1	2	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
12	65	1	2	1	1	1	2	1	1	0	1	1	2	0	4	2	1	4	1	2	2	3	2	1	1	1	1	1
13	68	1	2	0	1	2	3	3	2	1	2	1	2	0	4	1	1	5	1	2	2	3	2	0	0	2	2	3
14	60	1	2	2	2	1	2	2	1	1	1	2	4	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
15	60	1	2	0	1	1	2	2	1	1	1	2	2	0	2	2	2	8	2	2	2	3	2	1	0	2	1	1
16	60	1	2	0	1	1	3	5	2	3	2	3	3	0	2	2	1	5	1	2	2	3	2	0	0	2	2	3
17	60	1	1	0	1	1	3	3	0	3	4	1	3	0	3	2	1	5	1	2	2	1	1	0	0	2	2	3
18	82	3	1	0	1	1	2	3	1	2	2	3	4	0	3	2	1	5	1	2	2	3	2	1	1	2	1	1
19	63	1	2	4	2	2	2	4	3	1	2	1	4	0	2	2	2	8	2	2	2	3	2	1	2	1	1	1
20	67	1	2	0	1	1	1	0	0	0	4	3	0	0	4	2	1	4	1	2	2	3	2	0	0	2	2	3
21	60	1	2	0	1	1	2	3	2	1	2	4	3	0	1	2	2	8	2	2	2	3	2	2	2	1	1	1
22	62	1	1	2	2	1	2	4	1	3	1	1	2	0	2	2	2	8	2	2	2	1	1	2	2	2	2	3
23	60	1	1	0	1	1	2	4	2	2	2	1	2	0	2	2	2	5	1	2	2	1	1	2	2	1	1	1
24	62	1	1	1	1	1	2	2	1	1	2	1	3	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
25	83	3	1	2	2	1	3	2	2	0	4	1	1	0	4	2	1	4	1	2	2	1	2	1	2	2	1	1
26	76	2	2	0	1	1	3	6	4	2	4	3	0	0	2	2	2	8	2	2	2	1	2	1	0	2	1	1
27	60	1	2	0	1	1	3	1	1	0	2	4	4	0	3	2	1	4	1	2	2	3	2	0	0	2	2	3
28	75	2	2	0	1	1	3	4	0	4	4	3	1	0	3	2	1	5	1	2	2	1	2	1	2	2	1	1
29	60	1	1	0	1	1	2	2	1	1	2	1	1	0	2	2	2	8	2	2	2	1	2	0	0	2	2	3
30	60	1	2	2	2	1	2	3	3	0	1	2	4	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
31	60	1	2	0	1	2	2	6	4	2	2	5	1	0	2	2	1	8	2	2	2	1	2	1	1	2	1	1
32	92	3	1	1	1	1	3	5	1	4	2	3	1	0	3	2	1	5	1	2	2	2	2	2	2	2	2	3
33	70	2	2	0	1	2	3	3	2	1	2	3	1	0	2	2	1	8	2	2	2	3	2	2	1	2	1	1
34	65	1	2	0	1	2	3	3	2	1	4	4	2	2	4	2	1	5	1	2	2	3	2	2	2	1	1	1
35	61	1	1	2	2	1	3	4	3	1	2	3	1	0	2	2	1	8	2	2	2	3	2	1	2	2	1	1
36	80	2	1	0	1	1	3	6	4	2	2	3	1	0	4	1	1	4	1	2	2	3	2	2	2	2	2	3
37	80	2	1	0	1	1	2	2	1	1	2	3	1	0	2	2	1	5	1	2	2	2	2	0	0	2	2	3
38	60	1	1	0	1	1	2	4	3	1	2	5	1	0	3	2	1	4	1	2	1	3	2	1	2	2	1	1
39	65	1	2	0	1	2	2	2	1	1	2	5	1	0	2	2	1	8	2	2	2	3	2	2	2	2	2	3
40	60	1	2	0	1	1	3	2	2	0	2	3	1	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
41	60	1	2	2	2	1	3	4	2	2	3	5	1	0	3	2	1	5	1	2	2	3	2	1	1	1	1	1
42	70	2	2	0	1	1	3	3	1	2	2	3	1	0	3	2	1	5	1	2	2	3	2	1	2	2	1	3
43	76	2	1	5	2	1	2	1	1	0	1	1	2	0	2	2	2	8	2	2	2	3	2	1	2	1	1	1
44	76	2	1	5	2	2	3	6	3	3	2	1	1	0	2	2	2	8	2	2	2	3	1	2	1	2	1	1
45	60	1	2	0	1	1	3	2	1	1	2	3	2	0	2	2	2	8	2	2	2	3	2	1	1	2	1	2
46	65	1	2	0	1	1	3	6	3	3	4	4	1	3	3	2	1	4	1	2	2	3	2	1	1	2	1	1
47	76	2	1	1	1	1	2	7	4	3	1	3	1	0	4	2	1	5	1	2	2	1	1	2	2	2	2	3
48	68	1	1	0	1	1	3	5	4	1	3	3	1	0	2	2	2	5	1	2	2	1	1	1	2	2	1	1
49	77	2	1	2	2	1	2	2	1	1	1	6	1	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1
50	60	1	2	0	1	1	4	6	4	2	2	5	1	0	4	2	1	4	1	2	2	1	2	1	1	1	1	1
51	67	1	1	1	1	1	2	6	1	5	1	1	3	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
52	70	2	2	0	1	1	3	6	4	2	4	3	1	0	3	2	1	4	1	2	2	3	2	1	2	1	1	1
53	77	2	1	5	2	1	3	4	2	2	2	1	2	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1
54	68	1	1	0	1	1	2	5	2	3	1	4	3	2	2	2	1	5	1	2	2	3	2	1	1	2	1	1
55	76	2	1	5	2	1	3	0	0	0	5	1	0	0	3	2	1	4	1	2	2	3	2	1	1	1	1	1
56	80	3	1	0	1	1	2	5	1	4	2	4	2	2	1	2	2	8	2	2	2	3	2	2	2	2	2	3
57	60	1	2	0	1	1	3	0	0	0	4	3	0	0	3	2	2	4	1	2	2	3	2	2	2	2	2	3

S. no	Age	Age group	Gender	Education	Edu grp	Religion	Marital status	No of children	Male	Female	Living with	Source of income	Children visit	Financial help	Life description	loss of family members	tiredness	Night hours	Sleep	physical abuse	mental abuse	Tobacco	Alcohol use	HTN	DM	Others	Comorbidities	under treatment
58	60	1	1	4	2	1	2	2	1	1	1	1	4	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
59	63	1	2	0	1	1	2	4	1	3	1	2	2	0	4	2	1	4	1	2	1	3	2	2	1	2	1	1
60	61	1	2	1	1	1	2	1	1	0	1	1	2	0	4	1	1	5	1	2	2	3	2	2	1	1	1	1
61	60	1	1	2	2	1	2	2	2	0	1	3	2	0	2	2	2	8	2	2	2	3	2	1	1	1	1	1
62	60	1	2	0	1	1	3	3	2	1	2	4	2	2	3	2	1	5	1	2	2	3	2	2	2	2	2	3
63	65	1	2	0	1	1	3	2	2	0	4	3	2	1	2	2	2	5	1	2	2	3	2	1	2	2	1	1
64	60	1	1	0	1	1	2	2	2	0	2	1	3	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
65	60	1	1	4	2	1	2	3	1	2	1	1	2	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
66	66	1	1	0	1	1	3	3	1	2	3	1	1	0	3	2	1	5	1	2	2	1	1	1	2	2	1	1
67	72	2	2	0	1	1	3	5	3	2	2	4	2	2	2	2	2	8	2	2	2	3	2	2	2	2	2	3
68	72	2	1	1	1	1	3	6	2	4	2	1	2	0	2	2	2	5	1	2	2	3	2	2	2	2	2	3
69	71	2	2	0	1	1	3	2	1	1	3	4	3	2	3	2	1	4	1	2	2	3	2	2	2	2	2	3
70	64	1	2	1	1	1	3	4	0	4	3	1	3	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
71	70	2	2	0	1	1	3	1	1	0	2	4	4	0	2	2	1	5	1	2	2	3	2	2	2	2	2	3
72	70	2	2	0	1	1	2	2	2	0	2	4	2	2	3	2	1	4	1	2	2	3	2	1	1	2	1	1
73	60	1	1	1	1	1	3	3	1	2	2	4	3	2	2	2	2	8	2	2	2	1	2	1	1	1	1	1
74	61	1	1	2	2	1	2	3	1	2	1	1	2	0	2	2	1	8	2	2	2	2	1	0	0	2	2	3
75	61	1	2	1	1	2	3	0	0	0	4	6	0	0	1	2	2	8	2	2	2	3	2	2	1	2	1	1
76	60	1	2	3	2	2	2	2	1	1	1	2	4	0	3	2	1	5	1	2	2	3	2	1	1	1	1	1
77	60	1	1	1	1	1	2	4	2	2	1	1	3	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
78	60	1	2	0	1	3	2	3	2	1	1	2	2	0	2	2	1	8	2	2	2	3	2	2	1	2	1	1
79	61	1	1	0	1	1	3	4	2	2	2	1	2	0	4	2	1	4	1	2	2	3	2	2	1	2	1	1
80	60	1	2	0	1	1	3	3	2	1	2	4	3	2	2	2	2	8	2	2	2	3	2	1	1	2	1	1
81	60	1	2	0	1	1	2	3	3	0	4	1	2	0	3	2	2	5	1	2	2	3	2	0	0	2	2	3
82	60	1	2	0	1	3	2	3	2	1	1	2	3	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1
83	60	1	1	3	2	1	2	3	0	3	1	1	4	0	2	2	2	8	2	2	2	1	1	1	2	2	1	1
84	60	1	2	0	1	1	3	0	0	0	4	6	0	0	4	1	1	5	1	2	2	3	2	1	1	2	1	1
85	61	1	1	0	1	1	2	2	2	0	1	1	2	0	2	2	2	8	2	2	2	1	2	0	0	2	2	3
86	62	1	2	0	1	1	3	2	2	0	2	1	2	0	4	2	1	5	1	2	2	3	2	0	0	2	2	3
87	71	2	1	1	1	1	2	7	5	2	1	4	3	2	2	2	2	6	2	2	2	2	2	1	2	2	1	1
88	65	1	1	0	1	1	2	5	4	1	1	1	2	0	2	2	2	8	2	2	2	3	1	0	0	2	2	3
89	66	1	2	0	1	1	3	5	2	3	2	3	2	0	2	2	2	7	2	2	2	2	2	1	2	2	1	1
90	71	2	1	0	1	1	2	3	3	0	1	3	2	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
91	62	1	2	4	2	1	2	2	1	1	1	1	4	0	2	2	2	8	2	2	2	3	2	0	0	2	2	3
92	62	1	2	0	1	1	3	0	0	0	4	3	0	0	4	2	1	5	1	2	2	3	2	0	0	2	2	3
93	60	1	2	0	1	1	2	2	1	1	1	2	3	0	4	2	1	5	1	2	2	3	2	0	0	2	2	3
94	60	1	2	0	1	1	2	2	2	0	1	1	2	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
95	65	1	2	0	1	1	3	4	2	2	2	1	2	0	3	2	1	5	1	2	2	3	2	1	2	2	1	1
96	75	2	2	0	1	1	3	6	4	2	2	5	2	0	3	2	1	5	1	2	2	2	2	0	0	2	2	3
97	60	1	2	0	1	1	2	1	0	1	3	2	4	0	1	2	2	8	2	2	2	3	2	2	1	1	1	1
98	60	1	2	0	1	1	2	3	2	1	1	2	2	0	2	2	2	8	2	2	2	1	2	0	0	2	2	3
99	72	2	2	0	1	1	3	8	4	4	4	3	2	0	3	2	1	4	1	2	2	1	2	2	2	2	2	3
100	60	1	1	3	2	2	3	5	3	2	2	1	3	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1
101	75	2	2	0	1	1	3	1	1	0	4	1	2	0	4	2	1	5	1	2	2	3	2	1	2	2	1	1
102	69	1	1	3	2	1	2	1	1	0	4	1	2	0	3	2	2	4	1	2	2	1	1	2	2	2	2	3
103	60	1	2	3	2	1	2	4	3	1	1	1	2	0	2	2	2	8	2	2	2	3	2	0	0	2	2	3
104	60	1	2	2	2	1	2	2	1	1	1	1	3	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
105	68	1	2	0	1	1	2	3	3	0	2	1	2	0	2	2	2	8	2	2	2	3	2	2	2	1	1	2
106	65	1	2	0	1	1	2	0	0	0	4	3	0	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
107	65	1	2	0	1	1	2	2	1	1	1	1	2	0	2	2	2	8	2	2	2	3	2	0	0	2	2	3
108	80	3	2	0	1	1	2	5	3	2	1	1	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
109	60	1	2	0	1	1	3	3	2	1	2	1	3	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
110	60	1	2	0	1	1	3	4	3	1	2	1	2	0	3	2	1	5	1	2	2	1	2	1	1	2	1	1
111	65	1	2	0	1	1	2	6	3	3	2	1	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
112	60	1	2	0	1	1	3	4	2	2	4	2	3	0	3	2	1	7	2	2	2	3	2	2	1	2	1	1
113	61	1	1	1	1	1	2	2	1	1	2	1	3	0	2	2	2	8	2	2	2	1	2	2	2	2	2	1
114	64	1	2	1	1	1	2	3	2	1	1	2	3	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
115	60	1	2	1	1	1	2	3	2	1	1	1	2	0	2	2	2	6	2	2	2	3	2	1	2	2	1	1

S. no	Age	Age group	Gender	Education	Edu grp	Religion	Marital status	No of children	Male	Female	Living with	Source of income	Children visit	Financial help	Life description	loss of family members	tired ness	Night hours	Sleep	physical abuse	mental abuse	Tobacco	Alcohol use	HTN	DM	Others	Comorbidities	under treatment
116	65	1	2	0	1	1	3	6	5	1	2	1	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
117	70	2	2	0	1	1	3	5	0	5	3	1	2	0	3	2	1	5	1	2	2	3	2	1	1	1	1	1
118	70	2	2	0	1	1	3	2	2	0	2	1	2	0	3	2	1	4	1	2	2	3	2	0	0	2	2	3
119	60	1	2	0	1	1	2	4	2	2	1	1	2	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
120	80	3	2	0	1	1	3	1	1	0	2	3	4	0	4	2	1	4	1	2	2	3	2	1	1	2	1	1
121	60	1	2	0	1	1	2	3	3	0	1	2	2	0	2	2	2	8	2	2	2	3	2	0	0	2	2	3
122	60	1	2	0	1	1	3	3	1	2	2	3	3	0	2	2	2	8	2	2	2	1	2	0	0	2	2	3
123	62	1	2	2	2	1	2	2	1	1	1	6	3	0	2	2	2	8	2	2	2	3	2	1	0	2	1	1
124	80	3	1	2	2	1	3	3	0	3	3	3	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
125	75	2	2	0	1	1	3	4	3	1	2	4	2	0	3	2	1	4	1	2	2	3	2	0	0	2	2	3
126	60	1	2	0	1	1	2	3	2	1	2	2	3	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
127	60	1	2	0	1	3	1	1	1	0	2	1	4	0	3	2	1	4	1	2	2	3	2	2	1	2	1	1
128	86	3	2	0	1	1	3	3	2	1	2	4	3	2	4	2	1	4	1	2	2	3	2	1	1	2	1	1
129	67	1	2	0	1	1	2	4	3	1	1	2	1	0	4	2	1	5	1	2	2	3	2	1	1	2	1	1
130	60	1	2	0	1	1	2	3	0	3	1	2	2	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
131	60	1	1	0	1	1	2	8	5	3	1	1	2	0	2	2	2	7	2	2	2	3	2	2	1	2	1	1
132	80	3	2	0	1	1	3	7	2	5	2	3	2	0	4	1	1	4	1	2	2	3	2	0	0	2	2	3
133	72	2	2	0	1	1	3	2	1	1	4	3	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
134	60	1	2	2	2	1	3	1	0	1	3	1	4	0	3	2	1	5	1	2	2	3	2	2	1	2	1	1
135	61	1	2	0	1	1	3	7	4	3	2	3	2	0	4	2	1	4	1	2	2	3	2	2	2	1	1	2
136	60	1	2	0	1	1	2	3	2	1	2	2	2	0	2	2	2	6	2	2	2	3	2	1	1	2	1	1
137	72	2	2	0	1	1	3	3	0	3	3	3	1	0	3	2	1	5	1	2	2	3	2	2	1	2	1	1
138	67	1	2	0	1	1	3	2	1	1	2	3	2	0	4	2	1	5	1	2	2	3	2	1	1	2	1	1
139	60	1	2	0	1	2	2	2	1	1	1	2	3	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
140	60	1	2	0	1	1	3	4	1	3	4	1	2	0	3	2	1	5	1	2	2	3	2	1	1	2	1	1
141	60	1	2	0	1	1	2	2	0	2	3	5	2	0	4	2	1	4	1	2	2	3	2	2	1	2	1	1
142	80	3	2	0	1	1	3	3	1	2	3	3	2	0	4	2	1	4	1	2	2	3	2	0	0	2	2	3
143	60	1	2	0	1	1	2	4	2	2	1	2	2	0	2	2	2	8	2	2	2	3	2	2	1	2	1	1
144	65	1	1	0	1	1	3	1	1	0	2	4	4	0	2	2	2	7	2	2	2	3	2	1	1	2	1	1
145	60	1	1	3	2	2	2	2	2	0	1	1	2	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
146	69	1	2	0	1	3	3	4	3	1	2	3	3	0	2	2	2	7	2	2	2	3	2	2	1	2	1	1
147	84	3	2	1	1	1	3	2	1	1	4	2	3	2	4	2	1	5	1	2	2	3	2	2	2	1	2	3
148	64	1	1	5	2	1	2	1	1	0	1	1	1	0	1	2	2	8	2	2	2	3	1	1	0	2	1	1
149	62	1	2	3	2	1	2	1	1	0	1	1	1	0	1	2	2	8	2	2	2	3	2	1	0	2	1	1
150	60	1	2	3	2	1	2	1	0	1	3	4	4	2	2	2	1	5	1	2	2	3	2	1	0	2	1	1
151	62	1	1	3	2	1	2	1	0	1	3	4	4	2	2	2	2	8	2	2	2	3	2	1	0	2	1	1
152	82	3	2	2	2	1	3	5	4	1	4	4	1	2	4	2	1	4	1	2	2	1	2	2	1	2	1	1
153	61	1	2	4	2	1	3	1	1	0	2	2	4	0	4	1	1	4	1	2	2	3	2	2	2	1	2	3
154	71	2	1	5	2	1	2	1	1	0	2	1	4	0	1	2	2	8	2	2	2	3	2	1	0	2	1	1
155	67	1	2	3	2	1	2	1	1	0	2	2	4	0	2	2	1	7	2	2	2	3	2	2	2	1	2	1
156	65	1	2	0	1	1	2	0	0	0	4	3	0	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
157	65	1	2	0	1	1	2	2	1	1	1	1	2	0	2	2	2	8	2	2	2	3	2	0	0	2	2	3
158	80	3	2	0	1	1	2	5	3	2	1	1	2	0	3	2	1	5	1	2	2	3	2	0	0	2	2	3
159	60	1	2	0	1	1	3	3	2	1	2	1	3	0	2	2	2	8	2	2	2	3	2	2	2	2	2	3
160	76	2	1	1	1	1	2	7	4	3	1	3	1	0	4	2	1	5	1	2	2	1	1	2	2	2	2	3
161	68	1	1	0	1	1	3	5	4	1	3	3	1	0	2	2	2	5	1	2	2	1	1	1	2	2	1	1
162	77	2	1	2	2	1	2	2	1	1	1	6	1	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1
163	60	1	2	0	1	1	4	6	4	2	2	5	1	0	4	2	1	4	1	2	2	1	2	1	1	1	1	1
164	67	1	1	1	1	1	2	6	1	5	1	1	3	0	2	2	2	8	2	2	2	3	2	1	1	2	1	1
165	70	2	2	0	1	1	3	6	4	2	4	3	1	0	3	2	1	4	1	2	2	3	2	1	2	1	1	1
166	77	2	1	5	2	1	3	4	2	2	2	1	2	0	2	2	2	8	2	2	2	3	2	1	2	2	1	1

S. no	Age	who will accompany	no of drugs	Polypharmacy	ADL	MNA	MNA status	GDS	GDS status	MMSE	MMSE status	Height (cm)	Weight (cm)	BMI	BMI cat	BP (mm Hg)	Vision	Grip strength	grip category	4m walking test	Speed test	phy activity	Low energy	no of Fried	Frailcat
1	85	3	0	2	6	12	0	3	0	23	3	135	66	36.2	3	128/85	2	15	2	6s	2	1	2	3	1
2	65	3	0	2	6	9	1	11	1	22	2	133	41	23.2	1	113/79	2	13	2	8s	2	1	2	3	1
3	68	1	0	2	6	11	1	3	0	20	2	125	31	19.8	1	106/58	1	23	1	5s	2	1	2	2	2
4	60	1	5	1	6	14	0	2	0	22	2	139	56	29	2	130/80	1	14	2	5s	2	1	1	2	2
5	67	1	4	1	5	14	0	2	0	23	2	135	46	25.2	2	126/85	2	12	2	7s	2	2	2	4	1
6	70	1	8	1	6	14	0	9	1	30	3	129	45	27	2	120/80	1	12	2	5s	2	1	1	2	2
7	62	1	6	1	6	14	0	1	0	30	3	152	64	27.7	2	120/80	2	15	2	5s	2	1	1	2	2
8	68	1	3	2	6	14	0	2	0	28	3	143	56	27.4	2	100/70	2	34	1	5s	2	1	1	1	2
9	60	1	4	1	6	14	0	2	0	23	2	131	58	33.8	3	110/70	2	20	1	6s	2	1	1	1	2
10	60	3	0	2	6	13	0	1	0	23	2	152	53	22.9	0	100/70	2	32	1	5s	2	1	1	1	2
11	64	3	0	2	6	13	0	10	1	22	2	128	55	33.6	3	120/80	1	21	1	4s	1	1	2	1	2
12	65	1	7	2	6	14	0	13	1	20	2	134	65	36.2	3	110/70	2	12	2	6s	2	1	2	3	1
13	68	3	0	2	6	10	1	13	1	21	2	142	41	20.3	0	140/90	2	11	2	8s	2	1	2	3	1
14	60	3	0	2	6	14	0	1	0	24	3	134	47	26.2	2	110/70	1	24	1	4s	1	1	1	0	3
15	60	1	3	2	6	14	0	2	0	22	2	135	61	33.5	3	160/100	2	22	1	6s	2	1	1	1	2
16	60	3	0	2	6	14	0	1	0	22	2	136	45	24.3	1	130/90	2	23	1	5s	2	1	2	2	2
17	60	3	0	2	6	13	0	10	1	23	2	152	47	20.3	1	130/90	2	32	1	5s	2	1	2	2	2
18	82	1	6	1	6	7	2	10	1	19	2	144	47	22.7	1	181/98	2	15	2	6s	2	1	2	3	1
19	63	1	6	1	6	9	1	2	0	24	3	151	49	21.5	1	127/80	1	19	1	6s	2	1	1	1	2
20	67	3	0	2	6	14	0	1	0	20	2	152	55	23.8	1	100/70	2	22	1	7s	2	1	2	2	2
21	60	1	3	2	6	14	0	2	0	24	3	146	61	28.6	2	133/83	1	30	1	5s	2	1	1	1	2
22	62	3	0	2	6	5	2	3	0	25	3	159	42	16.6	0	134/88	1	33	1	5s	2	1	1	2	2
23	60	1	4	1	6	14	0	2	0	25	3	180	80	24.7	1	165/110	1	34	1	6s	2	1	1	1	2
24	62	1	4	1	6	6	2	7	1	23	2	155	43	17.9	0	105/52	2	25	1	6s	2	1	1	2	2
25	83	1	4	1	6	4	2	12	1	17	1	150	40	17.8	0	108/57	2	12	2	6s	2	1	2	4	1
26	76	1	3	2	6	14	0	2	0	25	3	143	59	28.9	2	160/109	2	27	1	6s	2	1	1	1	2
27	60	3	0	2	6	7	2	10	1	11	1	144	56	27	2	108/66	2	22	1	5s	2	1	2	3	1
28	75	1	3	2	6	14	0	8	2	23	2	150	66	29.3	2	130/66	2	13	2	7s	2	1	2	3	1
29	60	3	0	2	6	13	0	2	0	24	3	155	55	22.9	1	155/55	2	25	1	4s	1	1	1	0	3
30	60	3	0	2	6	5	2	3	0	25	3	148	40	18.3	0	96/60	1	25	1	5s	2	1	1	2	2
31	60	1	4	1	6	13	1	2	0	21	2	151	52	22.8	1	161/103	2	23	1	6s	2	1	2	2	2
32	92	3	0	2	6	3	2	13	1	19	1	145	37	17.6	0	157/77	2	5	2	8s	2	1	2	4	1
33	70	1	4	1	6	12	0	2	0	23	2	143	40	19.6	1	132/70	2	6	2	6s	2	1	2	3	1
34	65	1	5	1	6	6	2	14	1	16	1	145	43.6	20.7	1	124/70	2	15	2	6s	2	1	2	4	1
35	61	1	4	1	6	8	1	2	0	18	2	150	40	17.8	0	147/92	2	23	1	5s	2	1	2	2	2
36	80	3	0	2	6	4	2	14	1	19	1	154	41	17.3	0	115/68	2	0	2	4s	1	1	2	3	1
37	80	3	0	2	6	8	1	2	0	23	2	154	43	18.1	0	171/73	2	13	2	4s	1	1	2	2	2
38	60	1	4	1	6	5	2	10	1	22	2	150	47	20.9	1	145/77	2	23	1	4s	1	1	2	2	2
39	65	3	0	2	6	12	0	2	0	24	3	145	46	21.9	1	89/57	1	16	1	5s	2	1	2	2	2
40	60	3	0	2	6	13	0	2	0	24	3	144	45	21.7	1	129/74	2	16	1	7s	2	1	1	1	2
41	60	1	8	1	6	9	1	11	1	23	2	153	66	28.2	2	176/87	2	12	2	11s	2	1	2	3	1
42	70	3	0	2	6	6	2	8	1	22	2	136	35	18.9	1	115/71	2	12	2	5s	2	1	2	4	1
43	76	1	8	1	6	10	1	4	0	22	2	164	65	24.2	1	154/74	2	23	1	8s	2	1	1	1	2
44	76	1	4	1	6	14	0	2	0	25	3	161	69	26.6	2	145/76	2	22	1	5s	2	1	1	1	2
45	60	3	0	2	6	14	0	2	0	24	3	150	70	31.1	3	142/86	2	23	1	5s	2	1	1	1	2
46	65	1	6	1	6	8	1	12	1	21	2	150	61	27.1	2	171/105	2	23	1	8s	2	1	2	2	2
47	76	3	0	2	6	8	1	9	1	23	2	164	60	22.3	1	109/60	2	23	1	9s	2	1	2	2	2
48	68	1	4	1	6	9	1	2	0	24	3	150	36	16	0	119/73	2	12	2	8s	2	1	1	2	2

S. no	Age	who will accompany	no of drugs	Polypharmacy	ADL	MNA	MNA status	GDS	GDS status	MMSE	MMSE status	Height (cm)	Weight (cm)	BMI	BMI cat	BP (mm Hg)	Vision	Grip strength	grip category	4m walking test	Speed test	phy activity	Low energy	no of Fried	Frailcat
49	77	1	4	1	6	14	0	2	0	24	3	164	63	23.4	1	165/93	2	11	2	8s	2	1	1	2	2
50	60	1	8	2	6	6	2	13	1	23	2	147	39	18	1	168/74	2	14	2	8s	2	1	2	3	1
51	67	2	5	1	6	12	0	4	0	23	2	165	70	25.7	2	140/67	2	25	1	8s	2	1	1	1	2
52	70	1	8	1	6	5	2	12	1	21	2	156	47	19.3	1	133/78	2	22	1	7s	2	1	2	3	1
53	77	1	4	1	6	14	0	3	0	25	3	156	57	23.4	1	167/83	2	32	1	7s	2	1	1	1	2
54	68	1	3	2	6	14	0	2	0	24	3	160	69	27	2	143/85	2	23	1	6s	2	1	2	2	2
55	76	1	9	1	6	9	1	10	1	24	3	157	70	28.4	2	171/98	2	22	1	10s	2	1	2	2	2
56	80	3	0	2	6	12	0	2	0	23	2	160	65	25.4	2	110/70	1	12	2	5s	2	1	1	2	2
57	60	3	0	2	6	8	1	7	1	21	2	156	55	22.6	1	100/70	2	17	2	6s	2	1	1	2	2
58	60	1	3	2	6	12	0	4	0	26	3	166	75	27.2	2	160/70	1	14	2	4s	1	1	1	1	2
59	63	1	3	2	6	10	1	9	0	24	3	140	63	32.1	3	120/80	2	16	2	4s	1	1	2	2	2
60	61	1	3	2	6	8	1	11	1	20	2	149	65	29.3	2	110/70	2	17	1	6s	2	1	2	2	2
61	60	1	9	1	6	14	0	2	0	24	3	163	80	30.1	3	120/80	2	36	1	4s	1	1	1	0	3
62	60	3	0	2	6	7	1	7	1	21	2	144	50	24.1	1	110/70	2	12	2	6s	2	1	2	3	1
63	65	1	3	2	6	13	0	4	0	26	3	157	58	23.5	1	140/80	1	20	1	4s	1	1	1	0	3
64	60	3	0	2	6	13	0	3	0	26	3	150	46	20.4	1	110/70	1	23	1	4s	1	1	1	0	3
65	60	1	3	2	6	14	0	3	0	24	3	167	75	26.9	2	140/80	2	50	1	4s	1	1	1	0	3
66	66	1	4	1	6	3	2	8	1	19	2	149	41	18.5	0	150/70	2	20	1	6s	2	1	2	3	1
67	72	3	0	2	6	11	1	2	0	24	3	145	57	27.1	2	90/60	2	30	1	4s	1	1	1	0	1
68	72	3	0	2	6	9	1	4	0	25	3	149	35	15.8	0	100/70	2	13	2	5s	2	1	1	2	2
69	71	3	0	2	6	8	1	8	1	20	2	151	46	20.2	1	110/70	1	32	1	5s	2	1	2	2	2
70	64	1	4	1	6	14	0	3	0	25	3	138	65	34.1	3	120/80	2	18	1	4s	1	1	1	0	3
71	70	3	0	2	6	11	1	2	0	24	3	140	35	17.9	0	110/70	1	25	1	4s	1	1	2	1	2
72	70	1	6	1	6	8	1	6	1	21	2	140	45	23	1	120/80	2	15	2	6s	2	1	2	3	1
73	60	1	8	1	6	14	0	3	0	26	3	154	60	25.3	2	150/80	2	13	2	4s	1	1	1	1	2
74	61	3	0	2	6	12	0	3	0	27	3	164	61	22.7	1	110/70	1	28	1	4s	1	1	2	1	2
75	61	1	3	2	6	9	1	7	1	24	3	154	69	29.1	2	110/70	2	13	2	4s	1	1	1	1	2
76	60	1	6	1	6	9	1	9	1	26	3	149	73	32.9	3	170/80	1	30	1	4s	1	1	2	1	2
77	60	1	3	2	6	13	0	2	0	25	3	156	55	22.6	1	140/90	1	31	1	4s	1	1	1	0	3
78	60	1	3	2	6	12	0	2	0	21	2	158	50	20	1	120/70	2	20	1	5s	2	1	2	2	2
79	61	1	4	1	6	6	2	7	1	23	2	163	61	23	1	130/90	2	17	2	5s	2	1	2	4	1
80	60	1	5	1	6	14	0	3	0	24	3	152	91	39.4	3	140/90	2	16	1	4s	1	1	1	0	3
81	60	3	0	2	6	5	2	12	1	21	2	145	43	20.5	1	110/70	2	14	2	5s	2	1	1	3	1
82	60	2	3	2	6	14	0	3	0	25	3	148	79	36.1	3	150/100	1	17	1	4s	1	1	1	0	3
83	60	1	2	2	6	13	0	2	0	24	3	167	60	21.5	1	150/90	1	27	1	4s	1	1	1	0	3
84	60	1	6	1	6	6	2	10	1	16	1	143	52	26.9	2	120/70	1	13	2	6s	2	1	2	4	1
85	61	3	0	2	6	14	0	2	0	24	3	160	64	25	2	130/80	2	18	2	5s	2	1	1	2	2
86	62	3	0	2	6	6	2	12	1	21	2	143	45	22	1	120/80	2	16	1	6s	2	1	2	3	1
87	71	1	2	2	6	14	0	3	0	24	3	168	72	25.5	2	140/80	1	17	2	4s	1	1	1	1	2
88	65	3	0	2	6	12	0	3	0	24	3	170	58	20.1	1	120/70	2	13	2	5s	2	1	1	2	2
89	66	1	3	2	6	14	0	2	0	24	3	149	55	24.8	1	130/60	2	14	2	5s	2	1	1	2	2
90	71	3	0	2	6	11	1	2	0	24	3	142	38	18.8	1	130/80	2	14	2	4s	1	1	1	1	2
91	62	3	0	2	6	12	0	2	0	27	3	155	50	20.8	1	100/60	1	21	1	4s	1	1	1	0	3
92	62	3	0	2	6	8	1	12	1	22	2	150	50	22.2	1	100/70	2	25	1	6s	2	1	2	2	2
93	60	3	0	2	6	7	2	8	1	21	2	152	48	20.8	1	130/70	2	13	2	6s	2	1	2	4	1
94	60	1	3	2	6	14	0	3	0	19	2	145	64	30.4	3	130/80	2	16	1	7s	2	1	1	2	2
95	65	1	2	2	6	11	1	7	1	24	3	143	69	33.7	3	120/70	1	14	2	5s	2	1	2	3	1
96	75	3	0	2	6	7	2	9	1	23	2	150	43	19.1	1	160/70	2	21	1	6s	2	1	2	3	1

S. no	Age	who will accompany	no of drugs	Polypharmacy	ADL	MNA	MNA status	GDS	GDS status	MMSE	MMSE status	Height (cm)	Weight (cm)	BMI	BMI cat	BP (mm Hg)	Vision	Grip strength	grip category	4m walking test	Speed test	phy activity	Low energy	no of Fried	Frailcat
97	60	2	6	1	6	14	0	2	0	24	3	154	83	35	3	130/80	2	16	1	6s	2	1	1	1	2
98	60	3	0	2	6	13	0	3	0	24	3	153	52	22.2	1	130/70	2	30	1	4s	1	1	1	0	3
99	72	3	0	2	6	7	2	7	1	23	2	152	55	23.8	1	170/80	1	5	2	6s	2	1	2	4	1
100	60	1	3	2	6	11	1	2	0	24	3	167	52	18.6	1	130/85	1	20	1	4s	1	1	1	0	3
101	75	1	3	2	6	4	2	12	1	21	2	148	41	18.7	1	150/70	2	10	2	7s	2	1	2	4	1
102	69	3	0	2	6	6	2	10	1	23	2	148	45	20.5	1	143/75	1	25	2	5s	2	1	1	3	1
103	60	3	0	2	6	14	0	3	0	24	3	149	65	29.3	2	131/80	1	25	2	4s	1	1	1	1	2
104	60	3	0	2	6	14	0	4	0	24	3	142	70	34.7	3	150/90	2	29	1	5s	2	1	1	1	2
105	68	3	0	2	6	8	1	4	0	21	2	144	47	22.7	1	140/90	2	23	1	7s	2	1	1	1	2
106	65	3	0	2	5	6	2	8	1	19	2	149	42	18.9	1	150/100	2	21	1	7s	2	1	2	3	1
107	65	3	0	2	6	12	0	2	0	24	3	144	45	21.7	1	150/76	1	21	1	4s	1	1	1	0	3
108	80	3	0	2	5	9	1	7	1	17	1	145	59	28.1	2	120/80	2	17	1	8s	2	2	2	3	1
109	60	3	0	2	6	14	0	3	0	24	3	146	50	23.5	1	140/70	2	22	1	6s	2	1	1	1	2
110	60	1	6	1	6	6	2	8	1	23	2	152	38	16.4	0	170/80	2	32	1	6s	2	1	2	3	1
111	65	3	0	2	6	9	1	7	1	24	3	141	55	27.7	2	125/65	2	10	2	6s	2	1	2	3	1
112	60	1	3	2	6	7	2	8	1	23	2	140	56	28.6	2	120/80	2	12	2	6s	2	1	2	3	1
113	61	1	6	1	6	12	0	2	0	24	3	167	61	21.9	1	140/60	2	22	2	5s	2	1	1	2	2
114	64	3	0	2	6	14	0	1	0	24	3	143	53	25.9	2	120/70	2	11	2	4s	1	1	1	1	2
115	60	1	3	2	6	14	0	2	0	25	3	145	67	31.9	3	170/90	1	19	1	4s	1	1	1	0	3
116	65	3	0	2	6	9	1	7	1	22	2	142	43	21.3	1	170/70	1	23	1	5s	2	1	2	2	2
117	70	1	8	1	6	9	1	8	1	23	2	146	50	23.5	1	160/70	2	15	2	5s	2	1	2	3	1
118	70	3	0	2	6	6	2	9	1	19	2	150	39	17.3	0	100/60	2	13	2	7s	2	1	2	4	1
119	60	3	0	2	6	14	0	2	0	24	3	153	47	24	1	140/80	2	12	2	4s	1	1	1	1	2
120	80	1	5	1	5	7	2	12	0	16	1	130	39	23.1	1	170/80	2	11	2	8s	2	2	2	5	1
121	60	3	0	2	6	14	0	2	0	24	3	150	78	34.7	3	140/100	2	14	2	4s	1	1	1	1	2
122	60	3	0	2	6	12	0	1	0	25	3	142	40	19.8	1	110/70	1	23	1	4s	1	1	1	0	3
123	62	1	3	1	6	14	0	3	0	24	3	175	75	24.5	1	140/80	2	22	1	4s	1	1	1	0	3
124	80	3	0	2	6	6	2	8	1	21	2	161	52	20.1	1	160/100	2	34	1	5s	2	1	2	3	1
125	75	3	0	2	6	7	2	9	1	20	2	152	55	24.4	1	150/100	2	22	1	6s	2	1	2	3	1
126	60	1	3	2	6	14	0	2	0	24	3	149	55	24.8	1	150/100	1	33	1	4s	1	1	1	0	3
127	60	1	4	1	6	9	1	9	1	22	2	147	46	21.3	1	140/80	2	21	1	5s	2	1	2	2	2
128	86	2	5	1	5	10	1	10	1	15	1	125	40	25.6	2	120/80	2	10	2	8s	2	2	2	4	1
129	67	1	6	1	6	8	1	11	1	23	2	157	50	20.3	1	130/80	2	14	2	5s	2	1	2	3	1
130	60	1	3	1	6	14	0	2	0	24	3	160	70	27.3	2	140/90	2	21	1	5s	2	1	1	1	2
131	60	1	4	2	6	12	0	3	0	25	3	168	55	19.5	1	110/80	2	22	2	5s	2	1	1	2	2
132	80	3	0	2	6	3	2	13	1	16	1	130	34	20.1	1	100/60	2	12	2	8s	2	1	2	4	1
133	72	3	0	2	5	6	2	9	1	15	2	158	47	18.8	1	170/100	2	23	1	10s	2	2	2	4	1
134	60	1	3	2	6	9	1	9	1	24	3	150	45	20	1	130/80	2	14	2	5s	2	1	2	3	1
135	61	3	0	2	6	8	1	8	1	22	2	142	49	24.3	1	140/80	2	21	1	5s	2	1	2	2	2
136	60	1	5	1	6	14	0	2	0	24	3	156	62	25.5	2	140/90	2	14	2	4s	1	1	1	1	2
137	72	1	3	2	6	8	1	11	1	23	2	154	53	22.3	1	140/80	2	15	2	7s	2	1	2	3	1
138	67	1	6	1	6	13	0	8	1	24	3	156	70	28.8	2	140/90	1	23	1	5s	2	1	2	2	2
139	60	1	5	1	6	14	0	2	0	24	3	170	95	32.9	3	120/80	2	20	1	7s	2	1	1	1	2
140	60	1	6	1	6	10	1	7	1	23	2	148	57	26	2	140/90	2	22	1	6s	2	1	2	2	2
141	60	1	6	1	6	5	2	8	1	21	2	165	50	18.4	0	150/100	2	12	2	6s	2	1	2	4	1
142	80	3	0	2	5	6	2	14	1	15	1	130	45	26.6	2	100/60	2	12	2	9s	2	2	2	5	1
143	60	1	3	2	6	14	0	2	0	24	3	156	60	24.7	1	140/80	1	23	1	4s	1	1	1	0	3
144	65	1	5	1	6	12	0	2	0	25	3	170	60	20.8	1	130/80	2	21	2	5s	2	1	1	2	2

S. no	Age	who will accompany	no of drugs	Polypharmacy	ADL	MNA	MNA status	GDS	GDS status	MMSE	MMSE status	Height (cm)	Weight (cm)	BMI	BMI cat	BP (mm Hg)	Vision	Grip strength	grip category	4m walking test	Speed test	phy activity	Low energy	no of Fried	Frailcat
145	60	3	0	2	6	14	0	1	0	24	3	172	70	23.7	1	140/80	1	22	2	4s	1	1	1	1	2
146	69	1	3	2	6	13	0	2	0	24	3	148	49	22.4	1	100/70	2	21	1	4s	1	1	1	0	3
147	84	3	2	2	6	7	2	10	1	22	2	158	45	18	0	90/70	1	19	1	8s	2	1	2	3	1
148	64	2	3	2	6	14	0	2	0	30	3	154	66	27.8	2	140/90	1	25	2	4s	1	1	1	1	2
149	62	2	2	2	6	14	0	2	0	30	3	155	68	28.3	2	130/90	2	22	1	5s	2	1	1	1	2
150	60	2	4	1	6	11	1	3	0	29	3	150	62	27.6	2	150/90	2	17	1	4s	1	1	2	1	2
151	62	2	2	2	6	14	0	2	0	30	3	158	66	26.4	2	110/80	2	25	2	4s	1	1	1	1	2
152	82	1	3	2	6	7	2	12	1	19	2	153	42	17.9	0	100/60	2	15	2	7s	2	1	2	4	1
153	61	3	0	2	6	11	1	8	1	28	3	150	66	29.3	2	110/70	1	19	1	5s	2	1	2	2	2
154	71	2	4	1	6	14	0	2	0	30	3	160	62	24.2	1	130/90	1	22	2	5s	2	1	1	2	2
155	67	2	6	1	6	14	0	2	0	28	3	158	69	27.6	2	140/90	2	17	1	6s	2	1	2	2	2
156	65	3	0	2	5	6	2	8	1	19	2	149	42	18.9	1	150/100	2	21	1	7s	2	2	2	4	1
157	65	3	0	2	6	12	0	2	0	24	3	144	45	21.7	1	150/76	1	12	2	4s	1	1	1	1	2
158	80	3	0	2	5	9	1	7	1	17	1	145	59	28.1	2	120/80	2	13	2	8s	2	2	2	4	1
159	60	3	0	2	6	14	0	3	0	24	3	146	50	23.5	1	140/70	2	22	2	6s	2	1	1	2	2
160	76	3	0	2	6	8	1	9	1	23	2	164	60	22.3	1	109/60	2	23	2	9s	2	1	2	3	1
161	68	1	4	1	6	9	1	2	0	24	3	150	36	16	0	119/73	2	21	2	8s	2	1	1	2	2
162	77	1	4	1	6	14	0	2	0	24	3	164	63	23.4	1	165/93	2	23	2	8s	2	1	1	2	2
163	60	1	8	1	6	6	2	13	1	23	2	147	39	18	1	168/74	2	22	1	8s	2	1	2	3	1
164	67	2	5	1	6	12	0	4	0	23	2	165	70	25.7	2	140/67	2	27	1	8s	2	1	1	1	2
165	70	1	8	1	6	5	2	12	1	21	2	156	47	19.3	1	133/78	2	22	1	7s	2	1	2	3	2
166	77	1	4	1	6	14	0	3	0	25	3	156	57	23.4	1	167/83	2	32	1	7s	2	1	1	1	2