IDENTIFICATION OF HEALTH PROMOTION PRACTICES AND EFFICACY OF A MULTI-COMPONENT INTERVENTION STRATEGY ON THE QUALITY OF LIFE AMONG RURAL ELDERLY

THESIS

Submitted to The Tamil Nadu Dr. M.G.R. Medical University

for the award of the Degree of

Doctor of Philosophy in Nursing

By

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Certificate

This is to certify that the work embodied in the thesis entitled "**IDENTIFICATION OF HEALTH PROMOTION PRACTICES AND EFFICACY OF A MULTI-COMPONENT INTERVENTION STRATEGY ON THE QUALITY OF LIFE AMONG RURAL ELDERLY**" submitted by **Ms. SHIRLEY JOSEPH** for the award of the Degree of Doctor of Philosophy in Nursing is a bonafide record of research done by her during the period of study under my supervision and guidance, and that it has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other similar title.

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Date: July 2012

Certificate

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****

ABBREVIATIONS

WHO	World Health Organization
HPP	Health promotion practices
BMI	Body Mass Index
CRT	Community randomized trial
RCT	Randomized control trial
CHAD	Community health and development
MCI	Multi-component intervention strategy
QOL	Quality of life
ICC	Intra Cluster Correlation

College of Nursing

Christian Medical College, Vellore

THESIS:

Identification of Health Promotion Practices and Efficacy of a Multi-Component Intervention Strategy on the Quality of Life among rural elderly**.**

ABSTRACT

Health Promotion is an essential component in influencing quality of life especially among the elderly. The number of elderly in Indian population has dramatically risen over the past decades. The main aims of the study were to assess the existing health promotion practices among the rural elderly and to evaluate the efficacy of a multi-component intervention strategy on the quality of life of the elderly. The design chosen was Community Randomized Trial where the villages (clusters) were randomized into experiment and control groups. The study was carried out in Kaniyambadi Block of Vellore District. The total sample size was 146 elders of which 73 belonged to each group. Health promotion practices were assessed using a questionnaire prepared by the investigator and quality of life was measured using the Ferrans' and Powers' Quality of Life Index Generic Version 3. The subjects in the experiment group received the multi -component intervention strategy which was a set of independent nursing interventions that were conducted every day of the week except Sunday, from 9.30 – 12.30 p.m. for a period of 6 months. The control group did not receive the intervention. Pre and post intervention quality of life was assessed. Findings revealed the two

groups of subjects were homogenous in their demography and socio-economic characteristics. The overall prevalence of health promotion practices indicated that 39.9% of subjects were in poor category, 37.4% in moderate and 22.7% scored good. Quality of life scores between the subjects were experiment and control groups were found significant in all four domains (health and functioning, social/economic, psychological and spiritual and family) after the interventions, which proved the efficacy of the multi-component intervention. This thesis provides crucial information on the prevalence of health promotion practices among the rural elderly, of which very little data is known in the Indian setting. Quality of life scores are encouraging after the intervention, which is a sustainable measure that can be easily implemented in the rural setting. Implications for nursing education, practice and research are explained. Above all it sensitizes nurses to the needs of this revered group, and provides evidence that health promotion practices in the form of simple nursing interventions has a positive influence on how the elderly perceive their quality of life.

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"I came that they may have life and life in all its abundance."
-Holy Bible (John 10:10)

CHAPTER 1

INTRODUCTION

1.1. BACKGROUND OF THE STUDY

It is strangely exciting that a little poem which the investigator came across a long time ago could influence her after all these years. This was an innocent yet profound poem by a three year old, looking at a vase of flowers whose petals had begun to fall. It reads thus:

And will the flowers die? And will people die?

And everyday do you grow old, do I grow old? No I'm not old;

Do flowers grow old? Old things-do you throw them out?

Do you throw old people out?(1).

The above poem catalyzed the investigator to contemplate about the condition of the elderly in motherland India, and provided the necessary impetus to undertake this research among the elderly. She has enjoyed caring for elderly with various conditions in the hospital setting, and found that many of their problems stemmed from their health habits or lack of them. The decision to study elders who live at home in the rural setting was because of the investigators rural roots. Knowing firsthand about their living conditions, there was earnest desire to keep this population out of hospitals which are alien surroundings to them. Thus, she set about to gather more information to assist this vulnerable population to enjoy good health within the scarce health care resources that exist in rural in India.

India lives in its villages. At the beginning of the 20th century, 12 million Indians were 60 years or more. That number doubled to 24 million in 1961 and since then, there has been a great increase in the number to 56 million in 1991 and 70 million in 2001. The projected estimate for 2016 is 112 million. The 1991 Census data observed that 78% of the elderly lived in villages; there were 930 females to every 1000 males in the 60 + age group, 52% were illiterate and 39% were still working. The morbidity and disease patterns indicate that 45% of elderly suffer from at least one chronic disease. The top ten diseases among this group are hypertension, cataract, osteoarthritis, chronic obstructive pulmonary disease, diabetes, benign prostatic hypertrophy, dyspepsia, constipation and depression. The top five killer diseases in rural elderly are bronchitis and pneumonia, ischemic heart disease, stroke, cancer and tuberculosis (2).

According to the Situational Analysis of the Elderly in India (June 2011), at the turn of the millennium the size of elderly population constituted 7.4% of the total population in 2001 (males 7.1% and females 7.8%), and was predicted to rise to 12.4% by 2026 (3). In the 2011 Census of India, the sex ratio is 940 females for 1000 males (4). Life expectancy between 2002-2006 was 64.2% for females and 62.6% in males (5).The projected population above 60 years of age as on 1st March 2006-2026 according to demographic indications was 8.2% in 2011, 9.3% in 2016, 10.7% in 2021 and 12.4% in 2026. The size of the elderly population is projected to rise to approximately 140 million by 2021. Statistics show that 75% of elderly have all along been higher in rural than urban areas, and more were females. In the state of Tamilnadu, according the Census 2001, 8.8% were above age of 60 years (3).

Are the elderly in India doomed to a life of gloom, boredom and neglect? What about their health? According to the World Health Organization (WHO) Health Promotion Glossary (1998) (6), empowerment may be a social, cultural, psychological or political

process through which individuals and social groups are able to realize their needs, present their concerns, devise strategies for involvement in decision making and achieve political, social and cultural action to meet those needs. Individual empowerment refers to the individual's ability to make decisions and have control over their personal life. Community empowerment involves individuals acting collectively to gain greater influence and control over the determinants of health and the quality of life in their community. The WHO has provided the following recommendations:

- Enable older people to improve their independence and autonomy through increasing practical know-how.
- Promote empowerment through involvement in groups.
- Increase and share information and knowledge health issues.
- Learn together with older people and share experiences in order to improve quality of life.
- Enhance older person's sense of self-worth through strengthening their personal abilities.
- Give freedom of choice permitting older people to develop and choose healthy life style changes.
- Promote a sense of individual and wider community responsibility.
- Increase self-esteem and motivation by engaging older people in social events.
- Use reminiscence therapy to foster a sense of mutual respect.
- Provide professionals with skills and abilities to empower the target group and to recognize limitations.
- Promote a change in attitudes towards aging, i.e. moving from a passive image of an older person to an active one.

- Help older people to understand the sources of their own power and influence, thus helping them to help themselves.
- Enable older people to understand policy processes related to their health needs in order to encourage them to play an active role.

According to Davies M (1994) (1) the following are pre-requisites for positive aging:

- That aging is not denied
- That our perceptions and understanding of aging are not disempowering
- That the differences between people are acknowledged.

She recommended that acceptance of aging, empowerment, individuality, physical activity, social contact/friendship, developing coping skills, valuing experience and knowledge is promoted; while denial of aging, disempowerment, being stereotyped, sedentary life style, social withdrawal and psychological stress is avoided

Visit any rural district and a sure scene to meet the eye are the elderly men sitting listlessly in small groups, silent most of the time. Their physical condition renders them unable to graze the cattle or collect fire wood from the nearby forests. This situation is so unlike what they had been familiar with, where hard work in the hot sun was a proud part of their lives. The elderly women on the other hand try their hand at helping in the house- hold chores, but not without getting into conflict with ‘educated’ and ‘modern’ daughters- in- law, who prefer electrical grinders to manual grinding stones, and commercial food mixes to freshly prepared spices for daily meals. The elderly women are too frail to take care of the grand children and anyway their child-rearing practices are too ‘old fashioned’ and ‘out dated’.

Is there a need for health promotion and disease prevention in this so-called 'non-productive' age group? Who worked tirelessly to feed, clothe, shelter; gave us education, set us on our feet, organized our marriages with great grandeur, sent us to far away cities to make our fortunes, and gave us freedom to chase our dreams? If in their twilight years we cannot keep our elderly healthy, happy and fulfilled, we have failed in our duty to this revered population. If we can keep them out of hospitals and ensure that they enjoy a good quality of life, we would be paying them back in a miniscule measure.

It was this concept that sparked the investigator's interest, as very little data is available in the Indian context. Her study embarked with the intent of assisting the rural elderly to age gracefully and peacefully, to take time off for themselves, after all those years of living for others. She hopes to set a model in place that would impact policy decisions by the government, would enthuse non-government organizations and communities such that the elderly would be cared for and encouraged to achieve a sense of well being, thereby enhancing their quality of life.

1.2. SIGNIFICANCE AND NEED FOR THE STUDY

The number of elderly people in the Indian population is rapidly rising and it is estimated to reach 10.7% in 2021, according to the Department of Central Statistics, Government of India -2011(5) . The latest figures from the Census of India 2011 indicate that the decadal growth rate stands at 15.60. The population size is 83,30,87,662 in the rural areas and 37,71,05,760 in the urban. The Ministry of Home Affairs defines a rural area as having to fulfill three criteria:

a. Minimum population of 5000
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Population size in rural India is 42,79,17,052 for males and 40, 51,70,610 for females. The literacy rates for males are 82.14% and females are 65.46%. The 2011 Census Provisional Population figures for the state of Tamilnaduis 72,138,958 of which males account for 36,158,871 and females are 35,980,087. Tamilnadu ranks 7th among all the States and Union Territories and constitutes 5.96% of the total population in India .The population size in rural area is 3,71,89,229 and in urban area it is 3,49,49,729. There are 1,86,63,701 males in the rural area while there are 1, 85, 25,528 females. The sex ratio in the State is 995; population density is 572 persons per sq.km., and literacy rate of 86.81% in males and 73.86% in females as compared to 82.42% for males and 64.43% for females in the 2001 Census (4).

In Vellore District, the total population is 39.3 million with 19,59,676 males and 19,68,430 females, of which those above 60 years number 3,12,390 persons (8%). Population

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A holistic approach to health promotion takes into account the wide range of dimensions which encompass the health of an individual: physical, mental, social, spiritual, sexual, and emotional and the interdependence with contextual factors such as environment and society. The success of health promotion interventions is dependent to a large extent on the ability of the elderly to recognize and address this multi-dimensional or holistic notion of health and well-being. Merely focusing on one aspect ignores the way in which other facets are important and effectual. For example, physical exercise such as strength or balance training may lessen the risk of falling-however the social aspects of this intervention may determine the extent to which participants continue attending the exercise classes over the long term. In the development of holistic interventions, the whole social system and other factors such as individual life style (micro level), social and community networks/relationships (e.g. family, colleagues, friends and acquaintances), health and social services (meso level), and the general broader socio-economic, cultural and environmental conditions (macro level) play a role in this connection(7).

Nutbeam (1998) (8) states that older people appear to bring a unique perspective to the definition of 'health' such that it is considered primarily in functional terms, as a "resource for life rather than the object of living". Arcury, Quandt and Bell (2000) (9) studied older adults in rural America and found that seven domains of health maintenance behaviors

were important to older people: eating right, drinking water, exercising, staying busy, being with people, trusting in God, taking care of oneself. These older people believed that health was intrinsically related to a balanced participation in activities of the community, remaining socially integrated and taking responsibility for their own health.

An agreed upon definition of quality of life has proven to be a challenge. One model proposed integrates objective and subjective indicators, a broad range of life domains and individual values. Considerable agreement exists that Quality of life (QOL) is multidimensional. Coverage may be categorized within five dimensions: physical well being, material well being, social well being, emotional well being, development and activity. At its most fundamental level, QOL is understood to be both subjective and multidimensional. Because subjective, it is best measured from the patient's perspective. Because it is multidimensional, its measurement requires the investigator to enquire about a range of areas of the patients' life, including physical well being, function ability, emotional well being and social well being. Others define QOL as a broad range of human experiences related to one's overall well being. It implies value based on subjective functioning in comparison with personal expectations and is defined by subjective experiences, states and perceptions. QOL by its very nature is idiosyncratic to the individual, but interactively meaningful and understandable to most people (9).

The link between nursing and patient perspectives on quality of life represents the merger of nurses' knowledge of disease, health, human development as well as respect for patients with the perceptions, values and preference of patients. Nursing as a discipline has found multiple though differing conceptualizations to be useful. Most of these are derived not directly from patients but from available literature and clinical observation. The latter two sources are valid and valuable, but direct participation of patients in defining their quality of

life adds to the validity and value of the existing definitions. A broad global definition will provide valuable flexibility when cultures and other large groups are being compared. In contrast, a consensus definition and conceptualization that is narrowly focused can be matched with an equally focused measurement approach. At present four domains are commonly included in nursing literature: physical functioning, emotional /psychological functioning, social functioning and disease/treatment related symptoms (10).

As life span is lengthened, maintaining a satisfactory quality of life, free of major ailments is a challenge to the individual, family, community and country. If the elder can be encouraged to follow simple health promotion practices, they can enjoy a healthy life, free from illness and disabilities. Further, if they are subjected to regular screening and treatment of chronic illness, they would be pain- free and comfortable for the remainder of their lives. While encouraging them to be independent, making them aware of healthy practices in relation to nutrition, exercise, rest and relaxation, as well as safe home environment, will ensure that they enjoy a better quality of life.

Elders need support and assistance in utilizing their time while leading a satisfied and healthy life, with the respect and love they deserve. The investigator fervently hopes that by carrying out this study among the rural elderly, the family, community, and the country will be sensitized to the fact that this group is a vulnerable, yet valuable group to society.

1.3. STATEMENT OF THE PROBLEM

A community randomized trial to identify the health promotion practices and the efficacy of a multi - component intervention strategy on the quality of life among rural elderly in Vellore district.

1.4. AIMS OF THE STUDY

- To identify the existing health promotion practices among the rural elderly and promote healthy life styles.
- To evaluate the efficacy of a multi- component intervention strategy on the quality of life of rural elderly.

1.5. OBJECTIVES OF THE STUDY

1. To identify the prevalence of health promotion practices (HPP) among rural elderly.
2. To determine quality of life (QOL) among the elderly.
3. To measure the efficacy of the multi- component intervention strategy (MCI) on the QOL of the experiment and control group.
4. To study the association between HPP and QOL among the elderly
5. To identify association between HPP and selected demographic and socio - economic variables.
6. To determine the association between QOL and selected demographic and socio - economic variables.s

1.6. OPERATIONAL DEFINITIONS

1) ***Health Promotion Practices:*** Refers to the activities/measures undertaken by the rural elderly in relation to Primary and Secondary prevention of diseases and healthy living.
    a. ***Primary prevention****:* Practices that include adherence to healthy behaviors viz:
        i. **Diet**: Having three regular meals that are tasty and easy to chew, restriction of fatty foods (oily preparations), foods high in salt content,

inclusion of fruit, vegetables, legumes, cereals, milk, and at least 6-8 glasses of fluids.

ii. **Exercise:** Helping in house-hold chores, simple isometric exercises performed for 10 –15 minutes every day, and going for short walks every day.

iii. **Injury prevention**: Avoiding falls and accidents by ensuring a safe home environment with adequate lighting, ventilation, clean and dry floors. Also included are provision of hand grips in toilets, the use of walking stick, spectacles / hearing aids and getting adequate help, while moving around.

iv. **Self -care activities:** Self-grooming in relation to bathing, dressing, toileting and washing clothes.

v. **Sleep and relaxation:** Having restful sleep at night, taking short naps during day, watching television, spending time with friends.

vi. **Chemoprophylaxis**: Adhering to medications prescribed as prophylaxis, reporting side effects, if experienced and having immunizations as prescribed.

b. ***Secondary prevention****:* Refers to practices that aid in detection of disease in potential elders at an early stage:

i. Attending preventive health services whenever conducted

ii. Adherence to treatment as prescribed

iii. Compliance with prescribed medication and required investigations as ordered

iv. Follow-up clinic visits.

2) ***Multi-Component Intervention Strategy:*** A variety of independent nursing interventions involving physical, social, recreational, educative and health awareness activities that will be carried out from Monday to Saturday between 9.30 am to 12.30 pm every week for six months, with a specific aim to improve the quality of life of rural elderly. They include:

   i. Daily isometric exercise schedule as per recommendation of Age–Care India (1999).
   ii. Daily social interaction between the elderly where one topic of general interest would be discussed.
   iii. Daily recreational activities involving playing of indoor and outdoor games:

      Indoor – Brainvita, 'Daayam', Snakes & Ladders, and Ludo.

      Outdoor – Simple ball games
   iv. Daily consumption of locally prepared health snack and drink.
   v. Daily progressive muscle relaxation exercises according to Jacobson (1963).
   vi. Weekly discussion on health-related topics.
   vii. Weekly dietary counseling using South Indian Rural Food Guide Pyramid for Elderly, as recommended by the Dietary Department, CMC, Vellore.
   viii. Nutritional assessment of anthropometric measures of height and weight from which Body Mass Index (BMI), which is calculated once at the beginning before the MCI and once after 6 months, at the end of the study.

3) ***Efficacy:*** Evidence that the MCI has resulted in improvement in quality of life of the rural elderly in the experiment group as compared to the control group, as analyzed pre and post MCI using the Ferrans' and Powers' Quality of Life Index (Generic Version III). It is estimated to achieve an increase in QOL scores from an estimated 25% at baseline to more than 50% post MCI.
4) ***Quality of Life:*** The perceived well being of the elderly as elicited by the Ferrans' and Powers' Quality of Life Index Generic Version III, which deals with how "**satisfied**" and how "**important**" the individual perceives specific domains of life which include health and functioning, social and economic, psychological/spiritual and family. QOL will be measured twice during the course of the study- at the beginning and at the end of the program, after six months.
5) ***Rural elderly:*** Refers to men and women belonging to the age group of 60 years and above, who reside in selected villages in Kaniyambadi Block of Vellore district.
6) ***Demographic and socio-economic variables:*** Personal details of age, sex, education, marital status, occupational status, financial stability, relationship to care-giver, personal habits of smoking, alcohol consumption and any other habit viz. chewing paan, betel, or tobacco, dietary preference, BMI and existing co-morbidity

1.7. RESEARCH HYPOTHESES

1) There is significant improvement in QOL among elderly receiving the MCI in the experiment group, as compared to the elderly in the control group who do not receive the MCI , as measured using the Ferrans' and Powers' QOL Index Version 3 . The level of significance at $p < 0.05$ is considered to be significant and $p < 0.001$ is considered to be highly significant.
2) There is a significant association between HPP and QOL among rural elderly.

3) There is significant association between HPP and QOL of the elderly with selected demographic and socio-economic variables.

1.8. ASSUMPTIONS

1) There is a prevalence of moderate to poor HPP among the rural elderly.
2) The QOL among rural elderly is poor.

1.9. PROJECTED OUTCOMES

The study aims to ensure that the rural elderly receive the attention, care and health awareness that they deserve. The findings will demonstrate lacunae in the existing living conditions of the elderly with an aim to rectify the same at the earliest. It is an earnest desire that Government and NGO's would be convinced to initiate policies and programs that will directly benefit this vulnerable group, and start regular elder -care centers in all villages, along with a noon meal scheme and prophylactic immunizations against pneumonia and other communicable diseases. It is an effort to assist the elders to enjoy an improvement in the overall quality of life, and spend their twilight years in peace, with dignity, self-respect and good health in mind and body. It is envisaged that the study would empower the elderly to take responsibility for their own health and identify themselves as important members of society.

"I came that they may have life and life in all its abundance."
-Holy Bible (John 10:10)

CHAPTER 1

INTRODUCTION

1.2. BACKGROUND OF THE STUDY

It is strangely exciting that a little poem which the investigator came across a long time ago could influence her after all these years. This was an innocent yet profound poem by a three year old, looking at a vase of flowers whose petals had begun to fall. It reads thus:

And will the flowers die? And will people die?

And everyday do you grow old, do I grow old? No I'm not old;

Do flowers grow old? Old things-do you throw them out?

Do you throw old people out?(1).

The above poem catalyzed the investigator to contemplate about the condition of the elderly in motherland India, and provided the necessary impetus to undertake this research among the elderly. She has enjoyed caring for elderly with various conditions in the hospital setting, and found that many of their problems stemmed from their health habits or lack of them. The decision to study elders who live at home in the rural setting was because of the investigators rural roots. Knowing firsthand about their living conditions, there was earnest desire to keep this population out of hospitals which are alien surroundings to them. Thus, she set about to gather more information to assist this vulnerable population to enjoy good health within the scarce health care resources that exist in rural in India.

India lives in its villages. At the beginning of the 20^{th} century, 12 million Indians were 60 years or more. That number doubled to 24 million in 1961 and since then, there has been a great increase in the number to 56 million in 1991 and 70 million in 2001. The projected estimate for 2016 is 112 million. The 1991 Census data observed that 78% of the elderly lived in villages; there were 930 females to every 1000 males in the 60 + age group, 52%

were illiterate and 39% were still working. The morbidity and disease patterns indicate that 45% of elderly suffer from at least one chronic disease. The top ten diseases among this group are hypertension, cataract, osteoarthritis, chronic obstructive pulmonary disease, diabetes, benign prostatic hypertrophy, dyspepsia, constipation and depression. The top five killer diseases in rural elderly are bronchitis and pneumonia, ischemic heart disease, stroke, cancer and tuberculosis (2).

According to the Situational Analysis of the Elderly in India (June 2011), at the turn of the millennium the size of elderly population constituted 7.4% of the total population in 2001 (males 7.1% and females 7.8%), and was predicted to rise to 12.4% by 2026 (3). In the 2011 Census of India, the sex ratio is 940 females for 1000 males (4). Life expectancy between 2002-2006 was 64.2% for females and 62.6% in males (5).The projected population above 60 years of age as on 1st March 2006-2026 according to demographic indications was 8.2% in 2011, 9.3% in 2016, 10.7% in 2021 and 12.4% in 2026. The size of the elderly population is projected to rise to approximately 140 million by 2021. Statistics show that 75% of elderly have all along been higher in rural than urban areas, and more were females. In the state of Tamilnadu, according the Census 2001, 8.8% were above age of 60 years (3).

Are the elderly in India doomed to a life of gloom, boredom and neglect? What about their health? According to the World Health Organization (WHO) Health Promotion Glossary (1998) (6), empowerment may be a social, cultural, psychological or political process through which individuals and social groups are able to realize their needs, present their concerns, devise strategies for involvement in decision making and achieve political, social and cultural action to meet those needs. Individual empowerment refers to the individual's ability to make decisions and have control over their personal life. Community empowerment involves individuals acting collectively to gain greater influence and control

over the determinants of health and the quality of life in their community. The WHO has provided the following recommendations:

- Enable older people to improve their independence and autonomy through increasing practical know-how.
- Promote empowerment through involvement in groups.
- Increase and share information and knowledge health issues.
- Learn together with older people and share experiences in order to improve quality of life.
- Enhance older person's sense of self-worth through strengthening their personal abilities.
- Give freedom of choice permitting older people to develop and choose healthy life style changes.
- Promote a sense of individual and wider community responsibility.
- Increase self-esteem and motivation by engaging older people in social events.
- Use reminiscence therapy to foster a sense of mutual respect.
- Provide professionals with skills and abilities to empower the target group and to recognize limitations.
- Promote a change in attitudes towards aging, i.e. moving from a passive image of an older person to an active one.
- Help older people to understand the sources of their own power and influence, thus helping them to help themselves.
- Enable older people to understand policy processes related to their health needs in order to encourage them to play an active role.

According to Davies M (1994) (1) the following are pre-requisites for positive aging:

- That aging is not denied
- That our perceptions and understanding of aging are not disempowering
- That the differences between people are acknowledged.

She recommended that acceptance of aging, empowerment, individuality, physical activity, social contact/friendship, developing coping skills, valuing experience and knowledge is promoted; while denial of aging, disempowerment, being stereotyped, sedentary life style, social withdrawal and psychological stress is avoided

Visit any rural district and a sure scene to meet the eye are the elderly men sitting listlessly in small groups, silent most of the time. Their physical condition renders them unable to graze the cattle or collect fire wood from the nearby forests. This situation is so unlike what they had been familiar with, where hard work in the hot sun was a proud part of their lives. The elderly women on the other hand try their hand at helping in the house- hold chores, but not without getting into conflict with 'educated' and 'modern' daughters- in- law, who prefer electrical grinders to manual grinding stones, and commercial food mixes to freshly prepared spices for daily meals. The elderly women are too frail to take care of the grand children and anyway their child-rearing practices are too 'old fashioned' and 'out dated'.

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11. To identify association between HPP and selected demographic and socio - economic variables.
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inclusion of fruit, vegetables, legumes, cereals, milk, and at least 6-8 glasses of fluids.

ii. **Exercise:** Helping in house-hold chores, simple isometric exercises performed for 10 –15 minutes every day, and going for short walks every day.

iii. **Injury prevention**: Avoiding falls and accidents by ensuring a safe home environment with adequate lighting, ventilation, clean and dry floors. Also included are provision of hand grips in toilets, the use of walking stick, spectacles / hearing aids and getting adequate help, while moving around.

iv. **Self -care activities:** Self-grooming in relation to bathing, dressing, toileting and washing clothes.

v. **Sleep and relaxation:** Having restful sleep at night, taking short naps during day, watching television, spending time with friends.

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Outdoor – Simple ball games

iv. Daily consumption of locally prepared health snack and drink.

v. Daily progressive muscle relaxation exercises according to Jacobson (1963).

vi. Weekly discussion on health-related topics.

vii. Weekly dietary counseling using South Indian Rural Food Guide Pyramid for Elderly, as recommended by the Dietary Department, CMC, Vellore.

viii. Nutritional assessment of anthropometric measures of height and weight from which Body Mass Index (BMI), which is calculated once at the beginning before the MCI and once after 6 months, at the end of the study.

9) ***Efficacy:*** Evidence that the MCI has resulted in improvement in quality of life of the rural elderly in the experiment group as compared to the control group, as analyzed pre and post MCI using the Ferrans' and Powers' Quality of Life Index (Generic Version III). It is estimated to achieve an increase in QOL scores from an estimated 25% at baseline to more than 50% post MCI.

10) ***Quality of Life:*** The perceived well being of the elderly as elicited by the Ferrans' and Powers' Quality of Life Index Generic Version III, which deals with how "**satisfied**" and how "**important**" the individual perceives specific domains of life which include health and functioning, social and economic, psychological/spiritual and family. QOL will be measured twice during the course of the study- at the beginning and at the end of the program, after six months.

11) ***Rural elderly:*** Refers to men and women belonging to the age group of 60 years and above, who reside in selected villages in Kaniyambadi Block of Vellore district.

12) ***Demographic and socio-economic variables:*** Personal details of age, sex, education, marital status, occupational status, financial stability, relationship to care-giver, personal habits of smoking, alcohol consumption and any other habit viz. chewing paan, betel, or tobacco, dietary preference, BMI and existing co-morbidity

1.7. RESEARCH HYPOTHESES

4) There is significant improvement in QOL among elderly receiving the MCI in the experiment group, as compared to the elderly in the control group who do not receive the MCI , as measured using the Ferrans' and Powers' QOL Index Version 3 . The level of significance at $p < 0.05$ is considered to be significant and $p < 0.001$ is considered to be highly significant.

5) There is a significant association between HPP and QOL among rural elderly.

6) There is significant association between HPP and QOL of the elderly with selected demographic and socio-economic variables.

1.8. ASSUMPTIONS

3) There is a prevalence of moderate to poor HPP among the rural elderly.
4) The QOL among rural elderly is poor.

1.9. PROJECTED OUTCOMES

The study aims to ensure that the rural elderly receive the attention, care and health awareness that they deserve. The findings will demonstrate lacunae in the existing living conditions of the elderly with an aim to rectify the same at the earliest. It is an earnest desire that Government and NGO's would be convinced to initiate policies and programs that will directly benefit this vulnerable group, and start regular elder -care centers in all villages, along with a noon meal scheme and prophylactic immunizations against pneumonia and other communicable diseases. It is an effort to assist the elders to enjoy an improvement in the overall quality of life, and spend their twilight years in peace, with dignity, self-respect and good health in mind and body. It is envisaged that the study would empower the elderly to take responsibility for their own health and identify themselves as important members of society.

CHAPTER 2

REVIEW OF LITERATURE

The investigator undertook an extensive literature survey to shed light on the research topic. The review of literature is presented under the following sections:

2.1.Concept of Age and Aging – Definitions, theories (biological, psychological and sociological), physiological changes associated with aging and successful aging

2.2. Health Promotion Practices – Concepts, research on health promotion among the elderly

2.3- Quality of Life – Concepts, research on quality of life among the elderly

2.1. Concept of Age and Aging

2.1.1 Definitions of aging

The word *'Age'*probably comes from *aevum,*(lifetime),which is Latin in origin. Its first known usage is thought to be from the 13th century (11). The first formal studies of aging appear to be those of Muhammad ibn Yusuf al-Harawi (1582) in his book *Ainul Hayat,* which was scribed in 1532(12).*Aging* (British English) or *aging* (American English) is the accumulation of changes in a person over time(13).

Most developed world countries have accepted the chronological age of 65 years as a definition of 'elderly' or older person. While this definition is somewhat arbitrary, it is many times associated with the age at which one can begin to receive pension benefits. At the moment, there is no United Nations standard numerical criterion, but the UN agreed cutoff is 60+ years to refer to the older population.German Chancellor Otto von Bismarck created the world's first comprehensive government social safety net in the 1880s, providing for old age pensions and setting 60 as the age of retirement. The fixed retirement age of 70 was the first attempt at defining the start of old age (14). In the United States of America, and the United

Kingdom, the age of 65 was traditionally considered the beginning of the senior years because, until recently, United States and British people became eligible to retire at this age with full social security benefits (13).

Aging is any change in an organism over time and it refers to a multidimensional process of physical, psychological, and social change. Some dimensions of aging grow and expand over time while others decline. Reaction time, for example, may slow with age, while knowledge of world events and wisdom may expand. Aging is an important part of all human societies reflecting the biological changes that occur, but also reflecting cultural and societal conventions. *Chronological aging*, referring to how old a person is, is arguably the most straightforward definition of aging and may be distinguished from *Social aging* (society's expectations of how people should act as they grow older) and *Biological aging* (an organism's physical states as it ages) (15). However, distinctionneeds to be made between *Universal aging* (age changes that all people share) and *Probabilistic aging* (age changes that may happen to some, but not all people as they grow older). Chronological age does not correlate perfectly with functional age, i.e. two people may be of the same age, but differ in their mental and physical capacities. Population aging is the increase in the number of proportion of older people in society. Population aging has three possible causes: migration, longer life expectancy (decreased death rate), and decreased birth rate (16).

Psychologic aging: Refers to behavioral changes, changes in self - perception and reactions to the biologic changes. *Sociologic aging*: Refers to the roles and social habits of individuals in society. *Spiritual aging*: Refers to changes in self and perceptions of self, of relationships of self to others, of the place of self in the world, and of the self's world view(13).

Gerontology, Geriatricsand the Definitions of Aging

Gerontology is the branch of biomedical sciences that studies aging.It normally refers to the study of the biological process of aging, not its medical consequences.Technically, gerontology includes both the biological and the medical branches of the study of aging; *Bio-gerontology* refers specifically to the biological study of aging and is also used, usually interchangeably, with gerontology.*Geriatrics* refers specifically to the medical study of diseases and problems of the elderly.*Life expectancy* is how long, on average, an organism can be expected to live. *Longevity* is the period of time an organism is expected to live under ideal circumstances.*Lifespan* is defined as the period of time in which the life events of a species or sub-species (e.g., a strain or population) typically occur(17).

Aging, the process of growing old, is defined as the gradual biological impairment of normal function, probably as a result of changes made to cells and structural components.The following is a description setting out five criteria for aging, as proposed by **Strehler** in1962:

1. *Cumulative*: Effects of aging increase with time.
2. *Universal*: All members of a species display signs of aging.
3. *Progressive*: Aging is a series of gradual changes.
4. *Intrinsic*: Changes would take place even in a “perfect” environment.
5. *Deleterious*: Changes which occur compromise normal biological functions (18).

Definitions of aging differ between biologists and behavioral scientists. Biologists regard aging as reflecting the sum of multiple and typical biological decrements occurring after sexual maturation; behavioral scientists view it as reflecting regular and expected changes occurring in genetically representative organisms advancing through the life cycle under normal environmental conditions. It is difficult to define normal aging, since many changes observed in older adults and previously perceived as concomitants of normal aging are now

recognized as effects of disease in later life.*Senescence* is not always equated with aging; it is viewed as the increasing vulnerability or decreasing capacity of an organism to maintain homeostasis as it progresses through its life span. *Life expectancy* is the average number of years of life in a given species; it is significantly influenced by factors beyond aging alone, such as famine and disease. *Life span* is the maximum number of years of life possible for that species; it is more fundamentally linked to the process of aging itself. Over the centuries, life expectancy has increased (due to improved sanitation and health care practices); life span has not. Approximately 115 years appears to be the upper limit of life span in humans(19).

Elderly or old age consists of ages nearing or surpassing the average life span of human beings. The boundary of old age cannot be defined exactly because it does not have the same meaning in all societies. Government of India adopted 'National Policy on Older Persons' in January, 1999. The policy defines 'senior citizen' or 'elderly' as a person who is of age 60 years or above(3).

To summarize, aging is a complex process composed of several features a) an exponential increase in mortality with age b) physiological changes that typically lead to a functional decline with age c) increased susceptibility to certain disease with age. So, aging may be defined as a progressive deterioration of physiological function, an intrinsic age – related process of loss of viability and increase vulnerability(17).

2.1.2 Theories of aging

Biologic Theories of Aging

Biologic theories of aging are concerned with answering basic questions regarding the physiologic processes that occur in all living organisms as they chronologically age.

i. Mutation accumulation theory: This theory suggests that genes that have negative effects in later life gradually increase in population, because they are not weeded out by natural selection. Although this theory seems logical, there has been little research support.

ii. Disposable Soma theory: This theory proposes that once the organism has reproduced, it is disposable. As a result, humans are not programmed to continue maintenance and repair of the body after reproduction processes, rendering the soma disposable.

iii. Antagonistic Pliotropy theory: Pliotropy is defined as having more than one genetic effect. This theory states that genes may be selected because they positively influence early life through reproduction, but just happens to have negative effects on health in later life. Aging may ultimately result from evolutionary neglect rather than an active process that causes aging genes beneficial at younger age to become dangerous at older ages. The latter two theories have some research support which may help provide a general frame work for explaining aging, even though they do not point to specific mechanisms at work.

iv. Hayflick Limit theory: This showed that there are functional changes that do occur within cells and are responsible for the aging of the cell and organisms. The study supported that the hypothesis that a cumulative effect of improper functioning of cells and eventual loss of cells in organs and tissues is responsible for the aging phenomenon. However they found that freezing the cells halts the biologic cellular clock. Therefore, it is sometimes called the "Biological Clock, "Cellular Aging" or "Genetic Theory" as well as the Program theory of Aging.

a. Molecular Theories

The molecular theories explore genetic influences on aging. Yeast, nematodes, fruit flies and mice have genes called LAG – I (Longevity assurance gene), that scientists have

directly related to the life span. By altering these genes, researchers have been able to extend the life span of the organism. Studies in animals have shown that some genes can affect other genes, the stress response, nutritional effects, and metabolic capability, which in turn affects the aging process.

i. Gene regulation theory: Aging is caused by changes in the expression of genes regulating both development and aging. This theoryproposes that genes regulate aging and development through differential action throughout the life span.

ii. Codon restriction (Transcription): This molecular theory proposes that damage to the molecules or genes results in aging. In this theory, messenger RNA (mRNA) translation is impaired due to inability to decode codons in mRNA.*Somatic mutation theory*suggests that damage to DNA is by faulty synthesis of DNA and / or RNA. *Dysdifferentiation theory* causes random molecular damage that impairs gene expression. Gradual accumulation of random molecular damage impairs regulation of gene expression.

iii. Error catastrophe theory: It is thought that this process may occur through changes in the base pairing or coding of deoxyribonucleic acid (DNA) or through increased levels of error in ribonucleic acid (RNA) transcription or protein synthesis.

b. Cellular Theories

These theories explore factors that affect cell division and cumulative damage to cells that result in cell senescence. All of the cells can divide initially, but with age, many stop dividing, although they continue to function well. In studies *in vitro*, researchers have found that cells have a finite number of cell divisions, called the Hayflick limit. E.g. fibroblasts will divide about 50 times in a test tube. After they stop dividing, these senescent cells also change their function, releasing enzymes that could increase the risk of cancer in later life.

i) Cellular senescence – Telomere theory: This theory looks at the role of telomeres, which are the ends of chromosomes involved in stabilizing and protecting the chromosome. They do not carry genetic information. However, the ends of the telomeres are not completely reproduced when chromosomes divide. Telomeres become shorter with cell division and ultimately cells stop dividing or reach cell senescence. Some cells use the enzyme telomerase to restore the telomeres and also play a role in cancer as they regulate production of immortal cells that divide endlessly.

ii) Free radical theory: Free radicals are highly reactive cellular components called reactive oxygen species (ROS) that cause molecular damage. Free radicals do not contain useful biological information and replace genetic order with randomness. These faulty molecules and cellular debris accumulates in the nucleus and cytoplasm over the life time of a cell. This debris can cause cumulative cell damage and cell senescence.

iii. Protein modification theory: According to this theory, cross-linking produces altered proteins called “advanced glycation end products”. An accumulation of these compounds over a life time produces the random, irregular binding which interferes with normal cell functioning. Cross linkage is proposed as a primary cause for arteriosclerosis, a decrease in efficiency of immune system with age, and the loss of elasticity often seen in older adult skin.

iv. Wear and Tear theory: Cells wear out from normal use, ultimately resulting in cell death. This theory reflects a belief that organs and tissues have a pre -programmed amount of energy available to them and eventually wear out when the allotted energy is expended, leading to the death of the entire organism.

v) Apoptosis - Programmedcell death from genetic events or genome crisis.This mechanism can be adaptive, but excessive cell loss may be responsible for diseases related to aging such as Alzhiemer's disease.

vi) Clinker Theory is a mix of somatic, cross – link and free radical theories.

c. System theories:

These theories explore the impact of the body's regulatory systems on aging, including the neurological – endocrine systems and the immune system. These systems help the body to respond and adapt to both internal and external stimuli by their impact on other body systems. Declines in the organs and functions of these systems may play a role in aging.

i)Neuro-endocrine theory: This theory explores the effect of hormonal and nerve regulatory systems on aging. Changes over time may affect aging through the hypothalamic pituitary – adrenal axis, ultimately affecting hormones and growth factors. Decline in reproductive hormones are examples of aging changes related to this system as well as reduced sympathetic responses with age.

ii)Immunity Theory:As each person ages, the immune system functions less effectively. The term *immunosenescence* has been given to age – related decrease in immune function. This results in decreased resistance to infections, diseases and increased incidence of auto-immunity.

iii)Rate of living theory: This theory presumes a fixed rate of metabolic potential for every living organism. The body's metabolic rate may have a role in aging as proposed by the rate of living theory, as species that have a shorter life span have faster metabolic rates. The

shorter life span may be related to faster cell respiration, which causes the development of free radicals that may ultimately be responsible for aging (20).

DNA Damage Theory of Aging: DNA damage is thought to be the common pathway causing both cancer and aging.Known causes of cancer (radiation, chemical and viral) account for about 30% of the total cancer burden and for about 30% of the total DNA damage. DNA damage causes the cells to stop dividing or induce apoptosis, often affecting stem cell pools and hence hindering regeneration. It has been argued, too, that intrinsic causes of DNA damage are more important drivers of aging (21).

Mitohormesis: Somatic mutations accumulate with age, and are associated with malfunctioning of mitochondria. Many scientists believe that mitochondrial aging in an important contributor to aging in general. It has been known since the 1930's that restricting calories while maintaining adequate amounts of other nutrients can extend lifespan in laboratory animals. Recently, there is evidence for the theory that this effect is due to increased formation of free radicals within the mitochondria causing a secondary induction of increased antioxidant defence capacity (22).

Misrepair-Accumulation Theory: The theory suggests that aging is the result of the accumulation of "Misrepair". This term describes the remaining defective structure after reparation has taken place.accumulates with time and causes gradually the disorganization of a structure (tissue, cell, or molecule); this is the actual source of aging (23).

Psychological Theories

As a person ages psychologically, various adaptive changes occur that assist in coping with or accept biologic changes. Some of the adaptive mechanisms include: memory,

learning capacity, feelings, intellectual functioning and motivation to do or not to do particular activities.

i) Maslow's Hierarchy of Human Needs theory: According to this theory, each individual has an innate internal hierarchy of needs that motivates all human behaviors viz.biologic or physiologic integrity, safety and security, belonging, self-esteem and self-actualization.

ii) Jung's Theory of Individualism: In this theory, as the person ages chronologically, the personality often begins to change from being outwardly focused and concerned about establishing oneself in society, to becoming more inward, as the person begins to search for answers from within.

iii) Course of Human life theory: The focus of this theory is that self-fulfillmentis the key to healthy development and that unhappy or maladjusted people are unfulfilled in some way.

iv) Eight stages of life theory: This theory reflects cultural and societal influences on individual's ego structure, or sense of self, in balancing the search for integrity and wholeness.

v) Developmental Task theory: In this theory, each individual must learn specific developmental tasks at various stages of life, the successful completion contribute to feelings of happiness and success:physical maturation, cultural expectations of society, personal values and aspirations. (24).

Sociologic Theories of Aging

Sociologic theories differ from biologic theories in that they tend to focus on roles and relationships in which each individual participates in later life. These theories focus on more global, societal and structural factors that influence the lives of the aging person.

i)Disengagement theory: Aging is viewed as a developmental task in and of itself, with its own norms and appropriate patterns of behavior.

ii)Activity theory: This theory proposed that people need to stay active if they are to age successfully. By being active, the older person stays young and alive and does not have to withdraw from society because of an age parameter.

iii)Continuity theory: This theory proposes that as people age, they try to maintain previous habits, preferences, commitments, values, beliefs and all factors that have contributed to their personalities.

iv)Selectivity theory: Mediates between Activity and Disengagement Theory, which suggests that it may benefit older people to become more active in some aspects of their lives, more disengaged in others.

v)Age stratification theory: This is the only theory addressing societal values. The key issue is the concept of interdependence between the aging person and society at large. According to this theory, the aging person is viewed as an individual element of society and also as a member with peers as a social process.

vi)Person – Environment fit theory: This theory examines the concept of inter-relationships between competencies of a group of people, older adults and their society or environment, especially competencies such as ego strength, level of motor skills, individual biologic strength, cognitive and sensory perceptual capacities. The theory also proposes that as a person ages, the environment becomes more threatening and one may feel incompetent in dealing with it(25).

Non – Biological Theories:

i) Modernization theory: This is the view that the status of the elderly has declined since industrialization and the spread of technology.

ii) Cognitive theory: A view of aging that emphasizes individual subjective perception, rather than actual objective change itself, as the factor that determines behavior associated with advanced age.

iii)Demographic Transition theory: The idea that population aging can be explained by a decline in both birth rates and death rates following industrialization.

iv) Disuse theory: The idea states that cognitive and physical skills will atrophy unless one continuously practices them.

v) Exchange theory: The idea that interaction in social groups is based on the reciprocal balancing of rewards depending on actions performed.

vi) Political Economy theory: A societal perspective on the aging process that explains that the status and resources of the elderly, as well as how people age, are shaped by each person's place in the social structure and the economic and political forces that impact their socio-political location(26).

Aging and Senescence

The terms 'Aging' & 'Senescence' are frequently used interchangeably as both are considered to be fundamental and intrinsic properties of living organisms. *Aging* can be defined as "the sum of all the changes that normally occur in an organism with the passage of time". *Senescence* is the programmed deterioration of the characteristics and processes. Scientists have been trying to develop a theory or theories of aging for centuries.

Evolutionary Senescence Theory of Aging

The most widely accepted overall theory of aging is currently the evolutionary senescence theory of aging. Unlike the earlier programmed theory of evolution and aging which tried to find reasons why evolution might favor aging, evolutionary senescence theory focuses on the failure of natural selection to be able to affect late life traits. Although many scientists believe the evolutionary theory of aging needs further refinement, most agree that it is currently the best explanation for why we and other organisms age. A critical issue in aging research is whether aging is affected by one, several or a multitude of underlying processes. If there are hundreds of different biological pathways that affect aging, then science would never be able to devise a way of slowing down how we age or even understand why aging happens at all. In the words of **Steven Austad** "all life extending genes investigation in detail have preened out to manifest side effects. As we move toward the developments of interventions in the aging process in the not too distant future we must not forget this"(27).

Today there is a growing consensus among experts about how and why we age. Theories of aging can be divided into two categories

- Those that answer the question "**Why** do we age"
- Those that address the question **"How** do we age"

1. ***The cross –linking /glycation hypothesis of aging :*** Cross linking hypothesis is based on the observation that with age, proteins, DNA and other structural molecules develop inappropriate attachments or cross links to one another. These unnecessary links or bonds are not eliminated in the body and result in aging.

2. ***The oxidative – damage / free radical hypothesis of aging:*** Free radicals are toxic byproducts of normal cell metabolism. Those that escape elimination accumulate over

time and can cause oxidative damage. Some fruit fly studies suggest that oxidative damage is one of the direct causes of aging.

3. ***The genome maintenance hypothesis of aging:*** Damage to one's DNA happens throughout life, caused by oxidative damage, mistakes in replication or outside environmental factors such as radiation or toxins. Most of these mutations will be corrected and eliminated, but some will not. They could accumulate eventually, causing the cells to malfunction and die. This process, it has been suggested is a crucial component in the aging process.

4. **Neuroendocrine hypothesis of aging:**Researchers studying hormones regulated by the brain thought that later – life reduction of hormones such as estrogen that accompanied menopause, was responsible for aging. However, experimental evidence in mice from 1960's shows the opposite. Reduction in hormones can lengthen life (28).

2.1.3 Physiological Changes in Aging

Most of the normal changes of aging have no impact on normal functioning, although they become apparent when the body is placed under stress (e.g., acute illness, physical exertion). Untreated disease can result in "excess disability" and reduce the quality of life of individuals. Much of the illness and disability associated with aging is related to modifiable lifestyle factors that are present in middle age (29).

Changes in Cardiovascular System: The maximum heart rate decreases and it takes longer for heart rate and blood pressure to return to normal resting levels after exertion. The aorta and other arteries become thicker and stiffer which may bring a moderate increase in systolic blood pressure with aging. In some individuals, this may result in hypertension. The valves

between the chambers of the heart thicken and become stiffer. As a result heart murmurs are fairly common among older adults. The pacemaker of the heart loses cells and develops fibrous tissue and fat deposits. These changes may cause a slightly slower heart rate and even heart block. Aberrant heart rhythms and extra heart beats become more common. The baroreceptors which monitor blood pressure become less sensitive. Quick changes in position may cause dizziness from orthostatic hypotension(30).

Changes in Respiratory System: The lungs become stiffer, muscle strength and endurance diminish, and the chest wall becomes more rigid. Total lung capacity remains constant but vital capacity decreases and residual volume increases. The alveolar surface area decreases by up to 20 percent. Alveoli tend to collapse sooner on expiration. There is an increase in mucus production and a decrease in the activity and number of cilia. The body becomes less efficient in monitoring and controlling breathing (31).

Changes in Gastrointestinal System: There is increased prevalence of atrophic gastritis and achlorhydria. The liver is less efficient in metabolizing drugs and repairing damaged liver cells. Diverticuli in the colon may cause pain. Reduced peristalsis of the colon can increase risk for constipation (32).

Changes in Urinary System: Kidney mass decreases thus reducing the ability to filter and concentrate urine and to clear drugs. With aging, there is a reduced hormonal response (vasopressin) and an impaired ability to conserve salt which may increase risk for dehydration. Bladder capacity decreases and there is an increase in residual urine and frequency. These changes increase the chances of urinary infections, incontinence, and urinary obstruction(33).

Changes in Endocrine System: Insulin resistance may prevent efficient conversion of glucose into energy. A decrease in aldosterone and cortisol may affect immune and cardiovascular function.

Immune System: Age-related changes in the immune (lymphatic) system increase vulnerability to infections, tumors and immune disease. As a result, older adults are at greater risk for infections(32).

Changes in Nervous System: The adult brain retains a remarkable plasticity in its ability to compensate functionally for those losses that do occur. Most neurological declines occur after age 60 and at age 65, less than 2% of senior citizens have cognitive impairment. The incidence of cognitive impairment increases with age so that by age 85, up to 1/3 of older persons have some degree of cognitive impairment.

General Intelligence - In measures of intelligence, older adults display the "classic aging pattern". Performance scores which measure problem solving ability tend to decline with age. Verbal scores which measure learning knowledge such as comprehension, arithmetic, and vocabulary, tend to remain stable. Many of the abilities in which declines occur can be improved through training and practice in memory techniques, problem-solving skills, and other cognitive strategies. Short-term memory loss is common and determining whether "forgetfulness" is benign or a precursor of dementia is often impossible. One aspect of language-- semantic knowledge-- appears to decline with age, although significant differences are not found until beyond 70 years. Semantic knowledge involves word retrieval and is tested by having respondents name common objects (34).

Memory has been more widely studied than almost any other aspect of cognitive function, other than intelligence. Older adults perform less well on tasks involving encoding, retention,

and retrieval of information. As people grow older, the rate at which they process information declines. Information processing has three phases:

- *Encoding*: getting information into the system
- *Storage*: retaining information
- *Retrieval*: recalling information.

Encoding is particularly vulnerable to age. As one ages, it takes more time to encode information than when younger. This slower rate of encoding may be due to changes in vision, hearing and other senses that reduce the efficiency of memory. The slower rate of encoding is most likely the reason for age-related declines in short-term memory. Two types of memory tasks are recall (retrieving information) and recognition (matching information). Regardless of age, recognition is better than recall. Recognition does not decline as we age, but recall does. Long-term memory may decline as we age depending on the extent to difficulty with encoding information. Very long-term memory which spans months or years is relatively stable until well after age 70 (35).

Musculoskeletal System: By age 80, most individuals lose an average of about 2 inches of height. Due to compression of vertebrae, changes in posture, and increased curvature of the hips and knees. There are a number of other changes in the body with aging that affect the bones, muscle, and skin. Bone loss is a universal and inevitable consequence of aging. Osteoporosis has been described as a pediatric disease with geriatric consequences. Women have a more rapid rate of bone loss than men, with the most rapid losses occurring in the 5 years following menopause. Eventually, the bones have the strength of an egg shell and even minor trauma can cause the bone to collapse and fracture. With age, muscles generally decrease in strength, endurance, size and weight. Typically, about 23 percent of musclemass is lost by age 80 as both the number and size of muscle fibers decrease. Much of this decrease

can be prevented by maintaining physical fitness. In addition, older persons gain weight until about age 60, after which it declines. This pattern of weight change is more likely the result of reductions in activity and changes in eating rather than aging itself. Body fat mass can double, lean muscle mass is lost. Degenerative changes occur in many joints and this has practical implications for the clinical management of elderly patients. There is need for rational preventive programs of diet and exercise in an effort to delay or reverse some of these changes(36).

Skin: Wrinkling, pigment alteration and thinning of the skinare age-related changes that reflect the amount of exposure to the sun (i.e., ultraviolet light) more than aging per se. Most of the "aging" of the skin is due to the effects of environment and disease. Two important fibrous proteins-elastin and collagen, determine the elasticity and resiliency of the skin. The skin becomes less able to retain fluids and is more easily dry and cracked. As a result, both the thickness and elasticity of skin decrease. In addition to changes in the skin itself, thesubcutaneous layers of fatty deposits dwindle with age. This gives some very old people an emaciated appearance.

Hair:Men tend to gray earlier and are influenced by heredity and hormones. Older persons have fewer hair follicles on the scalp and the growth rate of hair decreases in the scalp, armpits, and pubic areas However, hair growth actually accelerates and thickens in places like nostrils, ear and eyebrows, especially in men. Older women often have an increase in facial hair as their estrogen levels decrease.

Reproductive System: The most dramatic age-related changes in the reproductive system occur with women at menopause when their estrogen production ceases and they lose their capacity to reproduce. The lower estrogen levels also cause atrophic changes in the uterus and vagina. The uterine lining thins and the elasticity decreases. Vaginal secretions are

reduced. In men, the decline in reproductive ability is more gradual. There is decline in testosterone production, but they maintain their reproductive ability in extreme old age. Erectile dysfunction (impotence) increases with age; about 15% of men age 65 cannot achieve or maintain an erection and it increases to 50% by age 80 (32).

Other physiological changes: Presbyopia, or farsightedness, is caused by the continuous growth of the eyes' lenses and appears to be universal of human aging. Altered hepatic drug metabolism is common in the elderly. Progressive elevation of blood glucose, functional decline in audition, olfaction and vision, poor appetite and reduced appreciation for food manifests because the number of taste buds drops from 245 in young adults to 88 in people aged 74 to 85 years. Enjoyment of eating in the aged is hampered. Edentulous state or ill-fitting dentures can make chewing difficult. The period of swallowing takes 50-100% longer. Impairment of esophageal mobility result in delayed esophageal emptying(37).

2.1.4 Successful aging: Generally, as people get older, they are confronted with multiple losses of health, independence, roles, possessions, friends and family(38). Historically, healthy aging has been conceptualized from a purely medical perspective with the focus being on the absence of disease and disease related disability(39).Health promotion priorities change for individuals and cohorts as they grow older(40). They suggest that the goal of health promotion in the elderly should be to prevent the progression of disease and the management of disabilities with the ultimate aim being to allow older people to maintain their functional independence for as long as possible.

Health is now understood to be more complex than the medical perspective suggests; this is exemplified by the World Health Organization (WHO) declaration that health is defined as "a state of complete physical, mental, and social well-being, and not merely the absence of disease and infirmity" (World Health Organisation,1986). The World Health

Organization Ottawa Charter (1986) (41)defines health promotion as the process of enabling people to increase control over, and to improve their health. Rowe and Kahn's (1997) (42) model of successful aging is consistent with the WHO declaration. It defines successful aging as the avoidance of disease and disease-related disability, the maintenance of high cognitive and physical functional capacity, and an active engagement with life; that is, maintaining physical, mental and social health. Crowther and colleagues (2002)(39) have proposed that healthy aging is also related to a fourth dimension, spiritual health.Therefore, healthpromotion is not just the responsibility of the health sector, but goes beyondhealthy lifestyles to well-being(43).

Physical health: Physical health involves the prevention and control of chronic disease and illness, especially those conditions that are linked with premature death such as coronary heart disease, cancer, respiratory diseases, type 2 diabetes and musculo-skeletal disorders(44). The aging process is accompanied by increased risks of morbidity and mortality and a greater need for health care services(40). Physical health means a lot to older people; this is illustrated by the finding that self-rated health in older people tends to be determined by levels of physical health, and not by the emotional, social and spiritual dimensions of health(45). It is important for older people to maintain their physical health, in particular muscle strength, flexibility, range of motion and sense of balance as the decline in these abilities frequently contributes to falls and functional decline(46).

The importance of physical activity: Healthy lifestyle includes getting plenty of appropriate physical activity, such as simple stretches and walking. Research confirms that physical activity prevents problems as people age such as increased weight gain and risk of cardiovascular disease. Activities that increase strength and mobility can also help older adults remain independent. To stay healthy, older adults also need adequate sleep, sufficient fluid intake, nutritious foods, and a healthy and comfortable body weight **(47)**.

Mental health: Mental health provides individuals with the vitality necessary for active living, to achieve goals and to interact with one another. Mental health is a broad domain of health, encompassing maintenance of psychological and emotional wellbeing as well as the detection and effective management of mental illness(48). Older adults, however, have been suggested to be more vulnerable to mental health problems, particularly depression and anxiety, as they have a lower capacity to deal with the multiple threats to mental health that they face compared to younger, more adaptive cohorts. Such threats to mental health may include the cumulative impact of chronic conditions, loss of status and respect following retirement, lower income, negative community attitudes, loss of spouse, loss of social networks due to decreased mobility, change in residence and/or death(49). The older person's heightened vulnerability to a decline in mental health means that conditions such as depression cause significant and often ongoing disability as well as increased risk of death(50).

Social health: The social environment continues to influence health and well-being throughout life. (51). The social environment is predominantly defined by an individual's socio-economic status; that is, their social network and their financial status, which is determined by their employment history and current income. Social isolation and poor quality social ties are also associated with increased morbidity and mortality, such that isolated

people die at two to three times the rate of people with a network of social relationships and emotional support(52). Social mobilization and the reconnection of older people with their community have been identified as a mechanism for improving overall health and quality of life. Social mobilization can take the form of building social networks, supporting participation in social activities, and fostering a commitment to social support and mutual aid among older people. This is an important process that can not only improve older people's self-esteem and sense of belonging but also helps to overcome negative perceptions of older people that act as a social barrier to participation in the community(53,8).

Spiritual health: The definition of spirituality most frequently used in relation to health promotion is that of positive spirituality,which involves "a developing internalized personal relation with the sacred or transcendent that is not bound by race, ethnicity, economics or class and promotes the wellness and welfare of self and others"(39). Spiritual health is particularly significant for older people as it does not necessarily succumb to the degenerative aging process, even in the presence of debilitating physical and mental illness(54). In fact, while older people are experiencing a decline in physical abilities, it may be possible for them to find inner strength, resources and meaning through their spirituality(38, 54) . Arcury, Quandt and Bell (2001)(9) identified seven domains of health maintenance behaviors that were important to older people, which include eating right; drinking water; exercising; staying busy; being with people; trusting in God and taking care of oneself.

Wellness: Wellness is a broad term that includes not only disease and injury, but also health promotion and disease prevention not only the physical realm, but the emotional, social, intellectual and spiritual domains. Wellness conveys additional important message – that good health is more that physical well-being and that it is more than a response to actual or potential disease or disability Ardell's definition is cited as the most cogent: optimal health

and life satisfaction that includes physical elements (exercise and nutrition), psychological aspects (stress management and emotional intelligence), social and intellectual elements (connectedness significant others and passionate ideas) and spiritual components (seeking meaning and purpose in life (55).

Wellness conveys an important message – that good health is more than physical well-being. In fact, seven dimensions are mentioned among wellness advocates.

i. *Physical* – Exercise, eat a well-balanced diet, get enough sleep, and protect self.
ii. *Emotional* – Express range of feelings, acknowledge stress, and channel positive energy.
iii. *Intellectual* – Embrace lifelong learning, discover new skills, and interests.
iv. *Vocational* - Do something , balance work with leisure time.
v. *Social* – Laugh often, spend time with family, friends, join a club, respect cultural difference.
vi. *Environmental* – Recycle daily, use energy – efficient products walk or cycle, grow a garden(55).
vii. *Spiritual* - Seek meaning and purpose, take time to reflect, connect with the universe.

Palmore (2000) (56)suggests that most of the synonyms for old are unhealthy in some way – words like debilitated, infirm and frail. ‘Older adult’, on the other hand is a more neutral term, and perhaps the term elder connotes an even healthier role for older persons in society.

2.2 HEALTH PROMOTION

2.2.1 Concepts

The term Health Promotion was introduced in the mid -1980’s, in the context of health policy discussion by the World Health Organization(43). Health promotion, targets strengthening of health, by improving conditions of life. The arguments why health

promotion is of great importance or manifold, refers to the individual as well as societal level namely

a) Health is a basic right of (older) people.
b) Health is a one of the most important predictors of life satisfaction in old age.
c) Health is prerequisite for an independent life in old age.
d) Health is vital to maintaining an acceptable quality of life in older individuals and ensuring the continued contribution of older persons to society.
e) Health is a determinant of economic growth and competitiveness. (57)

A healthy population reduces health – care spending and lowers the burden on the health care system (58).There are 16 listed guidelines which are a comprehensive point of reference designed to develop and foster best practice in health promotion for older people(59).

1. *Target group*: Tailoring the health promotion program to the specific needs and individual resources of the relevant target group.
2. *Diversity of target group*: Acknowledging the diversity with the target group, including it in the activities and taking into particular consideration gender, equality and disadvantaged groups.
3. *Involvement of target group*: Actively involving the target group as far as possible and giving older people a voice making them responsible for their own health, social life and active aging.
4. Empowerment of target group: Empowering participants and motivating them to take initiative for their own health and well-being.
5. *Evidence-based practice*: Designing the health promotion project around existing evidence and proven techniques.

6. *Holistic Approach*: Developing multi-faceted, holistic interventions which take into account the physical, mental and social needs of the older person and the inter-relatedness between these needs.
7. *Health strategies and methods*: Employing strategies and methods which are appropriate and reliable to reach the specified target groups and achieve the stated outcomes of the health promotion program.
8. *Setting and accessibility*: Planning the physical and geographical setting where the health promotion program takes place and ensuring ease of access.
9. *Stake holder involvement*: Involving all important stake holders in planning and implementation.
10. *Inter-disciplinarity*: Working towards health promotion with aninter- disciplinary team of professionals with a range of different expertise, experience and means of interacting with older people.
11. *Volunteering*: Involves volunteers in planning, delivery and management of health promotion programs.
12. *Management and financial issues*: Ensuring the effective management of financial efficiency, quality assurance and organizational structure.
13. *Evaluation*: Employing and learning from ongoing, comprehensive and mixed-method evaluations.
14. *Sustainability*: Ensuring the project builds capacity during its life time in terms of finance, participation and human resources, so activities can continue beyond the life time of the project.
15. *Transferability*: Making evident the transferability of certain aspects of the project.
16. *Publicity and dissemination*: Publicizing the activities and accomplishment of the project.

Rodin and Langerin 1977(60)researched among residents in an institutional setting and found that client participation even in mundane choices, can result in better outcomes. The more ambitious the behavior change goal, the more frequent the follow-up contact needs to be(61). From the elders' perspective, empowerment means having the opportunity to learn, discuss, and decide action decisions. Several researchers have presented ideas on how to incorporate health promotion into medical practice. These ideas and practices can be grouped into 4 components and made relevant for older adults.

1. *Leadership*: This needs to inspire elders to accomplish a health goal. Must let them know what is expected.
2. *Goal setting:* This can be done on an individual basis. A practical strategy is to determine a health goal for all elders based on felt needs. The goal should be bound by time, perhaps 6 months to maximize elder energy and asses results.
3. *Intervention*: This has several sub-components. What will be the intervention, who will benefit, how recruitment will be conducted, where the location of intervention will be (best if patient-determined).

Assisting older clients with promoting health and preventing disease is an important component of the health professional's commitment. Andragogy is the art and science of teaching adults based on a different set of assumption about learning.

These assumptions are twofold:

1. *Active involvement:* Active involvement on the part of the older person is preferable to the more traditional passive students' role. Older adults learn best when actively participating in an experience such as helping to set self-goals, individualizing instruction to meet their needs and helping to assess their own progress

2. *Peer interaction*: Andragogy is fostered when age peer provide support, information and assistance to one another. Those programs that allow for peer interaction and support may be more effective than those that rely primarily on didactic educational techniques (62).

McGinnis and colleagues (2002) (63) observe that behavioral pattern are not only the most important contributors to early death but also to quality of life as well. Instead of asking people whether they were ready to make changes leading to weight loss, they should be asked which changes they were most interested in making(64).The health goal most likely to be chosen by older adults when given a choice among many options is the goal of increasing exercise or physical activity(65). Health promotion strategies include the following:

a) Medical screening and immunization
b) Increase in physical activity level
c) Decrease in dietary fat, protein control, increase in vegetable or fruit intake as well as increase in fluid consumption.
d) Initiate a stress management routine.
e) Establish a sleep and hygiene routine.
f) Implement a fall prevention or home safety plan.
g) Join a smoking-cessation program.
h) Enroll in a memory improvement class/ join peer support groups in the area.
i) Implement an alcohol moderation plan (57).

10 Tips for changing health behaviors

1. Discuss the mode of exercise – choose an intervention that an elder enjoys.
2. Modest: ensure the elder establishes a daily modest goal not too difficult and unattainable or vice versa, and short term.

3. Measurable: measurability has several components. How much, how many minutes, how many days, what will be monitored? This also implies record keeping.
4. Memory: what cues need to be established to help remind us of our goals.
5. Positive thoughts: substitute positive and hopeful thoughts for negative, self-defeating ones. Find books or magazines that inspire and encourage.
6. Reinforcement: if success is achieved at the end of the first week, encourage clients to treat themselves to something special. Reinforcements are more effective when they fall in close proximity to the achievement being rewarded.
7. Environmental support: creating a supportive environment to elicit a more favorable response.
8. Stress management: all people feel stressed for various reasons. A favorite technique is deep breathing.
9. Social support: for older adults, social support is desirable, for some, it is essential. A spouse, friend, physician, pastor, neighbor.
10. Problem-solve: it takes multiple efforts to achieve a goal or explore what might have gone wrong. Identify likely barriers and ways to overcome them(57).

2.2.2 Research on health promotion practices among elderly

The purpose of**Resnick**'s study (66) on "Health Promotion Practices of Older Adults" was to describe the primary and secondary health promotion activities of a group of older adults living independently in a continuing -care retirement community. Primary and secondary health promotion activities were described and compared among the young old (age 65 – 80), the old (age 81 - 85), and the old - old (age 86 – 101). Model testing of the factors that influence participation in health-promoting activities was also completed. This descriptive study included 206 of 210 residents who participated in a single face-to-face

interview. The majority of the participants were female (79%), white (99%), and cognitively intact. Those in the old-old age had their stools checked for occult blood; their skin checked for lesions; or a recent mammogram, Pap test, or prostate exam. Model testing found that age, chronic illness, degree of physical and mental health, and cognitive status directly or indirectly influenced older adults' participation in primary and secondary health behaviors.

Harari,(2008) (67) describes a trial using Health risk Appraisal (HRA) to evaluate the effect on health behavior and preventative-care uptake in older people in NHS primary care. An RCT was undertaken in three London primary care group practices. Functionally independent community-dwelling patients older than 65 years (n = 2,503) received a self-administered Health Risk Appraisal for Older Persons (HRA-O) questionnaire leading to computer-generated individualized written feedback to participants and general practitioners (GPs), integrated into practice information-technology (IT) systems. All primary care staff received training in preventative health in older people. The main outcome measures were self-reported health behavior and preventative care uptake at 1-year follow-up. Of 2,503 individuals randomized, 2,006 respondents (80.1%) (intervention n = 940, control n = 1,066) were available for analysis. Intervention group respondents reported slightly higher pneumococcal vaccination uptake and equivocal improvement in physical activity levels compared with controls. No significant differences were observed for any other categories of health behavior or preventative care measures at 1-year follow-up. HRA implemented in this way resulted in minimal improvement of health behavior or uptake of preventative care measures in older people.

Sulander, (2009) (68) reported that in most western societies, socioeconomic position operates as a powerful discriminator of health status and risk of premature mortality. This pattern is visible throughout the life course from young people to the oldest old. Self-rated

health has often been used in studies on health inequalities, and it is recommended as a health measure by the WHO. Associations of poor SRH with morbidity and mortality are well established among people with different ages. The associations have been shown to be maintained even when other health measures such as cardiovascular disease , diabetes, cancer and functional capacity are controlled. Although studies of SRH among older people have gained prominence in recent years, the results lack coherence.

Injury Prevention

Nancye (2006) (69) writes that fall-related hip fractures are one of the most common causes of disability and mortality in older age. The study aimed to quantify the relationship between lifestyle behaviors and the risk of fall-related hip fracture in community-dwelling older people. The purpose was to contribute evidence for the promotion of healthy aging as a population-based intervention for falls injury prevention. A case-control study was conducted with 387 participants, with a case-control ratio of 1:2. Incident cases of fall-related hip fracture in people aged 65 and over were recruited from six hospital sites in Brisbane, Australia, in 2003-04. Community-based controls, matched by age, sex and postcode, were recruited via electoral roll sampling. A questionnaire designed to assess lifestyle risk factors, identified as determinants of healthy aging, was administered at face-to-face interviews. Behavioral factors which had a significant independent protective effect on the risk of hip fracture included never smoking [adjusted odds ratio (AOR): 0.33 (0.12-0.88)], moderate alcohol consumption in mid- and older age [AOR: 0.49 (0.25-0.95)], not losing weight between mid- and older age [AOR: 0.36 (0.20-0.65)], playing sport in older age [AOR: 0.49 (0.29-0.83)] and practising a greater number of preventive medical care [AOR: 0.54 (0.32-0.94)] and self-health behaviors [AOR: 0.56 (0.33-0.94)]. With universal exposures, clear associations and modifiable behavioral factors, this study has contributed evidence to reduce

the major public health burden of fall-related hip fractures using readily implemented population-based healthy aging strategies.

Unintentional injuries were the fifth leading cause of death in the United States in 2006. A number of physical and environmental factors contribute to the greater frequency and severity of injuries from falls among older adults: diminished vision and hearing, poor co-ordination and balance, slower reaction time, arthritis and neurological disease also medication use which increased with age, can produced drowsiness, confusion and depression, increasing the likelihood of accidents. Certain factors are extrusive to the increased incidence of falls among older people; uneven floor surfaces, and absence of safety equipment such as grab bars, hand rails, rugs, inadequate lighting, steep stairs and lack of stairs and ramps. An environmental assessment of old age home of 1000 persons aged 72 and older was conducted showed that the prevalence of environmental hazards was high. Two or more hazards were found in 59% of the bathrooms and in 23% to 42% of the remaining rooms (57).

Vondracek (2009) (70) states that with advancing age, the risk of osteoporosis and bone fracture increases. Case in point—the prevalence of osteoporosis, based on hip bone density, has been estimated at 4% in women 50–59 years of age and 44% in women ≥80 years of age. Hip fractures and their associated costs could double or triple throughout the world by 2040. They add that hip fracture risk rises dramatically with age, with only 50% of people able to return to their pre-fracture movement ability level. Sadly, 20%–40% of patients die within the first year following a hip fracture. The risk of falling increases noticeably with age. About 50% of seniors 85 years of age and older will fall at least once per year. Causes include impaired balance, limited gait and mobility, poor vision, reduced muscle strength, declining

cognition and use of multiple medications. They also note that older seniors tend to fall backward or sideward and are thus unable to catch themselves or break the fall.

Home-based exercise programs result in significant fall reduction and related benefits. One individually tailored exercise program in the home improved physical function, reduced falls, and decreased injuries in a sample of women aged 80 years and older. Over a one-year period, persons in the exercise programs reduced falls by 46% compared with a control that received an equal number of social visits(71).Another home-based exercise program with older adults age 70-84 reported significant fall reduction in comparison to groups that received home hazard management and treatment of poor vision(72).

Not only can starting an exercise program lower an elderly woman's risk of falling, but the benefit can be lasting. Ninety eight women age 75-85 with low bone mass participated in one of three types of groups based exercise programs – strength training, agility exercise, or stretching exercise, and reduced their risk of falls between 37% and 43%(73).

Osteoarthritis: people with osteoarthritis of the knee often experience progressive deterioration in the cartilage. Even a modest amount of exercise – less than 30 minutes a day of moderate activity – appears to prevent disability from arthritis, and those with arthritis show improvement in mobility(74).

Diet

Haveman-Nies(2003) (75) studied dietary and lifestyle factors that contributed to healthy aging. The study population consisted of 1091 men and 1109 women aged 70-75 years from Belgium, France, Denmark, Italy, The Netherlands, Portugal, Spain, Switzerland, and Poland. This European study started with baseline measurements in 1988-1989 and lasted until 30 April 1999. The study included data on diet, lifestyle and health. The study population was

followed for 10 years, and measurements were performed in 1988/1989 (baseline), 1993, and 1999. The relationships of the three lifestyle factors diet, physical activity, and smoking habits to survival and maintenance of health at old age were investigated. Finally it is discussed whether the relationships of healthy lifestyle habits to survival and health contribute to healthy aging. Results indicated that the unhealthy lifestyle habits smoking, having a low-quality diet, and being physically inactive were singly related to an increased mortality risk (hazard ratios ranged from 1.2 to 2.1). In addition, inactive and smoking persons had an increased risk for a decline in health status as compared with active and non-smoking people. The net effect of a healthy lifestyle on the process of healthy aging is likely to go together with a compressed cumulative morbidity. Conclusions denote that a healthy lifestyle at older ages is positively related to a reduced mortality risk and to a delay in the deterioration in health status. This postponement of the onset of major morbidity is likely to go together with a compressed cumulative morbidity. Therefore, health promotion at older ages can contribute to healthy aging.

Puri (2006) (76) writes that nutrition is one of the most important modifiable factors in the development and maintenance of bone mass and quality. The nutrients of most significance to bone health are protein, calcium and phosphorus, important constituents of bone matrix. Dietary components such as magnesium, zinc, copper, iron, fluoride, and vitamins D, A, C and K are required for normal bone metabolism. Food constituents like caffeine, alcohol, and phythoestrogens may impact bone health. There is a consistent positive association between body weight and bone mineral density (BMD). Moderate weight loss of 10% results in 1% - 2% bone loss. High and low protein diets may be detrimental to bone health; hence moderate intake is optimal for bone health. Dietary calcium has a positive effect on BMD. During latter years, calcium and vitamin D, prevents negative calcium balance, thus reducing bone loss. Exposure to sunlight ensures adequate supply of Vitamin D. Magnesium deficiency may be a

risk factor for osteoporosis. Zinc and copper influences collagen maturation. High sodium intake coupled with low calcium low calcium intake can contribute to osteoporosis. Vit A in moderate doses is important in bone modeling process. Vit K supplementation improves bone turn over profile. Vitamin C causes weakening of the collagenous structure in bone. However, dietary fiber found in fruit and vegetables has been associated with decrease in calcium absorption and increased calcium excretion.

Aihara (2011) (77) describes the barriers and catalysts of nutrition literacy among elderly Japanese people (aged ≥ 75 years). A cross -sectional analysis of the responses to a questionnaire administered to 678 study participants (men = 347, women = 331) was conducted. Logistic regression analysis revealed that more men had limited nutrition literacy than did women. After stratification by gender, the limited nutrition literacy group was associated with cognitive difficulty in men and women, visual impairment in men and hearing impairment in women. Lower education level and economic status were associated with limited nutrition literacy among women. Adjusted odds ratios (ORs) controlling for age, education level and economic status, as well as cognitive, visual and hearing function, indicated that informational support [OR = 5.59, 95% confidence interval (95% CI) = 1.28–24.49] and diet/nutrition information obtained from friends of the participants (OR = 2.16, 95% CI = 1.11–4.20) were both associated with adequate nutrition literacy among men, whereas diet/nutrition information from health professionals (OR = 3.96, 95% CI = 1.97–7.95) had a significant relation with adequate nutrition literacy among women. Moreover, in the adequate nutrition literacy group, men were more likely to be overweight (OR = 2.17, 95% CI = 1.20–3.91).

A cross-sectional study of 183 female Bathudis, a tribal population of the Keonjhar District, Orissa, India, was undertaken to investigate age variations in anthropometric and

body composition characteristics and nutritional status. The subjects were categorized into three age groups: < or =30 years, 31-50 years, >50 years. Studies on the nutritional status of these women revealed that with increasing age, there was an increase in the frequency of under nutrition. In conclusion, this study demonstrated that among Bathudi women, age was significantly negatively related with anthropometric and body composition variables and indices. Moreover, with increasing age, the level of under nutrition increased. (78).

Arlappaand colleagues (2005) (79)write about the nutritional status of the tribal elderly in India. A total of 1,239 elderly completed the diet survey (24-hour recall) and 3,932 elderly completed anthropometric measurements. In general, the mean consumption of all the foods and the median intakes of all the nutrients were below the Recommended Dietary Intakes (RDI) in both men and women. The mean heights and weights significantly decreased with increase in age in both males and females ($p < 0.001$). The prevalence of Chronic Energy Deficiency (CED = BMI < 18.5) was relatively higher (65.4%) in females compared with their male counterparts (61.8%). The prevalence of CED was significantly higher ($p < 0.001$) among the elderly living in kutcha and landless households. The tribal elderly are subsisting on inadequate diet, which are reflected in the poor intake of all nutrients and higher prevalence of under nutrition. Significantly higher proportions of tribal elderly are undernourished compared with their rural counterparts ($p < 0.001$).

Exercise

Oida(2003)((80)) identified the effects of regular exercise over 5 years on mortality and ADL impairment were evaluated in elderly people. Design was intervention study in Yamanashi Prefecture, Japan. The subjects were 245 elderly people living at home. Of these

individuals, 155 (56 males aged 76.5 plus or minus 4.2 years at the baseline level; 99 females aged 76.2 plus or minus 4.8 years) who voluntarily participated in the original health-promoting program were regarded as an intervention group. The remaining 90 (29 males aged 77.6 plus or minus 5.2 years at the baseline level; 61 females aged 77.3 plus or minus 5.1 years) were regarded as a control group. The program was a 5-year intervention consisting of collective sessions given six times a year every 2 months. The intervention was a combination of an exercise program based on theories of exercise physiology and a support program based on health education theories. The relative risks of death and ADL impairment adjusted for age, presence or absence of cardiovascular or musculo-skeletal disorders, and functional fitness level at the baseline were calculated using logistic regression analysis. Results suggested that the rates of participant compliance per year were 67.7% in the first year of the intervention period and gradually decreased thereafter to 43.9% in the last year. Amongst female subjects the percentage of those who exercised habitually at the end of the study period was the same as that in the baseline in the intervention group but was significantly lower at the end of the study in the control group (2 = 10.576, P < 0.01). The relative risk of death in the intervention group was 1.0 (95% CI 0.22-4.51) amongst the males and 0.16 (95% CI 0.03-0.81) amongst the females. Relative risk of ADL impairment was 0.22 (95% CI 0.03-1.42) amongst the males and 0.36 (95% CI 0.13-1.02) amongst the females. These findings suggest that the improved mortality and state of independence in the female portion of the intervention group occurred as a result of increased physical exercise levels in daily life. However, validation of the results must await research that employs a randomized control trial to avoid various biases and confounding factors between the intervention and the control groups.

Woo(2007) (81)studied the beneficial role of exercise in improving bone mineral density, muscle strength and balance, which has been documented predominantly in younger

populations. These findings may not apply to elderly populations with limited ability to perform exercises of high intensity. Objectiveof the study was to examine the effects of Tai Chi (TC) and resistance training exercise (RTE) bone mineral density, muscle strength, balance and flexibility in community living elderly people. Randomized Controlled Trial, using blocked randomization with stratification by sex was utilized in a community in Hong Kong, China. One hundred and eighty subjects (90 men, 90 women) aged 65-74, were recruited through advertisements in community centers. Subjects were assigned to participate in TC, RTE three times a week or no intervention (C) for 12 months. Measurements were carried out at baseline, 6 and 12 months. Analyses of covariance (ANCOVA) adjusted for age and baseline values of variables that were significantly different between groups: i.e. smoking and flexibility for men; quadriceps strength for women. Compliance was high (TC 81%, RTE 76%). In women, both TC and RTE groups had less BMD loss at total hip compared with controls. No effect was observed in men. No difference in either balance, flexibility or the number of falls was observed between either intervention or controls after 12 months. The beneficial effects of TC or RTE on musculoskeletal health are modest and may not translate into better clinical outcomes.

The Surgeon General's report on physical activity and health represented a two-year collaborative effort between CDC and the President's Council on Physical Fitness and Sports. It was a comprehensive report on the effects of physical activity on people's health. According to the report, regular exercise and physical activity improved health in a variety of ways, including a reduction in heart disease, diabetes, high blood pressure, colon cancer, depression, anxiety, excess weight, falling, bone thinning, muscle wasting and joint pain. It was noted that 60% of adults did not achieve the recommended amount of physical activity, 25% were not physically achieve at all, 36% engaged in no physical activity – inactivity

increased, with age and was more common among women and people in the lower income. By the age 75, 36% engaged in no physical activity(82).

A study by **Kelly** in 2001 reported that even low-impact aerobic exercise such as brisk walking can increase bone mass. Another study of healthy older persons who engaged in six months of resistance training showed 2% greater bone density in the hip area, and showed signs that bone metabolism had shifted toward generating more bone than was being lost(83).

One study examined the relationship between aerobic fitness and in vivo brain tissue density. High resolution magnetic resonance imaging scans from 55 elder adults revealed that declines in brain tissue densities, as a function of age, were substantially reduced as a function of fitness, even when other relevant variables were statistically controlled(84). In non-demented older adults, a modest amount of exercise as little as 15 minutes, three times weekly is associated with a 32% reduced risk for developing dementia over the next six years(85).

Ceceli E et al (2009) (86) studied whether performing flexibility exercises has any effect on balance and functional ability. The study subjects (primarily women $\geq$65 years of age) included 25 seniors in the flexibility group and 21 subjects in the sedentary control group. Both upper- and lower-body flexibility stretches were performed in a supine position (on a mat), using 10 repetitions of each stretch. All exercises were performed to the subject's endpoint range of motion (i.e., full range of motion). Sessions were held 3 times per week for 20 minutes for a period of 4 months. Balance was tested with a Sharpened Romberg (SR) test and a one-legged stance test. Subjects were allowed to move the arms (for balance) during the sustained testing period (up to 30 seconds). Functional activity was evaluated with a 30-meter walking test and a functional reach test. Anterior trunk flexion and left/right lateral trunk

flexion were also measured before and after training. The study results indicated that flexibility training has a significant positive effect on functional ability and flexibility. In this instance, it is praiseworthy to see a modern, data-based, controlled training study that documents the benefits of full-range-of-motion flexibility training for seniors.

Ferrini and colleagues (1994)(87) examined the association between health beliefs and health behavior (diet, exercise, and an individual's willingness to spend money on 'healthful' items) change in older adults. The study found that respondents who expressed positive beliefs about the behaviors were more likely to report positive changes in health behavior. Generally, those who were more informed about the benefits of health behaviors were found to be more likely to take on those behaviors like avoiding fat eating fiber and losing weight, exercising avoiding sun/ reducing stress and smoking and cancer self-exam.

Sleep

Byles (2003) (88) conducted a study to identify the continuance of sleeping difficulty and medication use in a cohort of older Australian women from baseline to 3-year follow-up and to explore the relationship between these factors and health-related quality of life scores, falls and other health care use. A 3-year longitudinal survey of 10,430 Australian women aged 70-75 years at base-linewere randomly selected from the Australian Medicare database. A majority of women (63%) endorsed one or more items related to sleeping difficulty at 3-year follow-up: 33% reported one item only, 16% reported two or three items, and 14% reported more than three items; 4,194 (42.4%) reporting waking in the early hours,2,592 (26.0%) taking a long time to get to sleep, 2,078 (21.0%) sleeping badly at night,1,072 (10.8%) lying awake most of the night and 1,087 (11.0%) worry keeping you awake. Total scores on the Nottingham Health Profile sleep sub-scale ranged from 0-100 and were skewed to the right. The median score was 12.57. There was a strong statistical association between reporting

sleeping difficulty at baseline and at follow-up. A total of 1,532 (15%) women reported use of sleeping medication at follow-up and women were 6.5 times more likely to report use if they also reported any item of sleep difficulty. There was a moderate level of agreement (88%, =0.56) between taking sleeping medication within 4 weeks before the baseline survey and within 4 weeks before follow-up. On multivariate analysis, sleeping difficulty at baseline was negatively associated with general health perceptions, emotional role limitations and general mental health sub-scales of the Short-Form-36 Health Survey at follow-up; the use of sleep medication at baseline was negatively associated with physical functioning, bodily pain, vitality, social functioning and general mental health Short-Form-36 sub-scale scores. The use of sleep medication was also significantly associated with falls, accidents, and health care utilization. The conclusion is that sleeping difficulty is a common and persistent complaint among older women and is strongly associated with use of sleeping medications. Both behaviors are negatively associated with health status.

Normal aging is accompanied by lessened quantity and quality of sleep. There appears to be a measurable decrease in the ability of the healthy older adult to initiate and maintain sleep, accompanied by a decrease in the proportion of the deeper, more restorative sleep (55).Based on self-reports, chronic primary insomnia in older adults is estimated at 10% with about 50% older adults complaining about sleep problems from time to time. Significant sleep disturbance is likely to impact quality of life. Insomniacs are more likely to be anxious, depressed or forgetful, and may recover more slowly from an illness. Inadequate sleep has also been associated with hypertension(89) and weight gain(90).

A national survey conducted by the National Sleep Foundation reported that 56% of Americans, experienced one or more symptoms of insomnia, including difficulty falling asleep, waking up during the night (91). Forty percent of adults in this survey reported being

so sleepy during the day that it interfered with their daily activities. Yet only 4% were seeing a health care provider for advice or treatment. As we age, sleep efficiency declines from 90% to 70%. Sleep efficiency is the proportion of time spent in bed. There are problems, however, with too little or too much sleep.

Studies by **Gangwisch** and colleagues (2008)(90) suggest that the lowest mortality rate in adults is associated with approximately seven hours of sleep at night and that five or less and nine or more hours of sleep are associated with higher mortality. Sleep hygiene is a major component of most sleep interventions. Attention to the environment is important. Attaining a calm mental state is also important; relaxation techniques can be used to deal with mood, avoid conversation on anxiety-producing topics and avoiding certain foods and drinks after 4 pm.

Mental health

Exercise may be just as effective as anti-depressant medication(92). The conclusions of the **Geogia Centenarian Study**(2007) (55)showed that mental health was more important to survival than the longevity of parents or good habits over the life time. These centenarians were reported to be optimistic, passionately engaged in some activity and had the ability to adapt to repeated losses over time. Conversely, negative attitudes like anger, pessimism and gloomy self-perception of aging can lead to a host of unpleasant consequences. A 30-year follow-up study of 723 patients revealed that those with pessimistic personalities had a 19% increased risk of mortality(93).A 25-year longitudinal study of older adults reported that negative self-perception of aging will diminish life expectancy. The protective effect of a positive a attitude on physical health and mental performance may work in a variety of ways. Positive emotions can increase confidence in performance capacity, strengthen social support,

stimulate motivation for self care and encourage more physical activities that lead to higher level mental and physical functioning(94).

Cognition

Yaffe K et al. 2009(95) looked at cognitive function in a sample population of 2,509 elder men and women (70–79 years of age at the start of the study) over a period of 8 years. The results showed that doing moderate to vigorous exercise, not smoking and volunteering in the community are major predictors of optimal cognitive function. Interestingly, volunteering with older adults has been demonstrated to reduce mortality and increase a person's sense of well-being. The authors affirm that those seniors with positive cognitive function typically do not live alone. Higher levels of educational attainment throughout life are also associated with optimal cognitive function.

Ryberczyk et al(2002)(96)studied older adults with chronic illness and found that 54% of participants in a cognitive behavior programs (group education sessions) and 39% of persons in a home audio relaxation treatment (audiotapes that instructed listeners in muscle, breathing and cognitive relation techniques) significantly improved their sleep efficiency. The authors concluded that older adults with chronic illness are able to make substantial improvements their sleep patterns without resorting to medications.

Positive attitude: A longitudinal study of 23 years duration that studied healthy aging among inner-city men concluded that good mental health with aging, regardless of background involves a capacity for gratitude, forgiveness and love; a desire to connect with people and replenish social networks; an interest in play and creativity; and a commitment to lifelong learning. Older individuals with more positive self-perception of aging lived 7.5 years longer than those with less positive self-perceptions of aging(97). This advantage

remained after controlling for a number of potentially confounding variables. In other words, a positive perception of aging demonstrated a better survival outcome, regardless of whether participants were young-old or old-old, men or women, higher income or lower income, lonely or not, or better or worse off in functional health.

Social

Social support can be defined as the perceived caring, esteem and assistance that people receive from others. Support can come from spouses, family members, friends, neighbors, colleagues, health professionals or pets. There are three basic types:

1. *Emotional support*: providing people with a sense of love, reassurance and belonging.
2. When individuals feel they are being listened to and valued, they develop a consistent relationship with health status.
3. *Instrumental support*: refers to the provision of tangible services that directly assist people who are in need. Examples are financial help and household maintenance. Good instrumental support has been correlated with a decrease in psychosomatic and emotional distress, and with greater life satisfaction.
4. *Informational support*: is the provision of advice, feedback and suggestion to help a person to address problems. Social networks - unlike social support, are defined in terms of structural characteristics: the number of social linkages, the frequency of contacts and so on. Although the characteristics of people's social networks do not correlate with the quality of their social support, they do correlate with positive health

outcomes. A population study of social and productive activities that involved little or no physical activity among older Americans reported that social support is as important as fitness when it comes to affecting mortality (98).

Another study found that older adults who were satisfied with the social support available to them were twice as likely to report better health as those who were not satisfied(99).

Peer support: Growing older presents the challenge of coping with chronic conditions – either their own or those of loved ones. A significant number of these people are discovering the rewards of belonging to a peer support group. Such groups unite people with common concerns so that they can share their ideas and feeling exchange practical information and benefit from knowing that they are not alone. In short, they attempt to help members learn to live as fully as possible, despite the limitations that accrue with age. A peer support group can be organized around a health-promoting theme (e.g. weight reduction, exercise, alcohol restraint, or smoking cessation or it can exist to cope with almost any chronic health condition - Alzheimer's, cancer, arthritis, heart disease, lung disease, stroke, hearing, or visual impairment and others. Besides the obvious mental health focus of peer group, group members typically exchange health-promoting ideas on nutrition, exercise, stress management, smoking cessation and moderating alcohol patterns. Peer support groups have certain commonalities; most operate informally, meet regularly and do not charge fees. Most distribute leadership responsibilities among their peer members, and many involve health professionals in educating members.

Sainsbury(2005)(100)reported that the Barthel Index (BI) has been recommended for the functional assessment of older people but the reliability of the measure for this patient group is uncertain. To investigate this issue a systematic review to identify relevant studies was

undertaken. Studies investigating the reliability of the BI were obtained by searching Medline, Cinahl and Embase. Screening for potentially relevant papers and data extraction of the studies meeting the inclusion criteria were carried out independently by two researchers. The scope of the 12 studies identified included all the common clinical settings relevant to older people. No study investigated test-retest reliability. Inter-rater reliability was reported as 'fair' to 'moderate' agreement for individual BI items, and a high percentage agreement for the total BI score. However, these findings were difficult to interpret as few studies reported the prevalence of the disability categories for the study populations. There may be considerable inter-observer disagreement (95% CI of +/-4 points). There was evidence that the BI might be less reliable in patients with cognitive impairment and when scores obtained by patient interview are compared with patient testing. The role of assessor training and/or guidelines on the reliability of the BI has not been investigated. Although the BI is highly recommended, there remain important uncertainties concerning its reliability when used with older people. Further studies are justified to investigate this issue.

Rout(2006) (101) elaborates on the problems of elderly in rural areas. He opines that rural older people prefer to work as long as they can. Their problems are broadly categorized as follows: their own problems related to themselves, called maladies related to ill-health, ill-stay, ill-adjustments and psycho-social problems, problems due to environment and attitude of family, community, society and agencies of the government. Most rural elderly enjoy good health barring the inevitable age related functional decline, however with increasing age certain problems become frequent viz., immobility, risk of fall, intellectual failure, incontinence of urine, blindness due to cataract, mental health problems which include depression, malnutrition and inability to carry out activities of daily living. Social disabilities in this group include lack of shelter, non-availability of nutrition’s food, lack of emotional and financial security.

Health promotion models and approaches for older people

There are three main approaches towards health promotion: the medical, behavioral and socio-environmental approaches. Each of these approaches has a unique understanding of the origins of health and health behavior and subsequently of their objectives in health promotion. These approaches complement each other well and each one has the capacity to contribute to the development of effective health promotion interventions(102).

Medical approach

Health promotion from this perspective endeavors to understand the epidemiological and biomedical factors related to disease with the objective to eliminate and control disease through screening and treatment. Typical medical interventions may include population wide programs such as immunization, cancer screening, and other opportunistic interventions such as cholesterol or bone density tests(103). Historically, the medical approach has led to a dramatic rise in health standards by controlling the spread of disease. Public health efforts have progressed from this “survival” focus towards a more holistic emphasis on positive wellbeing and lifestyle(39,103). Public health efforts now focus on changing health risk behaviors and constructing an environment that is conducive to health promoting behavior change-that is, eliminating health risk behaviors’ and increasing performance of healthy behaviors.

Behavioral approach

Health promotion from the behavioral approach focuses on implementing interventions to change or remove behavioral health risk factors. Interventions from this perspective target a particular behavioral risk factor associated with a particular negative health outcome(s); they target a population performing the behavioral risk factor and endeavor to promote health through various strategies. These strategies may include raising awareness of health risks through health education, social marketing, and policies that support lifestyle choices. There are a number of theoretical approaches that have been shown to predict and describe health behavior change. Four key models have been identified, these are the health belief model (HBM), theory of planned behavior (TOPB), transtheoretical model (TTM) and the communication enhancement model (CEM). The health belief model is useful to understand the formation of the intention to perform a health behavior; the constructs in the theory of planned behavior have been found to predict performance of a particular behavior; and the stages of change model allows us to understand an individual's readiness to change and the processes and patterns of change(104). The communication enhancement model illustrates the importance of appropriate communication in empowering older people to take ownership over their health. An understanding of each of these models, particularly the processes and patterns of change are important as they allow for the implementation of effective interventions that are relevant to each individual's readiness to change.

Health Belief Model

The health belief model is a motivational model that describes six determinants of health behavior: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, health motivation and cues to action. All six components are regarded as

independent predictors of health behavior. This model hypothesizes that health-related action depends upon the simultaneous occurrence of the following three classes of factors:

a) The existence of sufficient motivation, for example a health concern/scare, to make health issues salient or relevant
b) The belief that one is susceptible to a serious health problem, or the perception of a threat of disease
c) Performing a particular behavior will be beneficial by reducing the threat of disease with few barriers to performing the behavior (105).

Communication Enhancement Model

Bouchard and colleagues (1995)(106) propose the communication enhancement model (CEM) with the objective of empowering older people to improve their health in all possible domains. Benefits of the CEM vary from improving social and mental health by increasing social interaction to improving physical health by enhancing the confidence to be involved in decision making processes about their health. To enhance communication with older people health professionals need to better understand normal aging processes and develop a new cognitive map of the abilities of older people. Health professionals should undertake new roles and use new skills in interacting with, and providing information for older people such that they are enabled and motivated to actively participate in decisions about their health. Older people would benefit if not only health professionals followed these guidelines, but if the general public did as well. Communication enhancement can be achieved through changes in three main areas of intervention:

1. *Self-care*: Older people need to be supported to develop the skills and motivation to ask questions, explore options and make health care decisions. Ultimately, older people need to be assisted to take an active interest in their own health.

2. *Mutual aid*: This is defined as “people’s efforts to deal with their health concerns by working together, helping each other, supporting each other emotionally and sharing ideas, information and experiences”. For example, spousal support, informal networks, support groups, and voluntary organizations can provide mutual aid.
3. *Healthy environments*: This is defined as “altering or adapting our social, economic or physical surroundings in ways that will help not only to preserve but also to enhance our health” (106).

Development of health promotion policy is important as it results in the articulation of principles and goals, and provides a template for reproducing the outcomes of successful programs that have been implemented in the past(107). However, implementation of policy-based state-wide programs is challenging as it demands efficient cross-sector collaboration. Often input is required from local community members as well as housing, urban development, land-use and transportation, industry and agriculture sectors (108).

Conclusion

The new challenge, for public health is to develop a focus on healthy aging. Inadequate resources and attention are focused on health promotion and prevention of disease and secondary disability for older adults, the very population that experiences the highest rates of chronic disease and disability(109).

2.3 QUALITY OF LIFE

2.3.1Concepts

Quality of life is a frequently used phrase, but it lacks a precise and consistent definition. Researchers have addressed this issue and identified a new approach to evaluating quality of life that focuses on a person’s “connectedness” in several domains. This definition

contrasts with the traditional medical model, which presumes that everyone possesses quality of life but it diminishes over the years from disease, disability or other negative conditions. The researchers' suggestion is that quality of life depends on experiencing connectedness in six interrelated domains:

- The metaphysical domain includes self-esteem, self- determination, cognition, purpose, optimism and life satisfaction.
- The spiritual domain includes prayer, worship, fellowship and meaning.
- The biological domain involves functional capacity, physical comfort, health promotion and health maintenance.
- The interpersonal domain includes social support, interpersonal dynamics and cultural dynamics.
- The environmental domain includes socioeconomic status, transportation, assistive devices, safety and aesthetics.
- The societal domain includes one's personal social system and the global societal system (110).

The best way of approaching quality of life measurement is to measure the extent to which people's 'happiness requirements' are met - i.e. those requirements which are a necessary (although not sufficient) condition of anyone's happiness - those 'without which no member of the human race can be happy.' (111).

Quality Of Life is tied to the perception of 'meaning'. The quest for meaning is central to the human condition, and we are brought in touch with a sense of meaning when we reflect on that which we have created, loved, believed in or left as a legacy(112). QOL reflects the difference, the gap, between the hopes and expectations of a person and their present experience. Human adaptation is such that life expectations are usually adjusted so as to lie

within the realm of what the individual perceives to be possible. This enables people who have difficult life circumstances to maintain a reasonable QOL. Other definitions of quality of life include the following (113).

i. The degree to which a person enjoys the important possibilities of his/her life. Possibilities result from the opportunities and limitations each person has in his/her life and reflect the interaction of personal and environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristics.
ii. Three major life domains are identified: Being, Belonging, and Becoming. The conceptualization of Being, Belonging, and Becoming as the domains of quality of life were developed from the insights of various writers.

The **Being** domain includes the basic aspects of "who one is" and has three sub-domains. Physical Being includes aspects of physical health, personal hygiene, nutrition, exercise, grooming, clothing, and physical appearance. Psychological Being includes the person's psychological health and adjustment, cognitions, feelings, and evaluations concerning the self, and self-control. Spiritual Being reflects personal values, personal standards of conduct, and spiritual beliefs which may or may not be associated with organized religions.

Belonging includes the person's fit with his/her environments and also has three sub-domains. Physical Belonging is defined as the connections the person has with his/her physical environments such as home, workplace, neighborhood, school and community. Social Belonging includes links with social environments and includes the sense of acceptance by intimate others, family, friends, co-workers, and neighborhood and community. Community Belonging represents access to resources normally available to

community members, such as adequate income, health and social services, employment, educational and recreational programs, and community activities.

Becoming refers to the purposeful activities carried out to achieve personal goals, hopes, and wishes. *Practical becoming* describes day-to-day actions such as domestic activities, paid work, school or volunteer activities, and seeing to health or social needs. *Leisure becoming* includes activities that promote relaxation and stress reduction. These include card games, neighborhood walks, and family visits, or longer duration activities such as vacations or holidays. *Growth becoming* activities promote the improvement or maintenance of knowledge and skills.

The approach to the measurement of the quality of life derives from the position that there are a number of domains of living. Each domain contributes to one's overall assessment of the quality of life. The domains include family and friends, work, neighborhood (shelter), community, health, education, and spiritual. The City of Vancouver measures QOL using the following indicators: Community Affordability Measure, Quality of Employment Measure, Quality of Housing Measure, Health Community Measure, Community Social Infrastructure, Human Capital Measure, Community Stress Measure, Community Safety Measure, and Community Participation Measure.

UNDP has been publishing the annual Human Development Index (HDI) for countries around the world. It examines the health, education and wealth of each nation's citizens by measuring: life expectancy, educational achievement -- adult literacy plus combined primary, secondary and tertiary enrolment; and standard of living -- real GDP per capita based on PPP exchange rates. - *Human Development Report, UNDP, 1997*

The purpose of the Quality of Life Index (QOLI) is to provide a tool for community development which can be used to monitor key indicators that encompass the social, health, environmental and economic dimensions of the quality of life in the community. The QLI can be used to comment frequently on key issues that affect people and contribute to the public debate about how to improve the quality of life in the community. It is intended to monitor conditions which affect the living and working conditions of people and focus community action on ways to improve health. Indicators for the QOLI include: social, health, economic, and environmental factors.

In quality of life research one often distinguishes between the subjective and objective quality of life. Subjective quality of life is about feeling good and being satisfied with things in general. Objective quality of life is about fulfilling the societal and cultural demands for material wealth, social status and physical well-being. *Quality-of-Life Research Center, Denmark.*

Quality of Life is the product of the interplay among social, health, economic and environmental conditions which affect human and social development - *Ontario Social Development Council, 1997.*

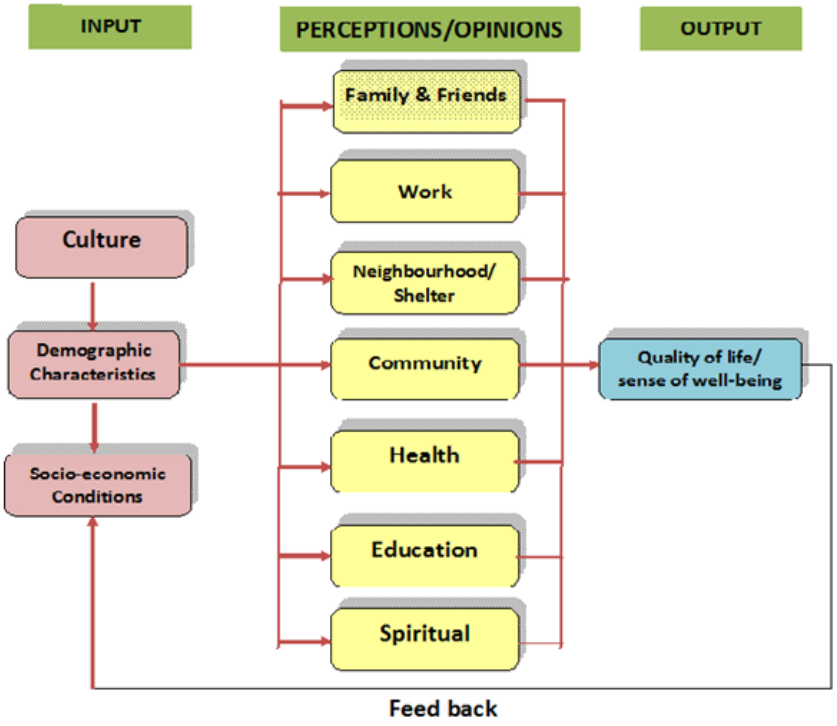


Fig 1 – Quality of life – Systems Model

The approach to the measurement of the quality of life derives from the position that there are a number of domains of living. Each domain contributes to one's overall assessment of the quality of life. The domains include family and friends, work, neighborhood (shelter), community, health, education, and spiritual (Fig 2.1) - *The University of Oklahoma School of Social Work* (113).

2.3.2 Research on Quality of Life among the Elderly

Felcy (1995) (114) explained about a model of quality of life that integrates objective and subjective indicators, a broad range of life domains, and individual values. It takes account of concerns that externally derived norms should not be applied without reference to individual differences. It also allowed for objective comparisons to be made between the situations of particular groups and what is normative. Considerable agreement existed that quality of life is

multidimensional. Coverage may be categorized within five dimensions: physical wellbeing, material wellbeing, social wellbeing, emotional wellbeing, and development and activity.

Cella (1994) (115) writes that after years of second-class status, supportive care is increasingly being recognized for its importance. Included in this recognition is a concern for making more explicit the long-held conviction within medicine that no goal can logically be more important than optimal patient functioning and well-being. This effort to make more explicit the timeless value of medical care has evolved over the past two decades, and come to be labeled “quality of life” research. The usual concern for symptom control, familiar to the palliative-care physician, can conceptually be expanded into a consideration of costs and benefits of various treatment options relative to their subjective perception of personal function and well-being. As our interest turns to the aggressive alleviation of specific (“target”) symptoms, we must critically evaluate the complex relationships among symptom intensity, symptom duration, and overall quality of life.

Thomopoulou (2010) (116) examined the differences at QOL and loneliness between elderly people. Data was collected from 120 males and 60 females aged 60-93 years from Greece. For QOL, males had higher scores(M=20.84,+ - 1.15,p=.05) than females (M= 18.77+ - 1.78,p=.05),old(60-74 years M= 21.03 + -1.44, p=.05) had higher scores than oldest old (>75years M=19.04,+ - 1.55, p= .05) and married subjects had higher scores(M= 20.77,+ - 1.45) than widowed persons (M==18.89,+ -1.72) but with no significance.

Lin (117)compared the efficacy of three programs designed for reducing falls and improving QOL among the elderly; education, home safety assessment and modification, and exercise training. People aged 65 years or older were assigned to one of the three programs. Although all programs appeared to lead to some improvement in QOL, they were significantly greater in the exercise group. QOL benefits reflect not just health states, but also how patients

perceive and value the health and non- health aspects of their conditions before and after receiving an intervention.

This study by **Sudha** and colleagues (2004) (118) examines the pattern of intergenerational familial support among older men and women in South India, indicated by older persons' residence with children vs. with their spouse only or alone, and by any report of receiving financial support from children. Sample size was 1755 elderly persons (664 women and 1091 men) in three states of South India (Kerala, Tamil Nadu and Karnataka). The aim was to examine different models of family support of older persons in Southern India: modernization theory related models; power and bargaining models, and need-based models. Modernization related covariates received limited support in the findings, except with regard to men under some conditions. Among need-based factors, widowhood is the most important trigger of receiving support, among both sexes; poor health or other need-related factors play little role. Strikingly, higher asset ownership is associated with higher likelihood of support, lending support to the power / bargaining model. There are more similarities than differences between the sexes in patterns of covariates.Implications for familial intergenerational support from this study are that modernization factors are not likely to erode familial support for older persons in India. Rather, general poverty or lack of assets is likely to make seniors more vulnerable. If modernization promotes prosperity, it may be associated with better support for older persons in India.

Sonar (2004) (119) The study is based on a sample of the aged above 60 years from couple of villages and old age homes in Gulbarga district of Karnataka. The article probes empirically on socio-cultural, psychological, economic, physical and health aspects of aging and their bearing on intergenerational relations and life satisfaction among the elderly. The study used life satisfaction index-A, semi-structured interview schedule, informal interviews

and case studies. Results showed that the elderly, who are educated, take an active part in family and society and continue to work, have better health and are good to the young. Also, the elderly who own property, get recreation and do not feel isolated/loneliness are found to have good relation with the young. Further, the elderly whose relation is good with different generations are found to have greater life satisfaction.

Morag (1995) (120) The subject of this paper is the definition and measurement of the concept of quality of life, and questions the implementation of quality of life simply in terms of health status measures and scales of functional ability. The study focuses on older people living at home in two contrasting areas of south east England, and demonstrates not only that older people can talk about, and do think about, quality of life, but also highlights how quality of life varies for different age groups of the elderly population living at home, in different geographical areas. In addition, early conclusions also indicate that there is more to quality of life than health: indeed, social contacts appear to be as valued components of a good quality of life as health status. This study deals with issues high on the agenda of the current debate on quality of life and its measurement; it has implications for those involved in both quality of life research and in health and social service policy for older people.

Browne (1994) (121) states that quality of life research with the elderly has usually focused on the impact of decline in function. The questionnaire was administered to 56 healthy elderly community residents at baseline and 12 months later. Quality of life levels were significantly higher at baseline (t=–2.04; p=0.04) than that of a previously studied sample of healthy adults below 65 years of age, and did not change significantly over the study period. The domains nominated by both samples as relevant to their quality of life differed notably. Health status was not correlated with the perceived importance of health at baseline, and

showed only a low correlation (r=0.27) at 12 months. The weight placed on health did not increase over the study period despite a significant decline in health status.

Trentini (2011) (122) opines that there is evidence that subjective health is an important variable in general health outcomes. The aim of the study was to investigate variables associated with subjective perception of health in older inpatients. Ninety elderly inpatients over 60 years old were interviewed. Comparing the group that considered themselves unhealthy to the other group, the former showed a tendency of worse QOL assessments in five out of six domains investigated. Significant differences were found for the physical and level of independence domains, as well as overall QOL. There was a significant association between health perception and lower intensity of depressive symptoms, as well as better QOL perception in the level of independence domain. This study shows the existence of an association between depressive symptoms and health assessment. It also suggests that the independence dimension is important in the elders' perception of their health status.

Van Minh (2011) (123)aimed to assess the subjective quality of life (SQOL) and its correlates among older adults in rural communities of Vietnam and Indonesia. All people aged 50years and over who lived in these two areas were surveyed. Face-to-face household interviews were carried out by trained surveyors using the standardized summary version of the INDEPTH/WHO SAGE questionnaire. In both countries, the SQOL was reported to be higher among (i) men; (ii) people with higher education; (iii) people who were in a marital partnership; (iv) people who lived with other family members; and (v) those with higher economic status, compared with that in those of other categories of the same characteristic. In Vietnam, people who belonged to the second to fifth economic quintiles and had more than 6 years of education were sevenfold more likely to report very good/good quality of life

compared with those who belonged to the first economic quintile (poorest) and had no formal education. The corresponding figure was 2.7 for Indonesia.

Matsuo et al, (2003) (124) examined QOL and personality in 2 groups of elderly subjects with and without activity participation (AP). A survey was conducted in 26 districts with 321 elderly subjects over 65 years of age using a 24-item questionnaire regarding personality and depressive inclination and the visual analogue scale-happiness to measure QOL. The AP group was involved in 5 types of activity: community center activity course, learning and lecture participation, club activity, elderly manpower service activity and other activities. Among the 5 activity types, other activities, characterized as activities adhered to by participants over a long period, showed the highest QOL compared with the 4 other types. In conclusion, the AP of the elderly should be encouraged, and continuing AP might be an important factor in improving QOL of the elderly.

Bowling (2007)(125)and associates conducted an interesting study. The objective was to investigate the apparently incongruous coupling of poor physical functioning with high QOL. Face-to-face interview survey of random sample of 999 people aged 65+ across Britain was done. Twenty-one per cent of respondents reported fairly to very severe levels of functional difficulty, and 62% of these rated their QOL as 'good'. Better self-rated health, lower burden of chronic disease, not having fallen, higher social engagement and higher levels of perceived control over life, distinguished between people who had difficulties with physical functioning and who perceived their QOL to be 'good', rather than 'not good'. The open-ended survey responses broadly supported the quantitative findings.

Kaarlola (2006)(126)undertook a cross-sectional survey to assess mortality, quality of life (QOL), and quality-adjusted life-years (QALYs) for critically ill elderly patients. The study group included 882 elderly patients (≥65 years of age) and 1,827 controls (<65 years of age).

Mortality was assessed during the ICU and hospital stays, and 12, 24, and 36 months after ICU discharge. The cumulative 3-yr mortality rate among the elderly (57%) was higher ($p < .05$) than that among the controls (40%). The majority (66%) of the elderly non survivors died within 1 month after intensive care discharge. QOL was assessed with EQ-5D and RAND-36 measures from 10 months to 7 years after discharge. The majority (88%) of the elderly survivors assessed their present health state as good or satisfactory; 66% found it to be similar or better than 12 months earlier, and 48% similar or better than their preadmission state. QOL measures by RAND-36 revealed that aging decreased their competencies most in physical functioning, physical role limitations, and vitality, but the elderly had better values in mental health than controls. 97% of the elderly survivors lived at home and 88% of them considered their QOL satisfactory or good after hospital discharge.

Conclusion: All the literature points to the fact that active and healthy life styles are well within the reach of everyone, especially the elderly, if there is personal motivation and political will. Although all of us begin aging at birth, both the meaning of aging and those who are identified as elders are determined by society and culture and influenced by history and gender. Health in later life is often thought of in terms of functional ability rather than the absenceofdisease.Wellbeing for older adults is related to functional status, and is also affected by socio-economicfactors, degree of social interaction,marital status and aspects of ones living situation and environment. Good quality of life should be the right of every elder. India will have logistic problems to overcome but we cannot afford to fall short in this regard.

2.4 CONCEPTUAL FRAMEWORK

NURSING THEORY FOR WELLNESS FOCUSED CARE OF OLDER ADULTS

Since its inception in 1980's **Miller's model**(127)has emphasized the significant role of nurses in using health education interventions to promote optimal health, functioning, and

quality of life for older adults. The model is now called the Functional Consequences Theory for Promoting Wellness in Older Adults. The revised model reflects and incorporates the increased understanding of wellness that is evolving as an integral aspect of health care. Nurses can apply this model in any situation where a goal of nursing care is to promote wellness for older adults. The theory was developed to explain questions such as "what is unique about promoting wellness for older adults?" and "How can nurses address unique wellness needs of older adults?"

The Functional Consequences Theory is a middle-range theory based on results of research on aging and health and the author's almost 4 decades of providing nursing care for older adults. It also draws on theories that emphasize concepts related to wellness, health promotion, and holistic nursing. Nurses can use the Functional Consequences Theory as a framework for addressing factors that interfere with health and functioning. Basic premises of this theory are as follows:

- Holistic nursing care addresses the body-mind-spirit interconnectedness of each older adult and recognizes that wellness encompasses more than physiologic functioning.
- Although age-related changes are inevitable, most problems affecting older adults are caused by risk factors.
- Older adults experience positive or negative functional consequences because of a combination of age-related changes and additional risk factors.
- Most functional consequences are negative, but they can be addressed through interventions directed toward alleviating or modifying the effects or risk factors.
- Nurses can promote wellness in older adults through health promotion interventions and other nursing actions that address the negative functional consequences.

- Nursing interventions result in positive functional consequences (also called wellness outcomes) which enable older people to function at their highest level despite the presence of age-related changes and risk factors.

The Functional Consequences Theory draws from theories that are pertinent to aging, older adults, and holistic nursing. The nursing domain concepts of person, environment, health, and nursing are linked together specifically in relation to older adults.

Functional consequences, which are positive or negative, are the observable effects of actions, risk factors, and age-related changes that influence the quality of life or day to day activities of older adults. Actions include, but are not limited to, purposeful interventions initiated by either older adults or nurses and other caregivers. Risk factors can originate in the environment or arise from physiologic and psychosocial influences. Functional consequences are positive when they facilitate the highest level of performance and the least amount of dependency. Conversely, they are negative when they interfere with a person's level of function or quality of life or increase a person's dependency.

Age-Related Changes and Risk Factors

In the Functional Consequences Theory, age-related changes are the inherent physiologic processes that increase the vulnerability of older people to the negative impact of risk factor. From a body-mind-spirit perspective, however, age-related changed are not limited to physiologic aspects, but include potential for increased cognitive, emotional, and spiritual development. Thus, nurses holistically focus on the whole person by identifying age-related changes that can be strengthened to improve the older adult's ability to adapt to physiologic decline.

Risk factors are the conditions that are likely to occur in older adults and have a significant detrimental effect on their health and functioning. Risk factors commonly arise from environments, acute and chronic conditions, psychosocial conditions or adverse medication effects(127).

Nurses incorporate the concept of risk factors in many aspects of the nursing process. A unique aspect of caring for older adults is the need to assess for risk factors associated with myths or ageist attitudes that can affect interventions.

Environmental risks are also particularly pertinent to older adults because additional risk factors, such as sensory, mobility, or cognitive impairments, can compromise their safety and functioning. Risk factors are a major focus of the functional consequences theory because nurses have numerous opportunities for promoting wellness by identifying and addressing the many modifiable factors that affect functioning and quality of life for older adults.

Person

In the Functional Consequences Theory, the concept of person applies specifically to older adults. Because the holistic approach of the theory views each older adult as a complex and unique individual whose functioning and well-being is influenced by many internal and external factors, older adults are not defined simply according to chronologic criteria. From this perspective, an older adult is characterized by the acquisition of physiologic and psychosocial characteristics that are associated with increasing maturity. These characteristics include slowing down of physiologic process, risk factors, and compromised ability are characterized by an increased potential for wisdom, creativity and other psychosocial strengths, and the potential for advanced levels of personal and spiritual growth. In the context of this theory, an individual is an older adult when he or she manifests several or

many functional consequences attributable to age-related changes alone, or to age-related changes in combination with risk factors.

The older adult is further conceptualized in the context of his or her relationship with others because a person is not an isolated entity, but a dynamic being who continually influences and is influenced by the environment and other people. This context is particularly important for older adults because the more functionally impaired a person is, the more important are support resources and environmental factors. When negative functional consequences accumulate to the extent that the older adult is very dependent on others for daily needs, nurses shift their primary focus to working with caregivers to identify and implement interventions. Even for older adults who do not rely on others for assistance, this context is important because older people have a long history of interpersonal relationships that influence their health behaviors and well-being. Thus, nurses assess and address the needs of older adults in the context of their relationships.

Nursing

The conceptualization of nursing in the Functional Consequences Theory draws on many nursing theorists, including the following examples (128,129):

- Florence Nightingale: Nurses foster an environment conducive to healing and health promotion.
- Virginia Henderson: Nurses provide assistance with daily activities to help gain independence as rapidly as possible.
- Modeling and Role-modeling Theory: Nursing is an interactive, interpersonal process that nurtures strengths to achieve a state of perceived holistic health.
- Imogene King: Nurse and client interact to achieve a specific health-related goal.

- Jean Watson: Nursing consists of knowledge, thought, values, philosophy, commitment, and action with passion in human care transactions.
- Martha Rogers: Nurses promote person-environment interactions for unitary human beings
- Margaret Newman: Nursing is the act of assisting people to use their power to evolve toward higher levels of consciousness.

Health

The Functional Consequences Theory defines health as the ability of the older adults to function at their highest capacity, despite the presence of age-related changes and risk factors. It encompasses psychological as well as physiological function, including well-beingand quality of life as defined by each adult. According to this theory, health is individually determined. Some nursing definitions that expand on and support the conceptualization of health in this theory include the following (130, 128):

Florence Nightingale: To be well, but to be able to use well every power we have.

Imogene King: A dynamic life experience involving continuous adjustment to stressors through optimum use of one's resources to achieve maximum potential for daily living.

Calista Roy: A state and process of being and becoming integrated and whole.

Jean Watson: Unity and harmony within the mind, body, and soul; congruence between the self as perceived and the self as experienced.

Margaret Newman: Expanding consciousness; evolving pattern of the whole of life.

Rosemarie Parse: A way of being in the world; the living of day- to –day ways of being.

Madeleine Leininger: A state of well-being that is culturally constituted, defined, valued, and practiced by individuals or groups that enables them to function in their daily lives.

Environment

In the Functional Consequences Theory, environment is a broad concept that includes all aspects of the setting in which the care is provided; for dependent older adults, the environment also includes their caregivers. Some aspects of the conceptualization may seem to be contradictory because the environment can be both a risk factor for negative functional consequences and a source of interventions for positive functional consequences.The following are some definitions of environment from nursing theories that are pertinent to this theory (128):

Florence Nightingale: A healthy environment is essential for healing and includes specific aspects such as noise level, cleanliness, and nutritious food.

Madeleine Leininger: The totality of an event, situation, or particular experience that gives meaning to human expressions, interpretations, and social interactions in particular physical, ecologic, sociopolitical, and cultural settings.

Imogene King: The background for human interactions, which is both internal and external to the individual.

Margaret Newman: All internal and external factors of influence that surround the client or system.

Calista Roy: All conditions, circumstances, and influences that surround and affect the development and behavior of humans.

Applying the theory to promote wellness in older adults in the context of the Functional Consequences Theory, nurses direct their care toward minimizing the effects of negative functional consequences and promoting wellness outcomes for older adults. The focus and goals of this type of care varies in different settings. For acute care, the focus is on treatment of pathologic conditions that create serious risk. Goals include helping vulnerable older adults recover from illness and maintain or improve their level of functioning. For long-term care, the focus is on addressing multiple risk factors that interfere with functional abilities; goals include improved functioning and quality of life. For home and community settings, the focus is on short and long term interventions aimed at age-related changes and risk factors; goals include improving or preventing declines in functioning and addressing quality of life concerns. In all settings, nurses can incorporate wellness outcomes to address each older adult's personal aspirations toward well-being of body, mind, and spirit.

A major focus of nursing care is on educating older adults and the caregivers of dependent older adults about interventions that will eliminate risk factors or minimize their effects. The educational aspects are particularly important when myths and misunderstandings contribute to negative functional consequences. For example, nurses can provide information about age-related changes and risk factors to an older person who believes that functional impairments are a necessary consequence of old age and identify ways of minimizing the effects of risk factors and compensating for the effects of age-related changes.

After extensive reference where the investigator studied all the available models and theories, this recent model put forward by Miller in 2009, with minor modifications,appeared most appropriate to the current study.Her familiarity with the nursing process to assess age-related changes and risk factors, identify nursing diagnoses, plan wellness outcomes,

implement nursing interventions to address negative functional consequences and evaluate the effectiveness or outcome of the intervention lent the needed conviction to utilize this theory.Providing nursing care for the older adult comes with its own stereotype attitudes and challenges, but she believed in their potential for achieving higher levels of physiological, psychological and spiritual functioning especially when the intervention was in their natural surroundings. She worked to incorporate wellness outcomes to address each older adult's aspirations for well-being of body, mind and spirit.

The first component of the Functional Consequences Theory for promoting wellness in older adults is **Nursing Assessment**. In the study this involved gathering information about demographic and socio- economic characteristics which included age, sex, religion, education, marital status, financial stability, sources of income, occupational status(past and present), relationship to care giver, personal habits of smoking, alcohol and any other habit, dietary preference and co-morbidities.

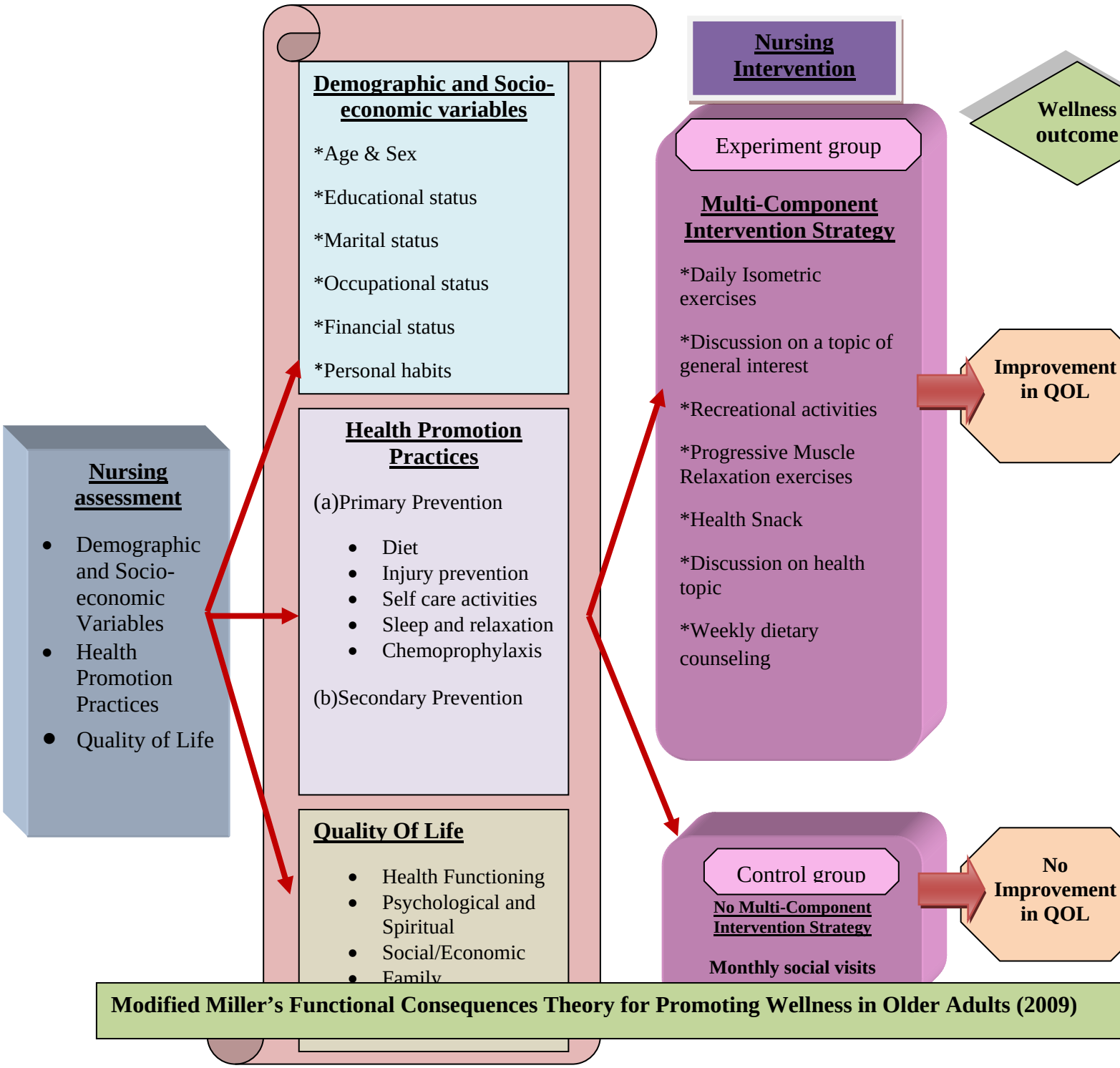
The second aspect that was assessed was the health promotion practices in the elderly. This included information regarding health behaviors under primary and secondary prevention. Diet, exercise, injury prevention including safe home environment, self- care activities, sleep and relaxation, and chemoprophylaxis were studied under primary prevention, while attendance at medical camps, compliance with prescribed drugs, going for follow-ups, having follow-up investigations and ability to discuss health problems with family were included in secondary prevention.

The third aspect that was assessed was the quality of life of the elderly which included four domains viz.health and functioning, social and economic, psychological/spiritual, and family.

The second component of the model is**Nursing Interventions** which in this study included the multi-component intervention which was conducted for subjects in the experiment group. These involved isometric exercises, recreational indoor and outdoor activities, discussions on a general topic of interest, health snack and progressive muscle relaxation exercises on a daily basis, along with weekly dietary and health counseling. The control group did not receive the multi-component intervention.Monthly social visits were made to this group

The last component of the model evaluates **Wellness Outcomes**. The study measuredthe quality of life in the experiment and control groups after the multi- component intervention.The wellness outcome in the experiment group was hypothesized to show an improvement in quality of life, while there would be no improvement in the control group.

The wellness outcomes that were not directly measured, but were expected to impact the experiment group were improvement in health promotion practices,increase in health awareness,positive functional consequences (increased safety and functioning, and sense of wellbeing and self-worth), decrease in negative functional consequences and empowerment to take responsibility for own health. None of these aspects were expected to demonstrate any change in the control group, along with the possibility of increase in vulnerability to risk factors.



CHAPTER 3

METHODOLOGY

The study aimed at identifying the existing health promotion practices among the rural elderly and to evaluate the efficacy of a multi- component intervention strategy on the quality of life among the same group. This chapter describes the process undertaken by the investigator to find answers to the research problem.

3.1. RESEARCH DESIGN

The research approach used was quantitative and the design selected for this study is community randomized trial (CRT). A CRT is a type of randomized control trial (RCT), in which intact social units or clusters of individuals, rather than individuals themselves are randomized to different intervention groups. This is sometimes more appropriate to randomize clusters of individuals to different arms of the study. This is also known as group randomization trials, and is particularly utilized extensively in the evaluation of non-therapeutic interventions, including lifestyle modifications, educational programs and innovations in the provision of health care (131).

In most RCT's individual participants are randomly allocated to treatment arms. These are "individually randomized trials". In some trials however, groups of individuals may be randomly allocated to treatment arms. These groups are referred to as clusters and such trials are known as cluster randomized trials. Depending on the definition of a cluster, there are a number of alternative terms for such trials- common are group randomized trials and community randomized trials. The term 'community' however, is sometimes ambiguous since it does not distinguish between individual randomized trials carried out in the community and trials in which community are randomized to treatment arms. CRT's measure the population- level effects of intervention delivered to groups of individuals. RCT's are the gold standard for evaluating the effects of interventions to improve health and they have come to play a central role in evidence- based medicine. RCT's rest on three key features:

1. The interventions or treatment conditions are allocated to participants by the investigator. This means it is possible to assemble treatment groups that are comparable in every aspect other than the treatment condition.
2. There should be a control group which is followed up in parallel to the intervention group using similar methods, so that outcomes can be compared between these groups over the same period of time.
3. Randomization is used to allocate participants to the treatment conditions under comparison. This is an objective, fair and transparent procedure and if implemented correctly with an adequate sample size, should ensure that the treatment groups are comparable with respect to all characteristics apart from the treatment condition under study. Importantly, this includes potential confounding factors, even those that are unknown and immeasurable. This is a very significant strength of randomized study design (132).

The reasons for adopting a community randomization design rests on considerations that are related to ethical issues, the desire to contain costs or attempts to minimize experimental contamination. The trade-off between lower precision associated with cluster randomization and the potential contamination bias associated with individual randomization is a factor that frequently influences the decision to adopt a cluster randomization design. The threat of contamination may be further minimized by implementing the study in a geographic area in which distinct and well separated clusters of subjects are recruited. The communities could be close enough to permit monitoring and intervention by the investigator, but not so close that educational activities in the interventional village would affect the control community. Groups rather than individuals are more likely to be compliant, since all subjects are assigned to same intervention (131).

The main reasons for the investigator adopting a community randomized design for this study were:

1. The intervention by its nature had to be applied to an entire community or other grouping of individuals, as it was more convenient and acceptable to apply it this way.
2. To avoid contamination that might have resulted if individuals in the same community were to be randomized to different treatment arms.
3. To capture the population-level effects of an intervention applied to a large proportion of the population.
4. To avoid ethical, logistical and methodical problems that might otherwise have arisen.

Community randomization made it easier because the intervention was made widely available and socially acceptable to all in the community. In this study, the villages were randomized into experiment and control groups, and the multi-component intervention strategy was administered to the experiment group. The CONSORT Statement was included to improve the reporting of a randomized controlled trial (RCT), enabling readers to understand a trial's design, conduct, analysis and interpretation, and to assess the validity of its results. It emphasizes that this can only be achieved through complete transparency from authors (133). A descriptive component was utilized for collecting information about the existing health promotion practices among the rural elderly.

3.2. SETTING

Vellore District is one of the 32 districts in the state of Tamilnadu. Each district is divided into Blocks for village administrative purposes. Vellore is divided into 22 such Blocks. Geographic and logistic convenience was the reason to select Kaniyambadi Block of Vellore District which comprises of 84 villages that are covered under community health and

development (CHAD) program of CMC, Vellore. The Government has provided 3 primary health centers, 17 health sub- centers and 85 integrated child development services. CHAD has provided 5 Public Health Nurses who cover 15000-20000 population each and 17 Health Aids who cover 5000-7000 population each. In addition, there are 6 male extension workers who organize medical camps and other programs and 51 part time volunteers who cover 1000 population each. The 6 villages selected for the study were:

Experiment Group

1. **Mottupalayam:** This village is 23 km. from Vellore and has a total land area of 225.48 hectares. The main occupation of the people is agriculture. There are facilities like a primary school, market, bank, cooperative store, small public library and a few private practitioners. Transport facilities include a town bus that runs through the village four times a day. There are no local medical facilities and the people utilize CHAD, which is 5 km away, for their health needs.
2. **Thuthipet:** This village is situated 11 km from Vellore and covers an area of 218 hectares. The main occupation of the people is agriculture. Facilities like primary school, local market, library building, and government cooperative store exist. There are no local medical facilities and the people make use of CHAD, CMC for their health needs.
3. **Salamanatham:** Located 27 km from Vellore, this small village covers an area of 156 hectares. The older people are mostly agriculturalists while the younger men work in the Indian army. The village has similar public facilities like a primary school, local market and cooperative store. Public transport is by town bus which plies twice a day. The people utilize the Vellore Government hospital for their health needs.

Control Group

1. **Munjurpet**: This village is situated 11 km from Vellore and is spread over an area of 1114.40 hectares. The main occupation of the people is brick making. There is a local market, bank, government cooperative store and middle school. Transport facilities are more frequent because of its proximity to Vellore. Medical needs are met by private medical practitioners.
2. **Nanjagundapuram**: Located 23 km from Vellore this village is difficult to access due to the foot- hill terrain. Facilities are minimal. It covers an area of 512.08 hectares. The major occupation of the people is agriculture, with the young men joining the army. There is primary school, a cooperative store, and local market. Bus services are very infrequent and unreliable. Many use the bullock cart as a regular mode of transport. Those who can afford to, travel by vans. The people utilize the Vellore Government hospital or CHAD, for their health needs.
3. **Keelarasambut**: Tucked away in the foot hills of the Amrithi range of hills, this small village covers 171.89 km and is difficult to access because of poor roads. There is a school building but no teachers are posted. A local produce weekly market supplies the needs of the people. Cattle rearing and agriculture are the main occupations. The people utilize the Vellore Government hospital or CHAD, for their health needs.

3.3. POPULATION

The study population consisted of all elderly men and women in the age group 60 years and above. The Kaniyambadi Block has a total population of 1,09,744 (CHAD Statistics 2011-12).

Table 3.1 Total population of the study villages

Name of village	Population	Elder Population	Percent (%)
Mottupalayam	0934	149	16.0
Thuthipet	1376	168	12.2
Salamanatham	1374	198	14.4
Munjurpet	5420	671	12.4
Nanjagundapuram	3678	483	13.1
Keelarasambut	2254	311	13.8

3.4.SAMPLE

A large sample of elders was willing to participate in the study. However, due to logistic reasons of distance to the study center and multiple family reasons, a total of 162 elders from the six cluster randomized villages who consented to participate in the study were recruited.

3.5. SAMPLE SIZE CALCULATION

The sample size was calculated using Two Proportion Hypothesis Testing-Large Proportion-Equal Allocation Formula using Good QOL among the elderly as outcome.

Hypothesis testing of two large proportions-equal allocations

Assumptions

- The outcome variable measure should be binary (success/failure, alive/dead)
- The sampling distribution of the sample proportion is approximated to be normal.

Formula

$$H_o : P_1 = P_2; \qquad H_a : P_1 \neq P_2$$

$$n = \frac{\left\{ Z_{1-\frac{\alpha}{2}} \sqrt{2\,\bar{P}\,(1-\bar{P})} + Z_{1-\beta} \sqrt{P_1\,(1-P_1) + P_2\,(1-P_2)} \right\}^2}{(P_1 - P_2)^2}$$

Where,

$$\bar{P} = \frac{P_1 + P_2}{2}$$

P_1 : Proportion in the first group

P_2 : Proportion in the second group

α : Significance level

$1-\beta$: Power

The percentage of expected QOL at the baseline is nearly 25%. After the intervention, the change in QOL is expected to increase by 25 to 30% (difference in post QOL – pre QOL). Keeping α and β errors at 5% and 10% respectively, the sample size needed for an anticipated change of 25% is 77 subjects in each arm and for a change of 30% is 54 subjects in each arm. It was decided to study 65 subjects in each arm. However, the final sample size was 146 elders in the experiment (73) and control (73) groups, because all elders who fulfilled the inclusion criteria were included (Total Enumeration). This is explained by the Consort diagram in Fig.1.

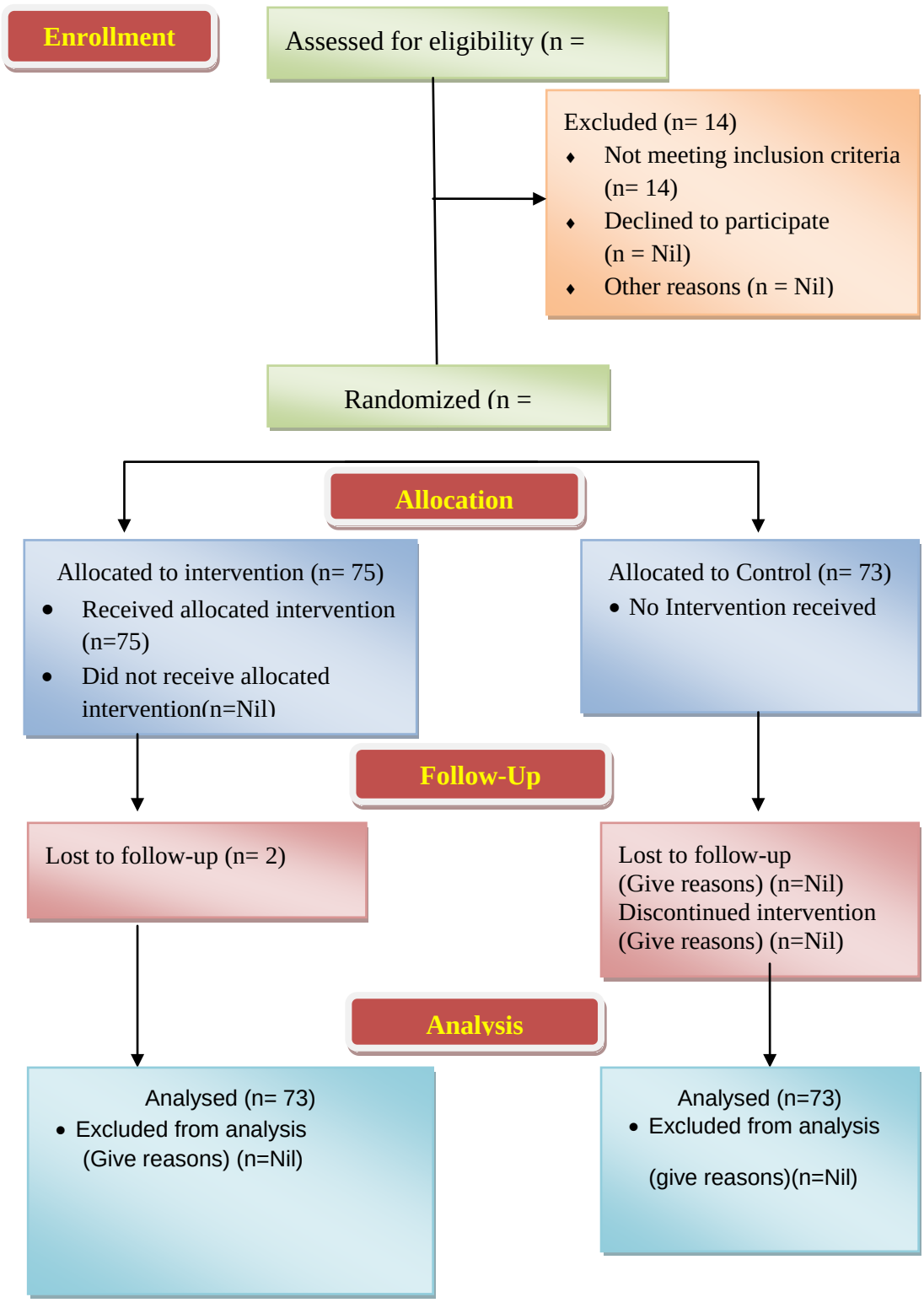


Figure 3: CONSORT 2010 Flow Diagram for subjects

3.6. CRITERIA FOR SAMPLE SELECTION

A. VillageInclusion Criteria

1. Permission from CHAD, CMC.
2. Permission from village authorities.
3. Availability of a designated room with electricity for the MCI to be conducted.
4. Water and toilet facilities nearby.
5. Availability of a local village volunteer.

B. Village Exclusion Criteria

1. Disinterest / refusal by the village authorities for the study to be conducted.
2. Coercion from village authorities to conduct the MCI for a particular caste of people.
3. If the experiment and control villages were less than 5 km apart.

C. Individual Inclusion Criteria

1. Informed consent to participate in the study.
2. Age 60 years and above.
3. Resident in the village for minimum period of 2 years.
4. Above 85 score on Barthel's ADL index.

D. Individual Exclusion Criteria

1. Those that are mentally unstable become critically ill or die during the study period.
2. Those likely to leave the village intermittently during study period.
3. Those with irregular attendance at the study center for more than 4 occasions every month, as ascertained from the attendance register.

3.7.METHOD OF SAMPLE SELECTION

A total of 11 villages in Kaniyambadi Block were identified who fulfilled the inclusion criteria. These villages were surveyed, after permission from the village authorities was obtained. The availability of a regular designated meeting place (study center) with electricity, water and toilet facilities was ensured. The total number of available subjects was ascertained from the CHAD in-charge Public Health Nurse, specific village Public Health Nurses and Health Aids and checked against available computerized data at CHAD. The names of 11 villages were written on pieces of paper and placed in a box. Using lottery method, 6 villages were selected. The first 3 villages were allocated to experiment group and the last 3 were allocated to the control group. An arbitrary distance of 5 km between the group villages was maintained in order to decrease 'casual contamination'. Once the villages were randomized, all the elderly who consented to participate in the study and fulfilled the inclusion criteria were recruited, by utilizing Total Enumeration Sample Selection method. The Barthel's Index was scored on all the subjects by the investigator before they were registered for the study.

The Barthel's Index(100) is an activity score which measures the capability of an individual to perform the activities of daily living such as feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfers (bed to chair and back), mobility on level surfaces, usage of stairs, etc. It also grades the person's capability as unable to perform, needs help and total independence to perform the ADL. Asking the person, friends and relatives are the usual sources, but direct observation and common sense are also utilized. Direct testing is not needed.

Table 3.2 Sample size in experiment and control villages

Experiment villages:	Mottupalayam	26 subjects
	Thuthipet	21 subjects
	Salamanatham	28 subjects
Total		75 subjects (2 lost to follow-up) **= 73 subjects**
Control villages	Munjurpet	28 subjects
	Nanjagundapuram	22 subjects
	Keelarasambut	23 subjects
Total		**73 subjects**

3.8. DATA COLLECTION INSTRUMENTS

3.8.1. DEVELOPMENT OF THE INSTRUMENT

To identify the health promotion practices and evaluate the quality of life of the rural elderly before and after a multi-component intervention strategy, a multi-dimensional approach was utilized. Data collection instruments included questionnaires for health promotion practices and quality of life. The multi –component intervention strategy was administered to the subjects in the experiment group.

3.8.2. DESCRIPTION OF INSTRUMENT

Part I: Demographic and socio-economic variables(Appendix 4)

This consisted of demographic and socio-economic characteristics of age, sex, religion, educational status, past occupational status, present occupational status, and financial stability, source of income, marital status, and relationship to care-giver, personal habits, dietary preference, BMI and existing co-morbidities. It was administered by the investigator.\

Part II: Health promotion practice questionnaire (Appendix 5)

This investigator-developed 37 item questionnaire included health behaviors under primary and secondary disease prevention and healthy living, which was rated on a 4-point scale.

Primary prevention: Diet (5 items), exercise (4 items), injury prevention (home safety 4 items + injury prevention 5 items) self-care activities (4 items), sleep and relaxation (5 items) and chemoprophylaxis (4 items).

Secondary Prevention: Attendance at medical camps, adherence to medication, follow-up visits and investigations and assistance of family to access health care and discussion of health problems with family (6 items). The questionnaire was administered by the investigator.

Part III: Ferrans' and Powers' Quality of Life Index – Generic version III (Appendix 6)

The Ferrans and Powers Quality of Life Index (QLI) (134) was developed using a solid conceptual and methodological basis, which explains its broad recognition as an instrument for evaluation of the quality of life, in many countries. One feature that differentiates this instrument from the other refers to its peculiar structure: in addition to evaluating the level of satisfaction regarding its several items, it also includes an evaluation of the degree of importance assigned to them, taking into account that people may value differently the many aspects of life. The instrument includes representative dimensions of the construct it intends to measure, with items formulated in a simple and comprehensible way

which avoid making the respondents tired or unmotivated, especially in cases of individuals who are frail, of old age or with low educational level (135).

This standardized questionnaire consists of 2 parts with the same 33 items in each part. The items are broadly categorized into the following four domains:

Health and functioning	-	13 items (1-7, 11, 16-18, 25, &26.)
Social and economic	-	8 items (13, 15, 19- 21/22, 23 &24.)
Psychological/spiritual	-	7 items (27- 33.)
Family	-	6 items (8- 12 &14.)

Part 1: How **'satisfied'** in that domain of life

Part2: How '**important'** is that domain of life.

Each item of the first part of the instrument (Satisfaction) corresponds to the same in the second (Importance).

Responses were rated on a scale from 1 – 6.

It was administered by the investigator pre and post MCI.

Part IV: Multi-Component Intervention Strategy (Appendices 7**-13, 30-33)**

Independent nursing interventions were carried out from Monday to Saturday between 9.30 am to 12.30 pm, every week for six months. They included:

- Daily isometric exercise schedule as per recommendation of Age –Care India (1999).
- Daily social interaction between the elderly where one topic of general interest would be discussed.
- Daily recreational activities involving playing of indoor and outdoor games:

Indoor – Brainvita, ‘Daayam’, Snakes & Ladders, and Ludo

Outdoor – Simple ball games

- Daily consumption of locally prepared health snack and drink
- Daily progressive muscle relaxation exercises according to Jacobson (1963)
- Weekly discussion on health related topics
- Weekly dietary counseling using South Indian Rural Food Guide Pyramid for elderly as recommended by the Dietary Department, CMC, Vellore.
- Nutritional assessment of anthropometric measures of height and weight from which BMI was calculated at the beginning before the MCI and after 6 months, at the end of the study.

3.8.3. SCORING AND INTERPRETATION

Part I:Demographic and socio-economic variables:

No scoring was allotted for the demographic and socio-economic data.

The data was used for descriptive analysis where simple percentages were calculated.

Part II:Health Promotion Practice Questionnaire

The primary and secondary health behaviors were rated on a scale of 0 – 4 where

0 = Not at all

1 = Sometimes

2 = Many times

3 = Most of the time

4 = All the time

Summated scoring was done for the primary and secondary health behaviors and tertiles were calculated to categorize the responses as follows:

Table 3.3Categorization of HPP scores

HEALTH PROMOTION PRACTICES	POOR	MODERATE	GOOD
Diet	<9	9.1-11	>11.1
Exercise	<2	2.1-4	>4.1
Injury prevention	<10	10.1-13	>13.1
Self -care activities	<13	13.1-16	>16.1
Sleep	<9	9.1-11	>11.1
Chemoprophylaxis	<5	5.1-6	>6.1
Secondary prevention	<5	5.1-8	>8.1

Reverse scoring was done for the following items in the questionnaire:

Item 1. - Diet: c & e

Item 3. - Injury prevention: e & f

Item 5. - Sleep and relaxation: b & c

Item 6. - Secondary prevention: c

Part III: Ferrans' and Powers' Quality of Life Index – Generic Version III

Responses to **Part 1 and 2** of the questionnaire were rated on a scale of 1-6 where:

1 = Very dissatisfied / very unimportant

2 = Moderately dissatisfied / moderately unimportant

3 = Slightly dissatisfied / slightly unimportant

4 = Slightly satisfied / slightly important

5 = Moderately satisfied / moderately important

6 = Very satisfied / very important

The 33 items are distributed into the four dimensions (subscales): health and functioning (13 items), social and economic (8 items), psychological/spiritual (7 items) and family (6 items) (MiakoKimira) (136). It should be noted that items 21 (job) and 22 (not having a job) in the social and economic domain are mutually excluding, that is, only one of them is to be considered when calculating the scores. To determine the scores, each satisfaction item is weighted by its corresponding importance item. Hence, the values are combined, i.e., highest scores represent high satisfaction and high importance, and the lowest scores represent low satisfaction and high importance. This scoring scheme is based on the belief that people highly satisfied with areas of life they consider important have abetter quality of life than those who are unsatisfied with areas they consider important (134,137).

Table 3.4 Description of QLI Scoring

S. No.	Steps	Description
1.	Recode satisfaction scores	To center the scale on zero, subtract 3.5 from satisfaction response for each item. (This will produce responses of –2.5, -1.5, -.5, +.5, +1.5, +2.5.)
2.	Weight satisfaction responses with the paired importance responses.	Multiply the recoded satisfaction response by the raw importance response for each pair of satisfaction and importance items.
3.	Obtain preliminary sum for the overall (total) score.	Add together the weighted responses obtained in step 2 for all of the items.
4.	Obtain final overall	To prevent bias due to missing data, divide each sum

	(total) QLI score.	obtained in step 3 by the number of items answered by that individual. (At this point the possible range for scores is –15 to +15.) Next, to eliminate negative numbers for the final score, add 15 to every score. This will produce the final overall (total) QLI score. (Possible range for the final scores = 0 to 30).

QLI = [SAT rec. x IMP for each item/no. of answered items] +15

Where SAT rec. = recoded value for each satisfaction item (-2.5 to +2.5)

IMP = raw value for each importance item (1-6)

The mean scores between the range of 0 -30 were taken to categorize the Overall Quality of Life as Poor (0-15) and Good (16-30)

Part IV– Multi -Component Intervention Strategy

No scoring was carried out on the components of the MCI except body mass index (BMI), which was calculated from height and weight that was measured once at the beginning before the MCI was administered and once after 6 months, at the end of the study.

<18.5 = Under- weight

18.51-24.9 = Normal weight

>25.0 = Over-weight

3.8.4. VALIDITY AND RELIABILITY

All tools were translated to the local language of Tamil and back-translated to English, to ensure content validity.

Part II - HPP Questionnaire was developed under expert guidance of specialists in the field of Nursing, Geriatric Medicine, Dietetics and Community Medicine, who also validated the instrument.

Coefficient of Variation among the experts who validated the tools:

Coefficient of Variation (CV) = (SD/Mean) x100

CV = (2.38/55.2)x100

CV = 4.3 (Found to be good)

P value = <0.001 was taken as highly significant and P=<0.05 as significant

Part III -Ferrans' and Powers' Quality of Life Index – Generic Version III

Validity

Content validity of the QLI was supported by the fact that items were based on extensive literature review and reports of patients regarding the quality of their lives (134).

Reliability was analyzed by means of the internal consistency for the QLI (total scale) by using Crohnbach's α and ranged from 0.73 to 0.99 across 48 studies. Crohnbach's α for the four subscales have been published in 24 studies and ranged from 0.70 to 0.94. The value obtained were 0.93 for all items. The convergent validity was assessed by the correlation between the score of a question on overall satisfaction with life and the total score. The correlation coefficient for the instrument as a whole was 0.77 (138).

3.9. PILOT STUDY

A pilot study was conducted for the experiment and control groups between July and December 2010, to check feasibility of study and test reliability of the instruments. Two villages were randomized into experiment and control villages and ten subjects in each village were included. No changes were made in any of the instruments except minor

grammatical corrections for better clarity. The MCI was administered to subjects in the experiment village for a period of 6 months. QOL questionnaire was administered to subjects in both groups before and after the MCI. After the pilot study, it was found feasible to conduct community randomized trial.

3.10. DATA COLLECTION

Discussions were held with the CHAD consultant in-charge of community programs, CHAD in-charge Public Health Nurse, the other village Public Health Nurses and village Health Aid and permission obtained. Eleven such villages were identified that fulfilled the village inclusion criteria. Key decision makers in the villages were identified to determine their level of interest in participating in the trial. Initial surveys were conducted in the selected villages, and the elderly persons were identified. Permission was obtained from the village authorities to conduct the study and they were assured that there were no potential hazards or risks to the elderly. The selected worksites were inspected to ensure that they met the several conditions prior to being randomized. The names of 11 villages were written on pieces of paper and placed in a box. Using lottery method, 6 villages were selected. The first 3 villages were allocated to experiment group and the last 3 were allocated to the control group. An arbitrary distance of 5 km between the group villages was maintained in order to decrease ‘casual contamination’.The CONSORTillustration Fig.3 explains the process.

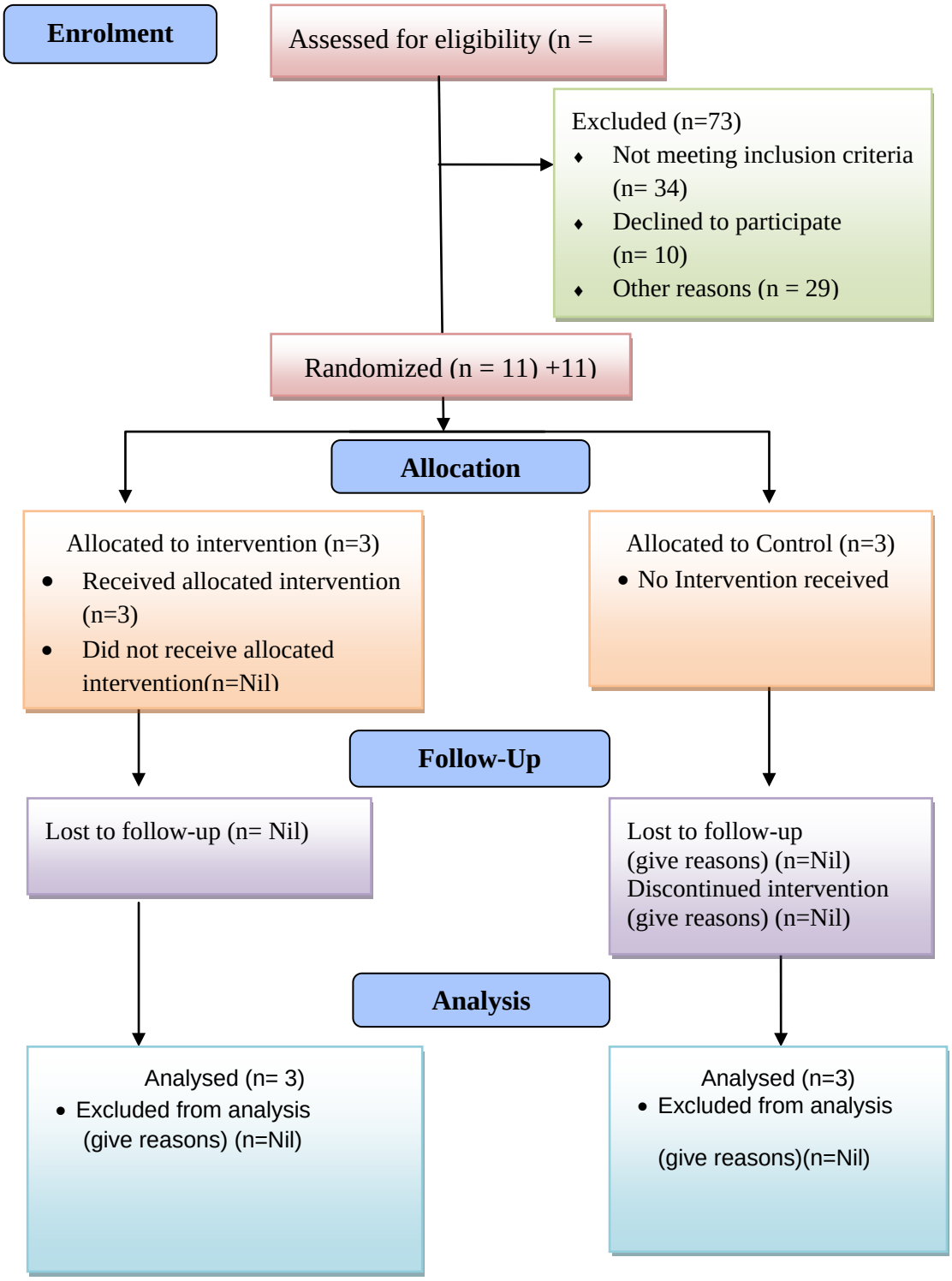


Figure 4 CONSORT 2010 Flow Diagram for villages

The investigator developed a good rapport with the subjects in the experiment and control villages and gave them all details relating to the study. The Barthel's score was assessed by the investigator and elders who measured 85 on the Barthel's score were recruited for the study. All data was collected from each subject individually in a comfortable and private spot nearby, away from the group, so as to minimize any external influence. Demographic and socio-economic data was collected on the first day and the HPP and QOL (Part 1 and 2) questionnaires were administered on the second day, before the MCI was administered (pre). The MCI was initiated soon after, to ensure that baseline assessment accurately described subjects prior to their receiving the MCI. It also protected against possible decline of interest and consequent risk of loss- to- follow-up. However, randomized assignment of the villages into experiment and control groups, conducted simultaneously, placed predictable demands on the investigator while data was collected. The same QOL questionnaire (Part 1 and 2) was administered to both groups again at the end of 6 months (Post).

The experiment group elders were administered the MCI by a local volunteer in each village who was selected, trained and personally instructed on every aspect of the strategy by the investigator. The MCI was carried out from Monday to Saturday between 9.30 am – 12.30 pm, every week, for 6 months. The volunteer would teach and supervise the elders while they performed the isometric and relaxation exercises and while playing the indoor and outdoor games. She would initiate general topic discussions among the subjects, who actively participated in the discussions and were very willing to share their life stories. The investigator monitored the study centers in order to identify any difficulties in implementing the intervention and assess the quality of data. She visited each of the six villages twice in the first month to administer the HPP and QOL questionnaires and twice in the and last month to administer the QOL questionnaire (Part 1 and 2), and spend time with the elders to

facilitate termination of the study. In between she also visited each village once every month to ensure that the MCI was being conducted in the experiment villages and checked the availability of the subjects in the control villages. During her visits to the study centers in the experiment villages, for three hours in the morning, the investigator supervised the subjects performing the isometric and relaxation exercises, and playing indoor and outdoor games. She gave dietary counseling on one topic and also instructed the subjects on a health related topic. During the visits to the control villages the investigator had an informal social interaction with the subjects. Anthropometric measures of height and weight were checked and BMI was calculated for subjects in both experiment and control subjects before the MCI was administered. Investigator visited the experiment village volunteers, once every month in the evenings to encourage and reinforce the MCI. They needed to be updated on what and how to conduct general discussion sessions and on some simple health topics. She supplied them necessary printed resource material for the same which were prepared by the investigator.

3.11. DATA ANALYSIS

This study was undertaken with the initial component of assessing the prevalence of health promotion practices among the rural elderly, by utilizing a descriptive design. An experiment design conforming to a community randomized trial was undertaken to study the efficacy of a multi-component intervention strategy on the quality of life among subjects in the experiment and control groups, before and after the intervention. Information about demographic and socio- economic characteristics was collected to provide an overall description of the subjects. Simple percentages were used to describe these findings. All the other data was analyzed according the objectives of the study as follows:

1. Prevalence of HPP among rural elderly was calculated using simple statistical measure of percentages.
2. QOL among the rural elderly was calculated using percentages, chi square, and 'p' value 0.001 and above was identified as highly significant and 0.05 was significant.
3. Efficacy of MCI on QOL in experiment and control groups (pre & post intervention) were calculated using mean, standard deviation, mean difference,' t'-test for equality of means, degree of freedom and confidence interval at 95 % . 'p' value of 0.001 and above was identified as highly significant and 0.05 was significant.
4. The association between HPP & QOL was analyzed using percentages and chi-square. 'p' value 0.001 and above was identified as highly significant and 0.05 was significant.
5. Association between HPP and QOL with selected demographic and socio- economic variables was calculated using percentages and chi-square. 'p' value 0.001 and above was identified as highly significant and 0.05 was significant.

3.12. ETHICAL CONSIDERATIONS

The pilot study and the main study were conducted after approval by the Ph.D. Advisory Committee. Ethical clearance was obtained from the Institution Review Board (Appendix-1)and from the Nursing Research and Ethical Committee of the College of Nursing (Appendix-2). Permission was obtained from the Head of Community Health Nursing and the Head of CHAD. Discussions were held with the village authorities and permission was obtained.

An elder information sheet (Appendix-14) was prepared and translated into the local language of Tamil. Doubts of the family and the subject were clarified and written consent

(Appendix-15) was obtained from the subjects. Those who could not sign provided their thumb impression. It was ensured that the study centers were kept clean and safe at all times. Subjects were carefully supervised, while performing the exercises and during outdoor games. No risks were encountered. Local snacks that the elders were used to, were served. Confidentiality of the participants and data was ensured at all times.

CHAPTER 4

RESULTS

This chapter presents the findings of the study in relation to prevalence of health promotion practices among rural elderly and efficacy of a multi-component intervention strategy on the quality of life between experiment and control group.

Data was collected among 146 subjects in six villages. There were 75 subjects recruited in the experiment group, of which two were lost to follow up. Thus, findings from 73 subjects in the experiment group and 73 subjects in control group were included for the final analysis. Results were summarized, compared, tested and inferences drawn according to the objectives and hypothesis. All data were entered in Microsoft Excel Spreadsheet and a master sheet was prepared. Analysis of the data was done through an integrated computer program known as Statistical Package for Social Sciences Version 16 (SPSS 16).

Demographic and socio-economic data obtained were tabulated for experiment and control groups and the total was summarized in percentages. Descriptive and inferential statistics were used to analyze the data. Chi-square was done for comparison between the groups in relation to quality of life. 't' test and confidence interval at 95% were used to denote the change in pre and post interventions, QOL within the experiment and control groups as well as between the two groups. Association between HPP and baseline QOL & HPP and QOL with selected demographic variables was analyzed using percentages and Chi-square. '*p*' value calculation in the analysis was set as of $p< 0.05$ as significant while $p< 0.001$ was taken as highly significant. Data is presented in tables and figures.

4.1. ORGANIZATION OF THE FINDINGS

The data analysis and findings are presented under the following sections.

Section 1 – Demographic and socio-economic characteristics

Table 4.1: Demographic and socio-economic characteristics of experiment and control group.

Figs 6-12: Distribution of subjects based on demographic and socio-economic characteristics.

Section 2 – Prevalence of HPP

Table 4.2.1: Prevalence of HPP among the rural elderly

Figure 13: Overall distribution of subjects based on HPP

Section 3 – Quality of Life

Table 4.3.1: Quality of life among the experiment and control group

Table 4.3.2: Percentage improvement of the overall QOL in the good category of the experiment group

Section 4 – Efficacy of MCI on QOL

Table 4.4.1: Change in the QOL within experiment and control group pre and post intervention

Table 4.4.2: Efficacy of MCI on QOL within experiment and control group

Section 5 – Association between HPP & baseline QOL

Table 4.5.1: Association of HPP and QOL domain of health and functioning.

Table 4: 5.2: Association of HPP and QOL in social/economic domain

Table 4.5.3: Association of HPP and QOL in psychological and spiritual domain

Table 4.5.4: Association of HPP and QOL domain of family

Section 6 – Association of HPP with selected demographic and socio- economic variables

Table 4.6.1: Association of diet with selected demographic and socio-economic variables:

Table 4.6.2: Association of exercise with selected demographic and socio-economic variables

Table 4.6.3: Association of injury prevention with selected demographic andsocio-economic variables

Table 4.6.4: Association of self-care activities with selected demographic and socio-economic variables

Table 4.6.5: Association of sleep and relaxation with selected demographic and socio-economic variables

Table 4.6.6: Association of chemoprophylaxis with selected demographic and socio-economic variables

Table 4.6.7: Association of secondary prevention with selected demographic and socio-economic variables.

Section 7 - Association of QOL with selected demographic and socio- economic variables

Table 4.7.1: Health and functioning domain with selected demographic and socio-economic variables.

Table 4.7.2: Social / Economic domain with selected demographic and socio-economic variables.

Table 4.7.3: Psychological and spiritual domain with selected demographic and socio-economic variables.

Table 4.7.4: Family domain with selected demographic and socio-economic variables.

SECTION 1

Demographic and socio-economic characteristics of the rural elderly

The demographic and socio-economic characteristics included in the study were age, sex, education, marital status, occupational status, financial stability, relationship to care giver, personal habits of smoking, alcohol and other habits, dietary preferences and existing co-morbidity. Among a total of 146 participants, 73 were in the experiment group and 73 in the control group. Descriptive statistics of percentages were used. The data is presented in tables. Education, relationship to caregiver, personal habits of smoking, alcohol and other habits, and co-morbidities, pre and post intervention, BMI are depicted in figures 5 – 11 in this section.

Table 4.1: Demographic and socio-economic characteristics of experiment and control group

S.No.	VARIABLES	EXPERIMENT N=73		CONTROL N=73		TOTAL N = 146	
		No.	%	No.	%	No.	%
1.	**Age** (years)						
	60 - 65	15	20.5	10	13.7	25	17.1
	>65	58	79.5	63	86.3	121	82.9
2.	**Sex**						
	Male	31	42.5	30	41.1	61	41.8
	Female	42	57.5	43	58.9	85	58.2
3.	**Religion**						
	Hindu	69	94.5	70	95.9	139	95.2
	Christian	-	-	3	4.1	3	2.1
	Muslim	4	5.5	-	-	4	2.7
4.	**Past Occupational Status**						
	Gainfully employed	47	64.4	43	58.9	90	61.6
	Not gainfully employed	26	35.6	30	41.1	56	38.4
5.	**Present Occupational Status**						
	Agricultural worker	14	19.2	19	26.0	33	22.6
	Building worker	-	-	6	8.2	6	4.1
	Casual laborer	12	16.4	10	13.7	22	15.1
	Domestic helper	1	1.4	2	2.7	3	2.1
	Others	15	20.4	10	13.7	25	17.1
	Not working	31	42.5	26	35.6	57	39.0

Contd.

S.No.	VARIABLES	EXPERIMENT N=73		CONTROL N=73		TOTAL N = 146	
		No.	%	No.	%	No.	%
6.	**FinancialStability**						
	Independent	1	1.4	4	5.5	5	3.4
	Partially dependent	32	43.8	31	42.5	63	43.2
	Fully dependent	40	54.8	38	52.0	78	53.4
7.	**Source of Income**						
	Old age pension	50	68.5	56	76.7	106	72.6
	Military pension	18	24.7	15	20.5	33	22.6
	Daily income	1	1.4	2	2.7	3	2.1
	Monthly Income	4	5.5	-	-	4	2.7
8.	**Marital Status**						
	Married	40	54.8	55	75.3	95	65.1
	Widow/ Widower	31	42.5	17	23.3	48	32.9
	Separated	2	2.7	1	1.4	3	2.1
9.	**Dietary Preference**						
	Vegetarian	41	56.2	29	39.7	70	48
	Non-Vegetarian	32	43.8	44	60.3	76	52.1

Table 4.1 shows that there were more subjects belonging to the age group >65 yrs in both the experiment (79.5%) and the control (86.3%) group. Females were more in number both in the experiment (57.5%) and control (58.9%) group. Majority of the subjects were Hindus in both the experiment (94.5%) and control (95.9%) group. Most of the subjects have been gainfully employed in both the experiment (47%) and control (43%) group. Most were employed in both groups and a few of them were not so, in the experiment (42.5%) and control (35.6%) group. About half the subjects were fully dependent financially in both the experiment (54.8%) and control (52.0%) group. The table shows in many ways how the subjects in both the experiment as well as the control group were balanced and almost equalized.

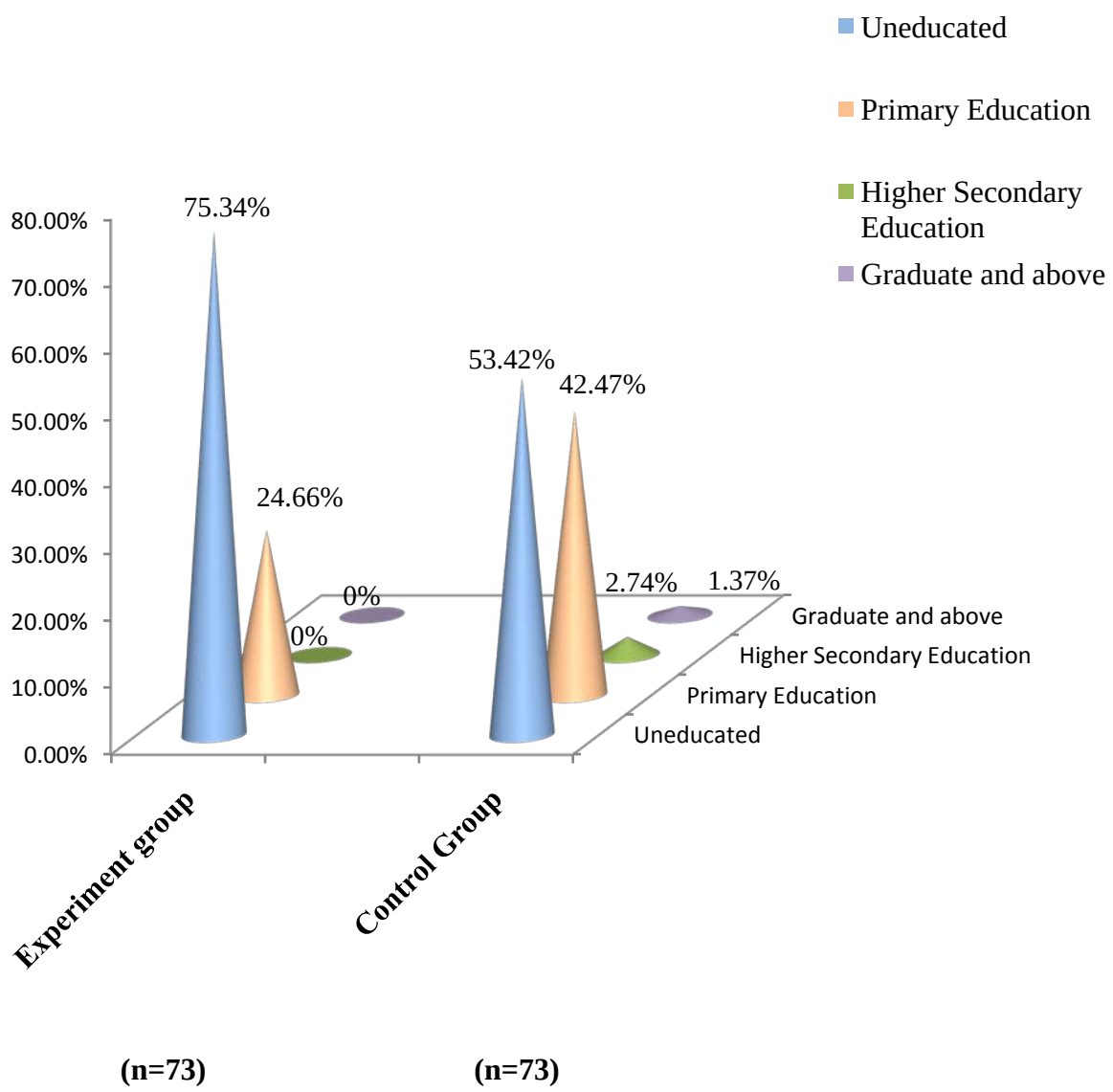


Figure 5: Distribution of subjects based on education

Figure 5 shows that 75.34% of the subjects in the experiment group and 53.42% in the control were uneducated. There were no subjects in the experiment group who had higher secondary or graduate education while in the control group a small percentage of 2.74% were educated till higher secondary level and 1.37% was graduate.

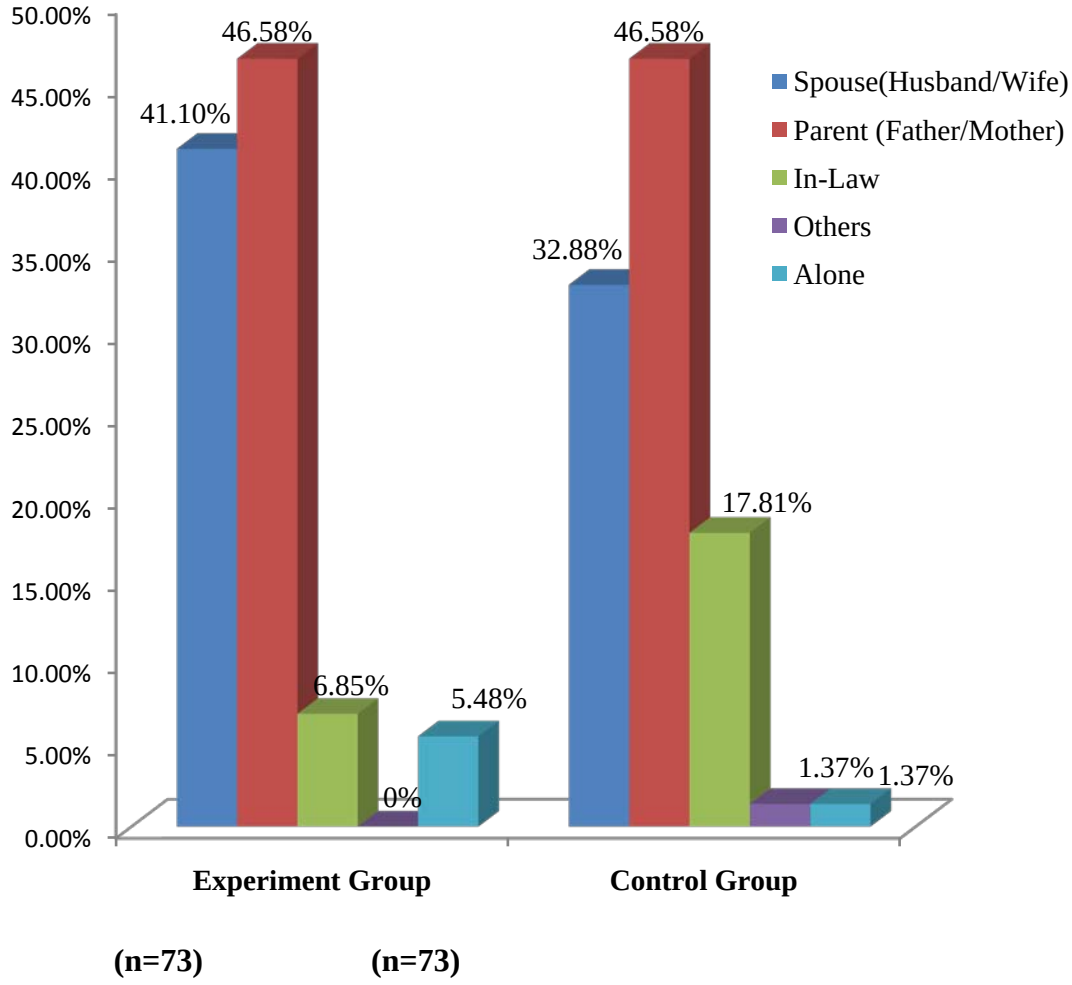


Figure 6: Distribution of subjects based on relationship to caregiver

Figure 6 demonstrates that 41.1% of subjects in the experiment group and 32.88% in the control group lived with their spouses while an equal number in both groups (46.58%) lived with their children.

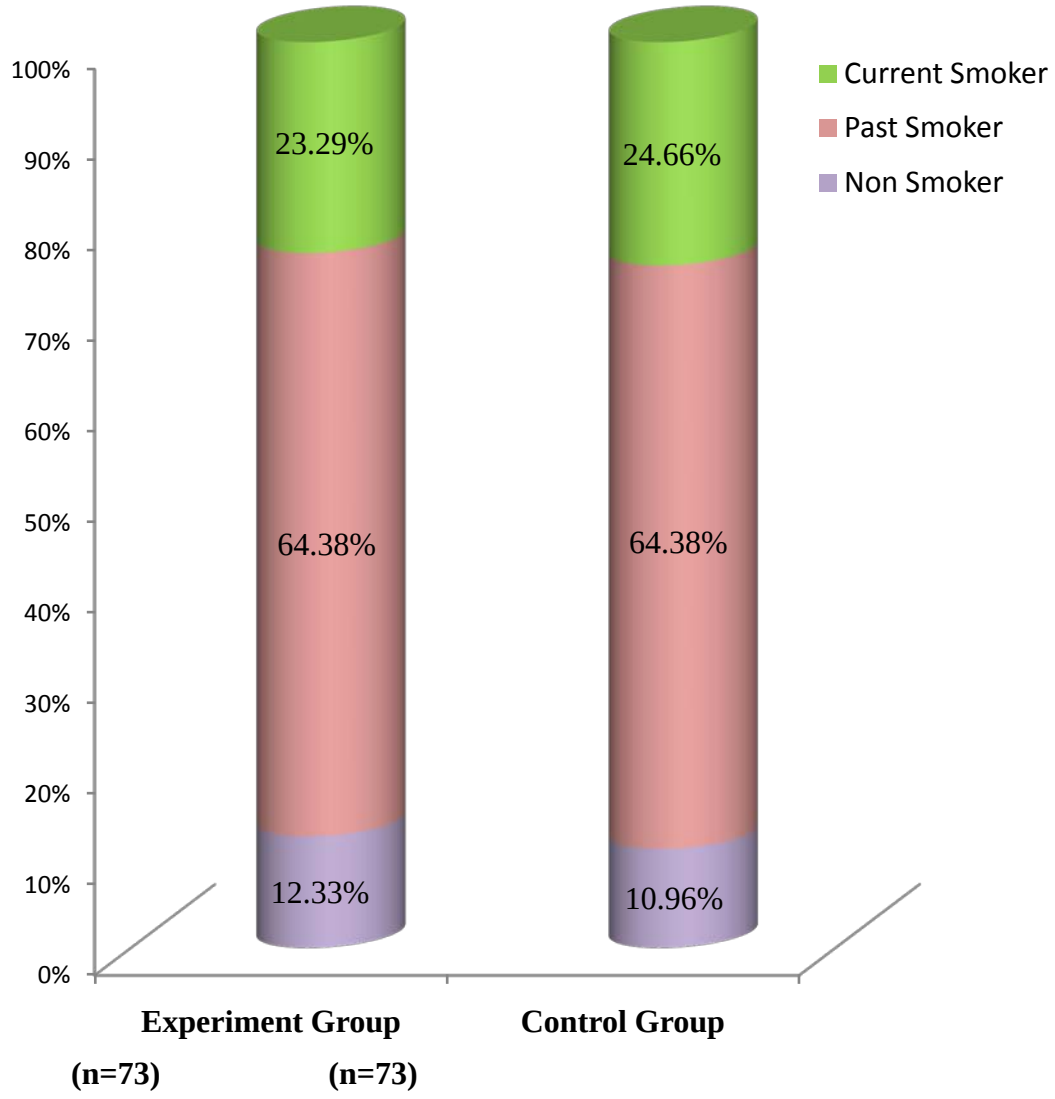


Figure 7: Distribution of subjects based on personal habit of smoking

Figure 7 explains that in experiment and control groups, the number of subjects who are current smokers were almost similar (23.29% and 24.66% respectively). Past smokers were equal at 64.38% in both groups while non-smokers were 12.33% and 10.96% in the experiment and control groups respectively.

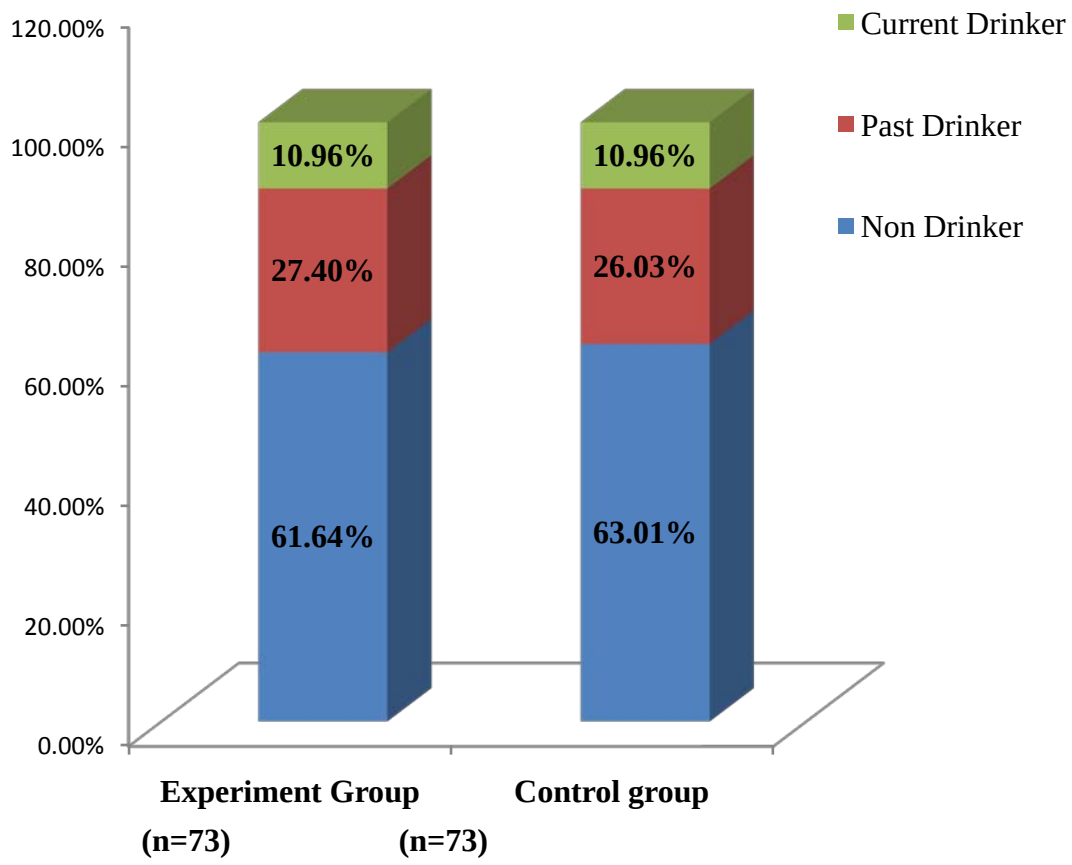


Figure 8: Distribution of subjects based on personal habit of alcohol intake

Figure 8 demonstrates that large percentages were non-drinkers in the experiment and control groups, 61.64% and 63.01% respectively. Current drinkers were found to be the same, 10.96% in both groups.

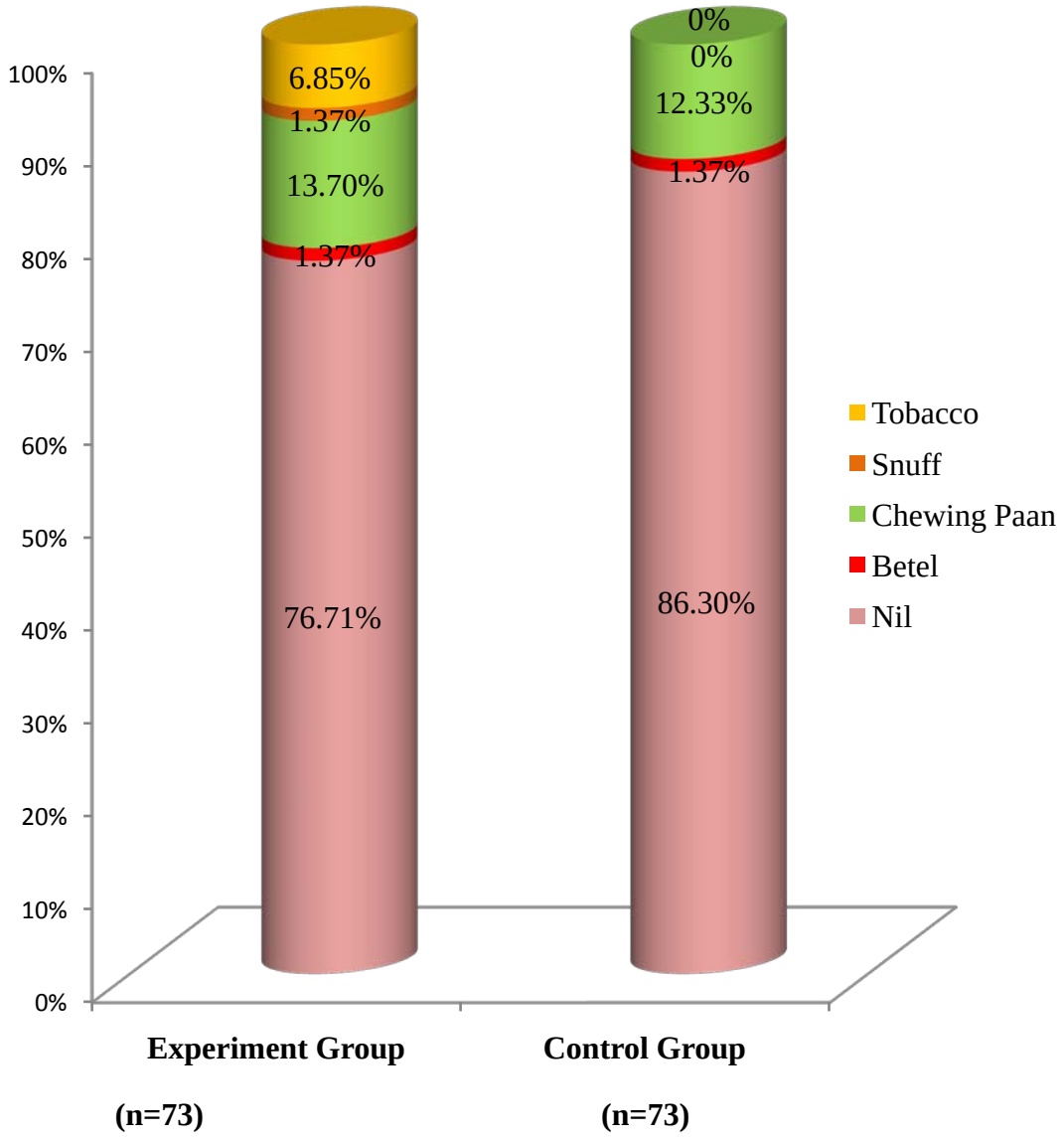


Figure 9: Distribution of subjects based on other personal habits

Figure 9 denotes that 1.37% in experiment and control groups chewed betel, 13.70% in experiment and 12.33% in control group chewed paan, and 6.85% in experiment group chewed tobacco.

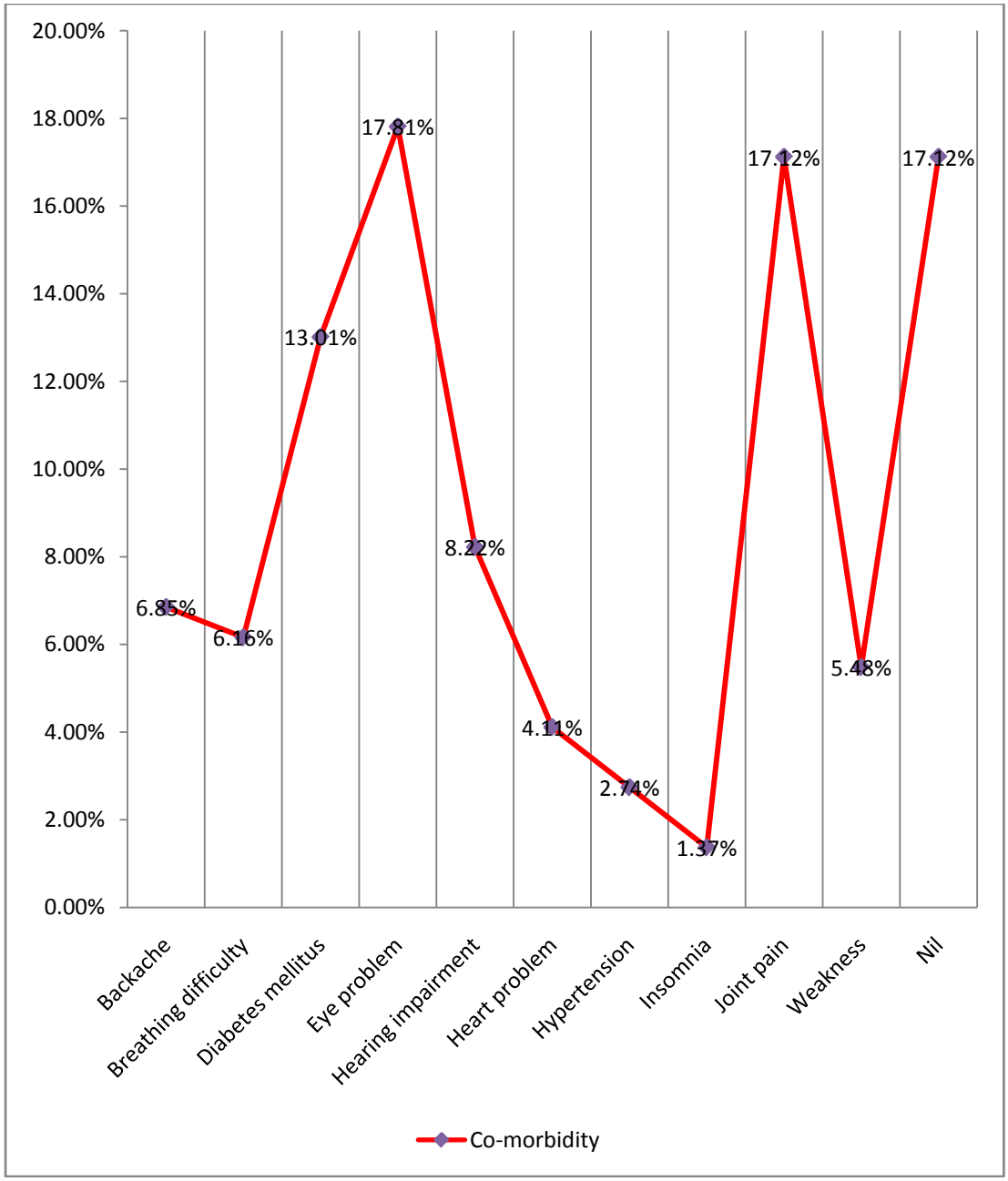


Figure 10: Distribution of subjects based on co-morbidity

Figure 10 demonstrates that 17.12% of the subjects did not have any co-morbidity, while all the rest had some type of co-morbidities. The highest percentage of subjects had eye problems 17.81%, while 17.12% had joint pains and 8.22% had hearing impairment. Diabetes mellitus was present in 13.01% of the subjects and 4.11% had heart problems.

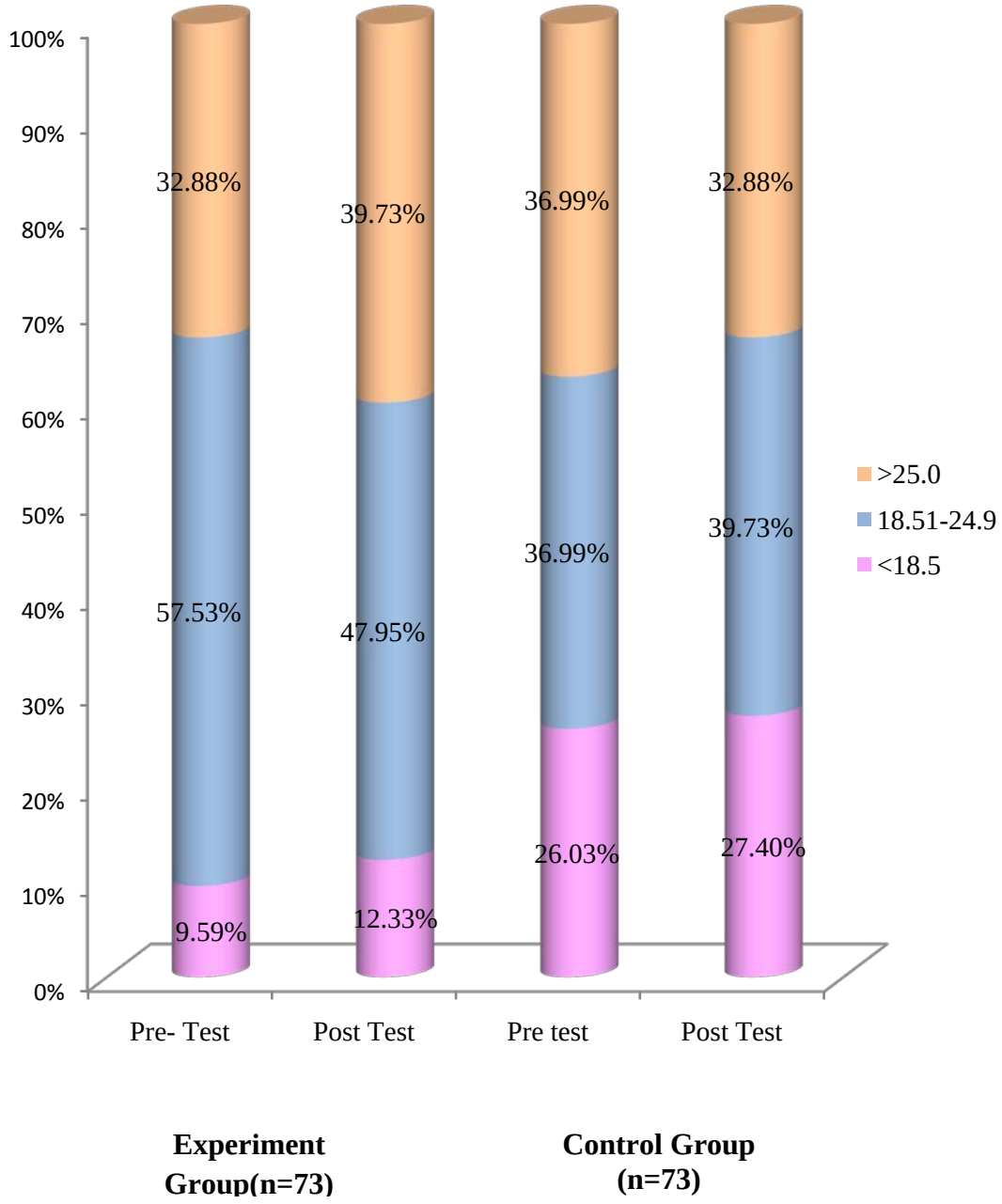


Figure 11: Distribution of samples based on BMI (Pre and Post MCI)

Figure 11 denotes the distribution of subjects based on BMI before and after the intervention. In the experiment group before intervention, 57.53% of the subjects were in the normal BMI range of 18.51- 24.9.This showed a reduction to 47.95% in the post intervention. In the control group in the pre intervention, 36.99%of subjects in the overweight BMI range of >25.0 was reduced to 32.88% post intervention.

SECTION 2

Prevalence of Health Promotion Practices

In this section, the prevalence of health promotion practices among rural elderly was summarized and tabulated as percentages in the aspects of primary and secondary prevention. Primary prevention was assessed in the areas of diet, exercise, injury prevention (which includes home and environment safety), sleep and relaxation and chemoprophylaxis. Secondary prevention included 7 general questions. Summated scoring for major health behaviors was done and tertiles were calculated to categorize the responses as poor, moderate and good. The data is presented in Table 4.2.1. Overall percentage of health promotion practice is presented in Figure 12.

Table 4.2.1: Prevalence of health promotion practices among the rural elderly

S.No.	HEALTH PROMOTION PRACTICES	N=146					
		Poor		Moderate		Good	
		No.	%	No.	%	No.	%
1.	**Primary Prevention**						
	a. Diet	60	41.1	50	34.2	36	24.7
	b. Exercise	57	39	70	47.9	19	13.0
	c. Injury prevention	51	34.9	52	35.6	43	29.5
	d. Self- care activities	55	37.7	84	57.5	7	4.8
	e. Sleep & relaxation	64	43.8	35	24	47	32.2
	f. Chemoprophylaxis	69	47.3	32	21.9	45	30.8
2.	**Secondary Prevention**	52	35.6	59	40.4	35	24.0

Table 4.2.1 shows that among the primary prevention aspects, the prevalence of health promotion practices of a majority of subjects were poor in areas of diet (41.1%), sleep and relaxation (43.8%) and chemoprophylaxis (47.3%); and moderate in aspects like exercise (47.9%), injury prevention (35.6%) and self-care activities (57.5%). In the aspect of secondary prevention, majority of the subjects (40.4%) health promotion practice was found to be moderate.

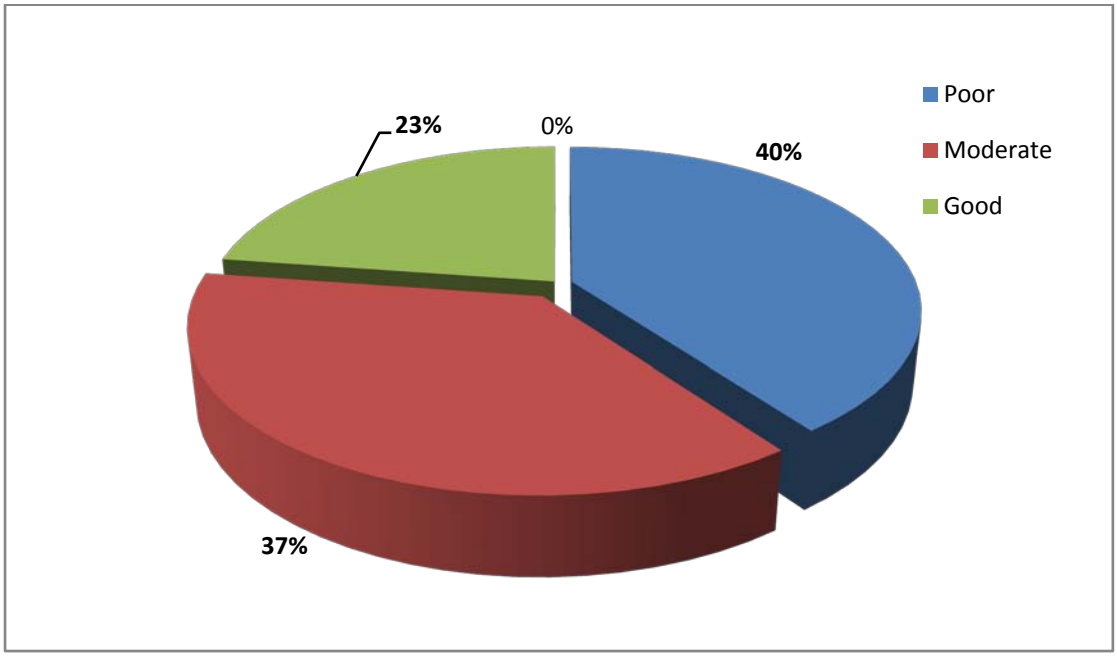


Figure 12: Overall distribution of subjects based on HPP

Figure 12 depicts the overall scores for HPP among the subjects. Majority of them 39.9% had poor HPP while 22.7% scored good.

SECTION 3

QUALITY OF LIFE

In this section the quality of life among the subjects in experiment and control groups, in the pre and post intervention was summarized and compared using percentages, Chi-square tests and p value. Data is presented in Table 4.3.1. and in Table 4.3.2

Table 4.3.1: Quality of Life among the experiment and control group

QOL DOMAINS			Health and functioning		Social / Economic		Psychological and Spiritual		Family	
			Poor	Good	Poor	Good	Poor	Good	Poor	Good
EXPERIMENT (n=	Pre	No.	50	23	41	32	46	27	40	33
		%	68.5	31.5	56.2	43.8	63	37	54.8	45.2
	Post	No.	20	53	13	60	25	48	24	49
		%	27.4	72.6	17.8	82.2	34.2	65.8	32.9	67.1
CONTROL (n = 73)	Pre	No.	36	37	40	33	41	32	39	34
		%	49.3	50.7	54.8	45.2	56.2	43.8	53.4	46.6
	Post	No.	55	18	60	13	59	14	51	22
		%	75.3	24.7	82.2	17.8	80.8	19.2	69.9	30.1
χ^2		Pre	5.55		0.28		0.71		0.03	
		Post	33.59		60.52		32.41		19.99	
***p* value**		Pre	**0.019***		0.868		0.399		0.868	
		Post	**0.000****		**0.000****		**0.000****		**0.000****	

***p* < 0.05, **p< 0.001**

Table 4.3.1 shows that in the four QOL domains assessed, there was an improvement in all domains in the subjects of the experiment group while there was noimprovement in the QOL of the subjects of the control group. The difference in the quality of life between the experiment and the control group in all the four domains has been analyzed and the difference between both the groups post intervention has been found to be statistically significant at p<0.001 level in all four domains – Health and functioning (0.000**), Social / Economic (0.000**), Psychological and Spiritual (0.000**) and Family (0.000**).

Table 4.3.2

Percentage improvement of the overall QOL in the good category of the experiment group

QOL Domains	Health and Functioning	Social/Economic	Psychological and Spiritual	Family
Pre Intervention	23	32	27	33
Post Intervention	53	60	48	49
% of Improvement	130	77.8	87.8	48.5

Table 4.3.2 shows that there was an overall improvement in all the domains of QOL. The percentage of improvement is above 50% in social/economic, psychological and spiritual domains and was above 100% in the health and functioning domain.

SECTION 4

Efficacy of Multi-Component Intervention on Quality of Life

This section presents findings on efficacy of the multi-component intervention strategy on the quality of life among subjects in the experiment and control groups. Change in QOL was calculated using mean difference, degree of freedom, standard deviation, 95% CI, and '*p*' value within the experiment and control group, pre and post intervention. This data is presented in Table 4.4.1 and 4.4.2. Efficacy of the multi-component intervention between experiment and control group was calculated using standard deviation, 95% CI, degree of freedom and test of significance. This data is presented in Table 7.2. p value < 0.05 as significant and $p< 0.001$ as highly significant.

Table 4.4.1: Change in quality of life within the experiment and control group (Pre and Post MCI)

S. No.	Groups	Mean	SD	Mean difference	't' value	95 % CI	df	p value
1.	**EXPERIMENT (N=73)**							
	QOL pre MCI	11.69	1.41	-5.713	-10.87	-6.76 to -4.66	72	**0.000****
	QOL post MCI	17.40	4.49					
2.	**CONTROL (N=73)**							
	QOL pre MCI	12.76	3.58	0.413	1.46	-0.63 to 1.46	72	0.433
	QOL post MCI	12.35	3.76					

***p* < 0.05, ***p*< 0.001**

Table 4.4.1 shows an increase in mean scores from 11.69 in the pre intervention to 17.40 in the post intervention for experiment group, where as in the control group the scores were 12.76 in the pre and 12.35 in the post intervention. The mean difference in the overall QOL scores between the pre MCI and post MCI for the experiment group was -5.713 which was found to be highly significant (0.000**) at $p < 0.001$ level.

Table 4.4.2: Efficacy of the MCI on QOL betweenexperiment and control group

QUALITY OF LIFE			Mean difference	df	't' value	95% CI	*p* value
Experiment	**Mean change**	5.71	6.13	144	8.25	4.66 to7.59	**0.000***
	SD	4.49					
Control	**Mean change**	-0.41					
	SD	4.48					

***p* < 0.05, ****p*< 0.001**

Table 4.4.2 shows that the mean difference in the change in QOL between pre MCI and post MCI in the experiment and control groups was found to be statistically significant (0.000*) at $p<0.001$ level. This demonstrates the efficacy of Multi-Component Intervention on Quality of Life.

SECTION 5

Association between Health Promotion Practices and baseline Quality of Life

This section presents data of association between health promotion practices and baseline quality of life (pre intervention) among all 146 subjects. Each aspect of health promotion was categorized, tabulated as poor, moderate and good which were compared with the four domains of quality of life, health and functioning, social/economic, psychological and spiritual and family. Mean QOL scores between the ranges of 0 to 30 were taken to categorize the overall score as poor (0-15) and good (16-30). Inferential statistics of Chi-square and *p* value was utilized to find association. Findings are presented in Tables 4.5.1 – 4.5.4. The *p* value < 0.05 was considered significant and < 0.001 as highly significant.

Table 4.5.1: Association between HPP and baseline QOL in domain of health and functioning among rural elderly

S.No.	Health Promotion Practices	Quality of life domain health and functioning (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
	Primary prevention						
	Diet						
1.	Poor	38	44.2	22	36.7		
	Moderate	29	33.7	21	35	1.06	0.588
	Good	19	22.1	17	28.3		
	Exercise						
2.	Poor	41	47.7	16	26.7		
	Moderate	39	45.3	31	51.7	10.15	**0.006***
	Good	6	7	13	21.7		
	Injury prevention						
3.	Poor	28	32.6	23	38.3		
	Moderate	31	36	21	35	0.62	0.735
	Good	27	31.4	16	26.7		
	Self –care activities						
	Poor	33	38.4	22	36.7		
4.	Moderate	52	60.5	32	53.3	6.10	**0.05***
	Good	1	1.2	6	10		

- *Contd.*

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain health and functioning (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
5.	**Primary Prevention**						
	Sleep & Relaxation						
	Poor	42	48.8	22	36.7		
	Moderate	22	25.6	13	21.7	4.26	0.119
	Good	22	25.6	25	41.7		
6.	**Chemoprophylaxis**						
	Poor	34	39.5	35	58.3		
	Moderate	18	20.9	14	23.3	7.89	**0.019***
	Good	34	39.5	11	18.3		
7.	**Secondary Prevention**						
	Poor	32	37.2	20	33.3		
	Moderate	35	40.7	24	40.0	0.46	0.794
	Good	19	22.1	16	26.7		

***p* < 0.05, ****p*< 0.001**

Table 4.5.1 shows that among the health promotion practices, exercise (0.006*), self-care activities (0.05*) and chemoprophylaxis (0.019*) have statistically significant association with QOL domain of health and functioning at $p < 0.05$ level.

Table 4.5.2: Association between HPP and baseline QOL in social/economic domain among rural elderly

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain social/economic (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
1.	**Primary prevention**						
	Diet	41	47.1	19	32.2		
	Poor	33	37.9	17	28.8	10.99	**0.004***
	Moderate	13	14.9	23	39		
	Good						
2.	**Exercise**						
	Poor	40	46	17	28.8		
	Moderate	43	49.4	27	45.8	14.47	**0.001****
	Good	4	4.6	15	25.4		
3.	**Injury prevention**						
	Poor	31	35.6	20	33.9		
	Moderate	31	35.6	21	35.6	0.07	0.967
	Good	25	28.7	18	30.5		
4.	**Self- care activities**						
	Poor	30	34.5	25	42.4		
	Moderate	57	65.5	27	45.8	13.29	**0.001****
	Good	-	-	7	11.9		

- *Contd.*

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain social/economic (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
5.	**Primary Prevention**						
	Sleep & Relaxation						
	Poor	42	48.3	22	37.3		
	Moderate	21	24.1	14	23.7	2.34	0.303
	Good	24	27.6	23	39		
6.	**Chemoprophylaxis**						
	Poor	43	49.4	26	44.1		
	Moderate	19	21.8	13	22	0.52	0.772
	Good	25	28.7	20	33.9		
7.	**Secondary Prevention**						
	Poor	34	39.1	18	30.5		
	Moderate	38	43.7	21	35.6	5.36	0.068
	Good	15	17.2	20	33.9		

***p* < 0.05, ****p*< 0.001

Table 4.5.2 shows that among the health promotion practices, diet (0.004*) has significant association while exercise (0.001**) and self-care activities (0.001**) has highly significant association that has reached statistical significance with social/economic domain of QOL at *p*< 0.05 and *p*< 0.001 level respectively.

Table 4.5.3: Association between HPP and baseline QOL in psychological and spiritual domain among rural elderly

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain psychological & spiritual (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
	Primary prevention						
	Diet						
1.	Poor	38	46.9	22	33.8		
	Moderate	30	37	20	30.8	7.38	**0.025***
	Good	13	16	23	35.4		
	Exercise						
2.	Poor	36	44.4	21	32.3		
	Moderate	39	48.1	31	47.7	5.76	0.056
	Good	6	7.4	13	20		
	Injury prevention						
3.	Poor	28	34.6	23	35.4		
	Moderate	32	39.5	20	30.8	1.55	0.461
	Good	21	25.9	22	33.8		
	Self- care activities						
4.	Poor	29	35.8	26	40		
	Moderate	52	64.2	32	49.2	10.51	**0.004***
	Good	-	-	7	10.8		

- *Contd.*

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain psychological & spiritual (N = 146)				χ^2	*p*-value
		Poor		Good			
		No.	%	No.	%		
	Primary Prevention						
	Sleep & Relaxation						
5.	Poor	35	43.2	29	44.6		
	Moderate	23	28.4	12	18.5	2.32	0.314
	Good	23	28.4	24	36.9		
	Chemoprophylaxis						
6.	Poor	41	50.6	28	43.1		
	Moderate	19	23.5	13	20	2.05	0.360
	Good	21	25.9	24	36.9		
	Secondary Prevention						
	Poor	32	39.5	20	30.8		
7.	Moderate	38	46.9	21	32.3	10.87	**0.004***
	Good	11	13.6	24	36.9		

***p* < 0.05, **p< 0.001**

Table 4.5.3 shows that the health promotion practices such as diet (0.025*), self-care activities (0.004*) and secondary prevention activities (0.004*) have a statistically significant association with the psychological and spiritual domain of QOL at $p < 0.05$ level.

Table 4.5.4Association between HPP and baselineQOL in family domain among rural elderly

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain Family (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
	Primary prevention						
	Diet						
1.	Poor	43	54.4	17	25.4		
	Moderate	24	30.4	26	38.8	14.46	**0.001****
	Good	12	15.2	24	35.8		
	Exercise						
2.	Poor	37	46.8	20	29.9		
	Moderate	36	45.6	34	50.7	6.77	**0.034***
	Good	6	7.6	13	19.4		
	Injury prevention						
3.	Poor	34	43	17	25.4		
	Moderate	26	32.9	26	38.8	5.30	0.071
	Good	19	24.1	24	35.8		
	Self- care activities						
4.	Poor	29	36.7	26	38.8		
	Moderate	48	60.8	36	53.7	2.12	0.380
	Good	2	2.5	5	7.5		

- *Contd.*

S.No.	HEALTH PROMOTION PRACTICES	Quality of life domain Family (N = 146)				χ^2	*p* value
		Poor		Good			
		No.	%	No.	%		
5.	**Primary prevention**						
	Sleep & Relaxation						
	Poor	39	49.4	25	37.3		
	Moderate	17	21.5	18	26.9	2.14	0.343
	Good	23	21.9	24	35.8		
6.	**Chemoprophylaxis**						
	Poor	50	63.3	19	28.4		
	Moderate	12	15.2	20	29.9	17.75	**0.000****
	Good	17	21.5	28	41.8		
7.	**Secondary Prevention**						
	Poor	38	48.1	14	20.9		
	Moderate	29	36.7	30	44.8	13.66	**0.001****
	Good	12	15.2	23	34.3		

***p* < 0.05, **p< 0.001**

Table 4.5.4 reveals significant association between health promotion practice of exercise (0.034*); highly significant association between the health promotion practices of diet (0.001**), chemoprophylaxis (0.000**), secondary prevention activities (0.001**) and the QOL domain of family at $p< 0.05$ and $p< 0.001$ level respectively. It is found that their association has reached statistical significance.

SECTION 6

Association of Health promotion practices with selected demographic and socio-economic variables

This section presents data regarding association between health promotion practices and selected demographic and socio-economic variables of age, sex, education, marital status and financial stability. Health promotion practices were categorized as poor, moderate and good. Inferential statistics of Chi-square and *p*-value was calculated to find association. The *p*-value < 0.05 was taken as significant and < 0.001 as highly significant. Each aspect of health promotion is presented in separate tables from Tables 4.6.1 – 4.6.7.

Table 4.6.1: Association of HPP – diet with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP - Diet (N = 146)						$\chi 2$	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
1.	**Age (years)**								
	60-65	6	10	10	20	9	25		
	>65	54	90	40	80	27	75	4.01	0.135
2.	**Sex**								
	Male	18	29.5	23	46.9	20	55.6		
	Female	43	70.5	26	53.1	16	44.4	7.01	**0.030***
3.	**Education**								
	Uneducated	46	76.7	30	60	18.0	50		
	Primary	13	21.7	19	38	17.0	47.2	10.92	**0.028***
	Higher Sec	1.0	1.7	1.0	2.0	-	-		
	Graduate	-	-	-	-	1.0	2.8		
4.	**Marital status**								
	Married	26	43.3	35	70	34	94.4		
	Widow/widower	31	51.7	15	30	2	5.6	29.02	**0.000****
	Separated	3	5	-	-	-	-		
5.	**Financial stability**								
	Independent	1	1.7	2	4	2	5.6		
	Partially dependent	17	28.3	23	46	23	63.9	14.52	**0.006***
	Fully dependent	42	70	25	50	11	30.6		

***p* < 0.05, **p< 0.001**

Table 4.6.1 demonstrates the significant association of Health promotion practices of diet with demographic and socio- economic variables such as sex (0.030*), education (0.028*), financial stability (0.006*) and highly significant association with the marital status (0.000**), all reaching statistical significance at *p < 0.05, **p < 0.001 levels.

Table 4.6.2: Association of HPP – exercise with selected demographic and socio-economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP - Exercise (N = 146)						$\chi 2$	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
	Age (years)								
1.	60-65	1	1.8	16	22.9	8	42.1	21.34	**0.000****
	>65	56	98.2	54	77.1	11	57.9		
	Sex								
2.	Male	21	36.8	31	44.3	9	47.4	0.90	0.637
	Female	36	63.2	39	55.7	10	52.6		
	Education								
	Uneducated	50	87.7	37	52.9	7	36.8		
3.	Primary	7	12.3	31	44.3	11	57.9	28.77	**0.000****
	Higher secondary	-	-	2	2.9	-	-		
	Graduate	-	-	-	-	1	5.3		
	Marital status								
4.	Married	28	49.1	50	71.4	17	89.5		
	Widow/widower	27	47.4	19	27.1	2	10.5	12.44	**0.007***
	Separated	2	3.5	1	1.4	-	-		
	Financial stability								
5.	Independent	1	1.8	3	4.3	1	5.3		
	Partially dependent	12	21.1	38	54.3	13	68.4	22.60	**0.000****
	Fully dependent	44	77.2	29	41.4	5	26.3		

******p* **< 0.05, *****p*< **0.001**

Table 4.6.2 shows the significant association of Health promotion practice of Exercise with demographic and socio- economic variables such as marital status (0.007*), and highly significant association with age (0.000**), education (0.000**) and financial stability (0.000**), all reaching statistical significance at *p< 0.05, **p < 0.001 levels.

Table 4.6.3: Association of HPP – injury prevention with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP – INJURY PREVENTION (N = 146)						$\chi 2$	*p* Value
		Poor		Moderate		Good			
		No.	%	No.	%	No	%		
1.	**Age (years)**								
	60-65	8	15.7	8	15.4	9	20.9	0.62	0.732
	>65	43	84.3	44	84.6	34	79.1		
2.	**Sex**								
	Male	16	31.4	20	38.5	25	58.1	7.33	**0.026***
	Female	35	68.6	32	61.5	18	41.9		
3.	**Education**								
	Uneducated	32	62.7	36	69.2	26	60.5		
	Primary	18	35.3	16	30.8	15	34.9	4.00	0.772
	Higher secondary	1	2	-	-	1	2.3		
	Graduate	-	-	-	-	1	2.3		
4.	**Marital status**								
	Married	27	52.9	33	63.5	35	81.4		
	Widow/widower	21	41.2	19	36.5	8	18.6	10.78	**0.013***
	Separated	3	5.9	-	-	-	-		
5.	**Financial stability**								
	Independent	1	2	2	3.8	2	4.7		
	Partially dependent	17	33.3	20	38.5	26	60.5	9.09	0.059
	Fully dependent	33	64.7	30	57.7	15	34.9		

***p* < 0.05, ****p*< 0.001**

Table 9.3 denotes the significant association of Health promotion practice – Injury prevention with demographic and socio- economic variables such as sex (0.026*) and marital status (0.013*) reaching statistical significance at *$p < 0.05$ level.

Table 4.6.4: Association of HPP – self-care activities with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP – Self-Care Activities (N = 146)						χ2	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
	Age (years)								
1.	60-65	7	12.7	14	16.7	4	57.1	6.89	**0.023***
	> 65	48	87.3	70	83.3	3	42.9		
	Sex								
2.	Male	46	83.6	12	14.5	3	37.5	70.10	**0.000****
	Female	9	16.4	71	85.5	5	62.5		
	Education								
	Uneducated	29	52.7	62	73.8	3	42.9		
3.	Primary	23	41.8	22	26.2	4	57.1	12.75	**0.027***
	Higher Sec	2	3.6	-	-	-	-		
	Graduate	1	1.8	-	-	-	-		
	Marital status								
4.	Married	42	76.4	47	56	6	85.7		
	Widow/widower	13	23.6	34	40.5	1	14.3	7.98	0.065
	Separated	-	-	3	3.6	-	-		
	Financial stability								
5.	Independent	3	5.5	2	2.4	-	-		
	Partially dependent	31	56.4	28	33.3	4	57.1		
	Fully dependent	21	38.2	54	64.3	3	42.9	9.98	**0.041***

***p* < 0.05, **p< 0.001**

Table 4.6.4 reveals the significant association of Health promotion practice – Self care activities with demographic and socio-economic variables such as age (0.023*), education (0.027*) and financial stability (0.041*), and highly significant association with sex (0.000**), all reaching statistical significance at *p < 0.05, **p < 0.001 levels.

Table 4.6.5: Association of HPP – sleep and relaxation with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP – Sleep And Relaxation (N = 146)						$\chi 2$	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
1.	**Age (years)**								
	60-65	10	15.6	7	20	8	17	0.31	0.858
	>65	54	84.4	28	80	39	83		
2.	**Sex**								
	Male	19	43.2	15	42.9	27	56.3	7.67	**0.022***
	Female	44	69.8	20	57.1	21	43.7		
3.	**Education**								
	Uneducated	46	71.9	20	57.1	28	59.6		
	Primary	18	28.1	14	40	17	36.2	6.16	0.311
	Higher secondary	-	-	1	2.9	1	2.1		
	Graduate	-	-	-	-	1	2.1		
4.	**Marital status**								
	Married	34	53.1	26	74.3	35	74.5		
	Widow/widower	29	45.3	8	22.9	11	23.4	8.29	**0.046***
	Separated	1	1.6	1	2.9	1	2.1		
5.	**Financial stability**								
	Independent	2	3.1	-	-	3	6.4		
	Partially dependent	22	34.4	16	45.7	25	53.2	7.19	0.126
	Fully dependent	40	62.5	19	54.3	19	40.4		

***p* < 0.05, ****p*< 0.001**

Table 4.6.5 shows the significant association of Health promotion practice – Sleep and relaxation with demographic and socio-economic variables such as sex (0.022*) and marital status (0.046*) reaching statistical significance at *p< 0.05 level.

Table 4.6.6: Association of HPP – chemoprophylaxis with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP – Chemoprophylaxis (N = 146)						$\chi 2$	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
	Age (years)								
1.	60-65	11	15.9	4	12.5	10	22.2	1.37	0.503
	>65	58	84.1	28	87.5	35	77.8		
	Sex								
2.	Male	23	32.9	17	53.1	21	47.7	4.36	0.113
	Female	47	67.1	15	46.9	23	52.3		
	Education								
	Uneducated	45	65.2	15	46.9	34	75.6		
3.	Primary	22	31.9	16	50	11	24.4	10.15	**0.045***
	Higher secondary	2	2.9	-	-	-	-		
	Graduate	-	-	1	3.1	-	-		
	Marital status								
4.	Married	41	59.4	23	71.9	31	68.9		
	Widow/widower	26	37.7	8	25	14	31.1	3.15	0.524
	Separated	2	2.9	1	3.1	-	-		
	Financial stability								
5.	Independent	2	2.9	2	6.2	1	2.2	4.37	
	Partially dependent	25	36.2	17	53.1	21	46.7		0.359
	Fully dependent	42	60.9	13	40.6	23	51.1		

***p* < 0.05, ****p*< 0.001**

Table 4.6.6 demonstrates statistically significant association of Health promotion practice – Chemoprophylaxis with the demographic and socio-economic variable of education (0.045*) at **p* < 0.05 level.

Table 4.6.7: Association of HPP – secondary prevention with selected demographic and socio- economic variables among rural elderly

S.No.	Demographic and socio-economic variables	HPP – Secondary Prevention (N = 146)						$\chi 2$	*p* value
		Poor		Moderate		Good			
		No.	%	No.	%	No.	%		
	Age (years)								
1.	60-65	7	13.5	13	22	5	14.3	1.69	0.429
	>65	45	86.5	46	78	30	85.7		
	Sex								
2.	Male	16	31.4	30	50	15	42.9	4.13	0.127
	Female	35	68.6	30	50	20	57.1		
	Education								
	Uneducated	35	67.3	36	61	23	65.7		
3.	Primary	15	28.8	23	39	11	31.4	6.05	0.323
	Higher secondary	2	3.8	-	-	-	-		
	Graduate	-	-	-	-	1	2.9		
	Marital status								
4.	Married	28	53.8	41	69.5	26	74.3		
	Widow/widower	22	42.3	17	28.8	9	25.7	5.03	0.224
	Separated	2	3.8	1	1.7	-	-		
	Financial stability								
5.	Independent	1	1.9	1	1.7	3	8.6		
	Partially dependent	18	34.6	32	54.2	13	37.1	7.56	0.081
	Fully dependent	33	63.5	26	44.1	19	54.3		

***p* < 0.05, ***p*< 0.001**

Table 4.6.7 reveals no association between Health promotion practice of Secondary prevention and the demographic and socio-economic variables.

SECTION 7

Association of baseline Quality of Life with selected demographic and socio-economic variables

This final section presents data in relation to association between baseline quality of life (pre intervention) and selected demographic and socio-economic variables. Each of the four quality of life domains are presented in separate tables. The demographic and socio-economic variables that were used for association were age, sex, education, marital status and financial stability. Quality of life was calculated as poor and good. Inferential statistics of Chi-square and *p* value were utilized to find association and test significance between these variables. The $p<0.05$ was considered significant and<0.001 as highly significant. Findings are tabulated and presented in Tables 4.7.1 – 4.7.4.

Table 4.7.1: Association of baseline QOL domain of health and functioning with selected demographic and socio-economic variables among rural elderly

S. No.	Demographic and Socio-economic variables	Quality Of Life Domain Health and functioning (N = 146)				$\chi 2$	*p* value
		Poor		Good			
		No.	%	No.	%		
1.	***Age(years)***						
	60-65	12	14	13	21.7	1.482	0.224
	>65	74	86	47	38.8		
2.	***Sex***						
	Male	36	41.9	25	41.7	0.053	0.819
	Female	50	58.1	35	58.3		
3.	***Education***						
	Uneducated	62	72.1	32	53.3		
	Primary	23	26.7	26	43.3	6.480	**0.038***
	Higher secondary	1	1.2	1	1.7		
	Graduate	-	-	1	1.7		
4.	***Maritalstatus***						
	Married	50	58.1	45	75		
	Widow/widower	34	39.5	14	23.3	4.531	0.088
	Separated	2	2.3	1	1.7		
5.	***Financial stability***						
	Independent	2	2.3	3	50		
	Partially dependent	32	37.2	31	51.7	4.451	0.093
	Fully dependent	52	60.5	26	43.3		

***p* < 0.05, **p< 0.001**

Table 4.7.1 shows the association of baseline QOL in health and functioning domain with the demographic and socio-economic variable education (0.038*) reaching statistical significance at $P < 0.05$* level.

Table 4.7.2: Association of baseline QOL domain of social/economic with selected demographic and socio-economic variables among rural elderly

S.No.	Demographic and Socio-economic variables	Quality Of Life Domain Social/economic (N = 146)				$\chi 2$	p value
		Poor		Good			
		No.	%	No.	%		
	Age(years)						
1.	60-65	13	14.9	12	20.3	0.72	0.396
	>65	74	85.1	47	79.7		
	Sex						
2.	Male	32	35.9	29	50.9	4.16	**0.041***
	Female	57	64.1	28	49.1		
	Education						
	Uneducated	60	69.0	34	57.6		
3.	Primary	26	29.9	23	39	3.32	0.317
	Higher secondary	1	1.1	1	1.7		
	Graduate	-	-	1	1.7		
	Maritalstatus						
4.	Married	49	56.3	46	78		
	Widow/widower	36	41.4	12	20.3	7.50	**0.015***
	Separated	2	2.3	1	1.7		
	Financial stability						
5.	Independent	2	2.3	3	5.1		
	Partially dependent	37	42.5	26	44.1	1.02	0.621
	Fully dependent	48	55.2	30	50.8		

***p<0.05, **p<0.001**

Table 4.7.2 shows association between baseline QOL in Social-economic domain and the demographic and socio-economic variables like sex (0.041*) and marital status (0.015*) reaching statistical significance at $p< 0.05$ level.

Table 4.7.3: Association of baseline QOL of psychological and spiritual domain with selected demographic and socio-economic variables among rural elderly

S.No.	Demographic and Socio-economic variables	QUALITY OF LIFE DOMAIN Psychological and spiritual (N = 146)				$\chi 2$	*p* value
		Poor		Good			
		No.	%	No.	%		
	Age(years)						
1.	60-65	12	14.8	13	20	0.68	0.408
	>65	74	85.2	52	80		
	Sex						
2.	Male	33	40.2	28	43.8	0.49	0.484
	Female	49	59.8	36	56.2		
	Education						
	Uneducated	50	61.7	44	67.7		
3.	Primary	30	37	19	29.2	2.30	0.578
	Higher secondary	1	1.2	1	1.5		
	Graduate	-	-	1	1.5		
	Maritalstatus						
4.	Married	51	63	44	67.7		
	Widow/widower	27	33.3	21	32.3	2.15	0.364
	Separated	3	3.7	-	-		
	Financial stability						
5.	Independent	2	2.5	3	4.6		
	Partially dependent	33	40.7	30	46.2	1.19	0.569
	Fully dependent	46	56.8	32	49.2		

***p* < 0.05, *******p*< 0.001**

Table 4.7.3 shows that there is no association of baseline QOL in psychological and spiritual domain with any of the demographic and socio-economic variables.

Table 4.7.4: Association of baseline QOL domain of family with selected demographic and socio-economic variables among rural elderly

S.No.	Demographic and Socio-economic variables	QUALITY OF LIFE DOMAIN Family (N = 146)				$\chi 2$	*p* value
		Poor		Good			
		No.	%	No.	%		
	Age(years)						
1.	60-65	9	11.4	16	23.9	3.98	**0.046***
	>65	70	88.6	51	76.1		
	Sex						
2.	Male	30	37.5	31	47	2.09	0.148
	Female	50	62.5	35	53		
	Education						
	Uneducated	53	67.1	41	61.2		
3.	Primary	25	31.6	24	35.8	1.768	0.767
	Higher secondary	1	1.3	1	1.5		
	Graduate	-	-	1	1.5		
	Maritalstatus						
4.	Married	42	53.2	53	79.1		
	Widow/widower	35	44.3	13	19.4	10.96	**0.002***
	Separated	2	2.5	1	1.5		
	Financial stability						
5.	Independent	2	2.5	3	4.5		
	Partially dependent	30	38	33	49.3	2.71	0.247
	Fully dependent	47	59.5	31	46.3		

***p* < 0.05, **p< 0.001**

Table 4.7.4 shows statistically significant association of baseline QOL in family domain with demographic and socio-economic variables such as age (0.046*) and marital status (0.002*) at *p*< 0.05* level.

CHAPTER 5

DISCUSSION

This CRT was undertaken with two major aims in mind. Firstly, to identify the existing health promotion practices among the rural elderly and secondly, to evaluate the efficacy of a MCI and measure the quality of life of the subjects before and after the intervention. Kaniyambadi block in Vellore district was selected to conduct the study. Permission was sought from the village administration. Of the 84 villages in this block, 73 did not fulfill the inclusion criteria. Eleven villages qualified to participate in the study. By lottery method, three villages were randomized as the experiment group and the subsequent three were allocated as the control group. All the elders in those villages who showed interest were recruited for the study. There were 148 elders who fulfilled the inclusion criteria after Barthels' score was assessed, of which 75 subjects were allotted to the experiment group and 73 were in the control group. Two of the subjects in the experiment group were lost to follow- up, since one expired in the 6^{th} month and the other relocated in the third month of the study, thereby bringing down the sample size to 146 (73 in experiment + 73 in control group). In CRT's, it is required that correlation **within** group and **between** groups are calculated in order to check that the findings were not affected due to inadequate sample size.Intra-Cluster Correlation (ICC) was calculated as follows:

1. Taking the difference in QOL between experiment and control group as the outcome:

   Variance at village level (between) = 0.1083

   Variance within village = 20.9677

   ICC = 0.1083/(0.1083+20.9677) = 0.0051

2. Taking QOL pre scores between both groups as the outcome:

   Variance at village level (between) = 0.00001

Variance within village	=	6.5208
ICC	=	0.000001

Both calculations show that ICC is quite small and hence did not need any adjustment for cluster effect.

5.1 Demographic and socio-economic characteristics

Demographic and socio-economic characteristics were collected, with a view of better understanding of the population under study. There were 25 (17.1%) of the subjects in the age group of 60-65 years, while majority 121 (82.9%) were above the age of 65. There were more females 85 (58.2%) compared to males 61 (41.8%). The findings demonstrated that 139 (95.2%) of the subjects belonged to the Hindu religion. Present occupational status showed that 57 (39%) of the subjects were not working, while the others undertook meager jobs, whenever health and time permitted. In spite of having work, only 5(3.4%) of the subjects were financially independent. Most were fully dependent 78 (53.4%). This was so, because they reported that they had to hand over their earnings to their children / relatives and from which they would be given small sums for their personal expenses. Major sources of income were from government old age pension 106 (72.6%), and military pension 33 (22.6%). It was surprising to note that even though all of the subjects qualified for the government pension, they were unable to complete the formalities and access the financial assistance. Marital status information showed that in 95 (65.1%) of the subjects were married; while a small number 3 (2.1%) had separated. Those subjects who were widowed were 48 (32.9%). In relation to education 55 (75.34%) of the subjects in the experiment group and 39 (53.42%) in the control group were uneducated. It was noted that 30 (41.1%) of subjects in the experiment group and 24 (32.88%) in the control group lived with their spouses, while 34 (46.58%) of the subjects in both groups lived with their children. Among personal habits of subjects, it

was noted that the elders were aware of the ill effects of smoking and alcohol since findings showed that 94 (64.4%) of the subjects did not smoke while 91 (62.3%) of the subjects did not consume alcohol. Co-morbidity profile of the elders were tabulated taking into account the most worrisome health condition that was perceived by the elder, even though he/ she may have had more than one co-morbidity. The findings were eye opening because it was noted that only 17.12% of the subjects reported nil co-morbidity. The highest percentage (17.81%) of subjects had vision problems. This was followed by those with joint pains and hearing impairment (17.12%). These findings are supported byKabir's study (1998) (139)in Bangladesh where she has reported that women outnumbered men (62.8% and 41.1%) respectively, uneducated were 84.4%, occupational status of those not working were 52.3%. The number of widowed subjects was higher (67.2%) than the present study as also those staying with children (69.9%). Morbidity profile supported the study findings where 75.7% reported vision problems and 36.3% had hearing problems. Rybash and colleagues (1998) (140)reported similar findings where 86% of the population over 65 years had one or more chronic conditions with varying disability.

5.2 Prevalence of health promotion practices

The first objective was to identify the prevalence of health promotion practices among the rural elderly.

HPP was assessed using a 37-item questionnaire, which gave information on the elderly practices in relation to activities of primary prevention for diet, exercise, injury prevention, sleep and relaxation, chemoprophylaxis and secondary prevention. It was found that among the primary prevention aspects, the prevalence of health promotion practices of a

majority of subjects were poor in areas of diet (41.1%), sleep relaxation (43.8%) and chemoprophylaxis (47.3%). The prevalence of health promotion practices was moderate in aspects like exercise (47.9%), injury prevention (35.6%) and self-care activities (57.5%). In secondary prevention, health promotion practice was found to be moderate in a majority 40.4% of the subjects (Table 4.2.1).

According to Naidoo and Wills (2000) (7) a holistic approach to health promotion takes into account the wide range of dimensions, which encompass the health of an individual - physical, mental, social, spiritual, sexual and economic, with an inter-dependence on contextual factors such as environment and safety. Of all the aspects of HPP, it was found that most of the subjects were poor in the practice of chemoprophylaxis. This could be due to lack of awareness or provision to take prophylactic medication and immunizations. Also, family support for this is crucial. Poverty and poor transport facilities could add to this as the elder would need to travel to the nearest clinic/hospital to access medications.

In the study it was found that 51(34.9%) and 52(35.6%) of the subjects had poor and moderate practice of injury prevention and home environment respectively (Table 4.2.1). Similar findings were reported where an environmental assessment of old age homes of 1000 persons aged 72 and older showed that the prevalence of environmental hazards was high(57).Two or more hazards were found in 59% of the bathrooms and in 23% to 42% of the remaining rooms.

The overall HPP of the subjects demonstrated that 39.9% had poor, 37.4% moderate and 22.7% good HPP (Figure 13). These findings are not encouraging, since primary and secondary health promotion is very essential for all elderly in order that they would enjoy their years without the discomforts of old age made worse by ill health. All of the

components of HPP are easily ‘do’ able, and it is time that decision-makers and family combine their efforts towards ensuring a healthy life for the elderly.

5.3 Quality of life among the elderly

The second objective was to determine QOL among the elderly

The Ferrans’ and Powers’ QOL index version III consisted of 33 items which elicited information regarding four domains. The instrument was applied to the experiment and control groups before and after the multi- component and intervention was conducted. QOL was assessed under four major domains.

Health and functioning: Findings (Table 4.3.1) demonstrated that 50 (68.5%) of the subjects in the experiment group and 36 (49.3%) in the control group had scored poor in the pretest. These findings showed reduction to 20 (27.4%) in the experiment group and an increase to 55 (75.3%) in the control group. Among the subjects in the experiment group who scored good in the pre-intervention 23 (31.5%), showed an upward increase to 53 (72.6%) in the post intervention. This was in contrast to the subjects in the control group 37 (50.7%) who scored good in the pre intervention, which reduced to 18 (24.7%) in the post intervention. The improvement made in the post interventionover the pre interventionwas found to be highly significant (0.000*) reaching statistical significance. This clearly showed that the QOL in this domain showed marked improvement in the experiment group after the MCI, while the control group did not. However 20 (27.4%) of the subjects in the experiment group had poor QOL. This could partly be attributed to the physiologic factors like age, sex and other factors like financial stability that caused them to perceive this QOL domain as poor.

Social / Economic: Findings in this domain indicate that in the experiment group in the pre intervention stage, there were 41 (56.2%) of the subjects in the poor category, which

reduced to 13 (17.8%) in the post intervention, whereas there were 41 (56.2%) of the subjects in the control group who scored poor in the pre stage, which increased to 59 (80.8%) in the post intervention. Among the subjects that scored good in the experiment group, pre intervention was 27 (37%) which increased to 48 (65.8%) in the post stage, while in the control group 32 (43.8%) of subjects in the pre intervention who scored good showed a decrease to 14 (19.2%) in the post intervention. The improvement made in the post test over the pretest was found to be highly significant (0.000*) reaching statistical significance. This clearly showed that the QOL in this domain showed marked improvement in the experiment group after the MCI, while the control group did not.

Psychological and Spiritual: In this domain the subjects in the experiment group showed an increase from 32 (43.8%) in the pre intervention to 60 (82.2%) in the post intervention, whereas in the control group, 33 (45.2%) of the subjects in the pre stage scored good, which reduced to 13 (17.8%) in the post intervention. The improvement made in the post test over the pretest was found to be highly significant (0.000*) reaching statistical significance. The reason for significant findings could be attributed to the MCI that the subjects in the experiment group received, even though it is presumed that people tend to become more spiritual as they age. Another reason could be the attention, psychological support and the social interaction between peers, experienced by the subjects in the experiment group which could have influenced their perceptions in this domain, which was not available to the subjects in the control group. The factors that could contribute to the positive findings is the effect of the MCI coupled with the sense of camaraderie that the subjects experienced while with their peers, in spite of no change in their economic status.

Family: This domain of the QOL showed that 40 (54.8%) of the subjects in experiment group scored poor in the pre intervention which was reduced to 24 (32.9%)

subjects in the post intervention. Whereas there were 39 (53.4%) of subjects in control group in the pre intervention, which increased to 51 (69.9%) in the post. Those who scored in the good category among the subjects in experimental group were 33 (45.2%), which increased to 49 (67.1%) in the post, while there was a reduction from 34 (46.6%) of subjects in the pre intervention who scored good, to 22 (30.1%) in the post. The improvement made in the post test over the pretest was found to be highly significant (0.000*) reaching statistical significance. This clearly showed that the QOL in this domain showed marked improvement in the experiment group after the MCI, while the control group did not.

There was an overall improvement in the goodcategory of the experiment group (Table 4.3.2). The percentage of improvement is above 50% in domains of social/economic, psychological and spiritual and was above 100% in the domain of health and functioning. This was much more than anticipated before the study was initiated. A study carried out by Shandrilla (2003) (141) reported that 30% of subjects in experiment group who had 'poor' QOL scores before the intervention had 100% 'good' scores post. Browne and colleagues' (1994) (121) research among the elderly contradicted the findings of the present study. They demonstrated that quality of life levels were significantly higher at baseline (t=–2.04; p=0.04) than that of a previously studied sample of healthy adults below 65 years of age, and did not change significantly over the study period. Bowling and colleagues (2007) found that twenty-one per cent of respondents reported fair to very severe levels of functional difficulty, and 62% of these rated their QOL as good.

5.4 Efficacy of the multi-component intervention on the quality of life

The third objective was to measure the efficacy of the MCI on the QOL of the experiment and control group

There was an increase in mean scores from 11.69 in the pre intervention to 17.40 in the post interventionfor experiment group, where as in the control group the scores were 12.76 in the pre and 12.35 in the post intervention. The mean difference in the overall QOL scores between the pre MCI and post MCI for the experiment group was -5.713 which was found to be highly significant (0.000**) at $p < 0.001$ level (Table 7.1). This indicates that the MCI had a definite impact in the QOL of the subjects in the experiment group. The intervention was a safe, inexpensive, enjoyable and easy to perform experience for the elders, which was also timed according to their convenience and leisure, so that they could attend regularly. In support of the study, Matsuo (2003) reported that QOL of the intervention group was significantly higher than the control group as expected. The perceptual difference between the 2 groups obtained by the correspondence and cluster analyses was that although the elderly of the intervention group were satisfied and not bored with their current life, this trend was not clear for the control group.

On inspection of the attendance registers it was encouraging to note that none of the subjects absented themselves for more than one day per week. The success of the positive findings could be attributed to enthusiasm and motivation of the volunteers and the subjects themselves. Examining the findings of the efficacy of the MCI on QOL between the experiment and control group the mean difference in the change in QOL between pre MCI and post MCI in the experiment and control groups was found to be statistically significant (0.000*) at $p<0.001$ level, proving the efficacy of the MCI on the quality of life of the rural elderly. Oida et al. (2003) (80)study results suggested that the rates of participant compliance per year were 67.7% in the first year of the intervention period and gradually decreased thereafter to 43.9% in the last year. Amongst female subjects the percentage of those who exercised habitually at the end of the study period was the same as that in the baseline in the

intervention group but was significantly lower at the end of the study in the control group (2 = 10.576, $p < 0.01$).

5.5 Association between health promotion practices and baseline quality of life

The fourth objective was to find association between HPP and the various domains of baseline QOL among the elderly.

All seven major health promotion practices included in primary and secondary prevention were associated with the baseline QOL in all four domains. It was found that among the health promotion practices, exercise (0.006*), self-care activities (0.05*) and chemoprophylaxis (0.019*) have statistically significant association with QOL domain of health and functioning at $p < 0.05$ level (Table 4.5.1).

Health and Functioning: There was no significance noted for diet and QOL domain of health and functioning. This could be due to reason that elders do not have any control on the diet they are served. Added to this would be problems of dentition, reduced taste, loss of appetite, and the reality that many elders in the village are served only two meals a day. These reasons were noted from responses to the questionnaire. There is much scope in educating the elders and family members about a diet suited to the requirements of the elder. These findings will serve to sensitize the community leaders and government to initiate a nutrition program for all elders in the villages, who seem to lack appropriate quantity and quality of food. Many of the elders voiced a need to be served lunch. This indicated that they did not get adequate food in their homes.

In the aspect of exercise it was noted that 41 (47.7%) of the subjects who had poor exercise were also poor in the QOL domain, while 16 (26.7%) of those with poor exercise had good QOL. Among the subjects with good exercise, 6 (7%) scored poor in QOL, while

13 (21.7%) had good QOL. Looking at the figures it appears that irrespective of exercise, elders fall into the category of poor and good QOL. But statistical analysis shows a significant association (p = 0.006*) between exercise and health and functioning among the rural elderly. Lack of awareness of simple isometric exercises, and taking short walks affects their perception of health and functioning. It is a viable proposition for the local community to ensure that there are safe roads for the elders to take a walk and initiate day care centers where community health workers could teach the elders simple exercises that have many proven health benefits.

There was no association noted between injury prevention and the QOL domain of health and functioning. The findings could be an indication as disclosed by the elderly to the investigator that they do not have any control over home environment, when they live with their children. If they live on their own, they do not think it necessary, or have the knowledge or finance to modify their home to ensure their safety.

It was found that (36.7%) of the subjects practice of self-care activities was poor. This could be because of fatigue and frailty in the elderly. Many of the elderly found it difficult to carry out their self care activities, and this had a bearing on how they perceived their health and functioning. It could also be that they did not receive much assistance from their family to wash their clothes, and for other self care activities. Analysis showed an association between self-care activities and health and functioning demonstrating statistical significance (p=0.05) showing that improvement in self-care activities does have a bearing on the health and functioning of the elderly.

There was no association noted between sleep and relaxation and the QOL domain of health and functioning. Many subjects mentioned to the investigator that they found it hard to relax and were unable to take short naps during the day, due to the family situation and noise

made by the younger grand children. They also reported that they do not enjoy watching TV since the programs are more suited to the younger generation.

Chemoprophylaxis and health and functioning showed significant (p= 0.019), association. Harari and colleagues (2008) (67)found similar results in their trial which evaluated the effect of health behavior and preventative-care uptake in older people in NHS primary care. Intervention group respondents reported slightly higher pneumococcal vaccination uptake and equivocal improvement in physical activity levels compared with controls.

In the aspect of secondary prevention and health and functioning, no association was noted. In the responses to the questionnaire, some elders mentioned that they were discouraged from attending medical camps as the “doctors were busy with examining pregnant mothers and children”. Some reported that even though they suffered from diabetes and hypertension, they did not have regular checkups, or follow up investigations. However, they reported that the village health nurse and health aid encouraged them to attend the morbidity clinics that were conducted once a month in their area.

Social/Economic: Analysis of the association between HPP and the QOL domain of social / economic showed that among the health promotion practices, diet (0.004*) has significant association while exercise (0.001**) and self-care activities (0.001**) have highly significant association that has reached statistical significance with social/economic domain of QOL at $p< 0.05$ and $p< 0.001$ level respectively (Table 4.5.2).

In the aspect of diet, a large number of subjects (47.1%) have poor diet intake and poor QOL. The reasons for this may be due to lack of awareness of nutritious food and the ability to spend on food. The elders hesitantly shared with the volunteer that on many

occasions they have gone to bed on an empty stomach because the food that was cooked would not be sufficient for all the members of the family. They also stated that there was no one who “really cared about whether they were satisfied or had enough food”. The other reason as identified was that many of the elders did not have financial independence to spend for their needs.

Many elders had poor exercise (46%) and voiced that they would enjoy going for short walks and doing simple exercises if they had company. Some of them voiced the concern that if they trip and fall, “there would not be anyone to take care of them”. So they preferred to sit around and do nothing in particular therefore their QOL was poor.

Regarding injury prevention it was surprising to note that 25 (28.7%) of the subjects who had good injury prevention, reported poor QOL. This could be due to the experience of loneliness they reported, in spite of having a safe environment to live in.

The poor QOL of subjects who practiced both poor and moderate self-care activities was a reflection of the way the elderly perceived being independent to care for self and in spite of their frailties were expected to care for the grandchildren. Some elders voiced that they were not given detergent to wash clothes, also soap for their bathing purposes.

No association was noted in the aspect of sleep and relaxation, chemoprophylaxis and secondary prevention.

Morag (1995)(120)demonstrated not only that older people can talk about, and do think about, quality of life, but also highlighted how quality of life varies for different age groups of the elderly population living at home, in different geographical areas. In addition, early conclusions also indicated that there was more to quality of life than health: indeed, social contacts appear to be as valued components of a good quality of life as health status.

Psychological and Spiritual: Analysis of the association between the health promotion practices and the QOL domain of psychological and spiritual noted significance for diet, self care activities and secondary prevention, while there was no significance noted for exercise, injury prevention, sleep and relaxation and chemoprophylaxis (Table 4.5.3).

For diet 38 (46.9%) of the subjects scored poor in HPP and QOL, while 22 (33.8%) subjects who had poor diet scored good in the QOL domain. Subjects who scored good for diet 13 (16%) scored poor for QOL. This was because the elders were found to have various superstitious beliefs in relation to many food items and so avoided these foods. Some of them reported that they did not feel like eating due to various 'tensions' in the home.

It was noted that 29 (35.8%) of the subjects scored poor in self care activities and psychological and spiritual domain, while 7 (10.8%) of the subjects scored good in both aspects. This according to them was due to the fact that they faced a lot of psychological stress to the extent that a few of them verbalized that they were "being punished by God for some fault they must have done in their previous birth". This probably led them to have poor QOL in the psychological and spiritual domain.

The findings for secondary prevention indicated that 32 (39.5%) of the subjects scored poor, 38 (46.9%) scored moderate in this QOL domain. Overall it was found that 81 subjects scored poor in both aspects. This shows that more than half of the elders (55.47%) were psychologically and spiritually unsatisfied with their lives in relation to secondary prevention where they needed to dependent on their family members take them to the doctor for regular checkups and follow up investigations.

Penninx (2000) (94)in his study stated the protective effect of a positive attitude on physical health and mental performance may work in a variety of ways. Positive emotions

can increase confidence in performance capacity, strengthen social support, stimulate motivation for self care and encourage more physical activities that lead to higher level mental and physical functioning.

Family: Findings related to the association between HPP and the domain of family demonstrated significance for diet, exercise, chemoprophylaxis and secondary prevention (Table 4.5.4).

In relation to diet 43 (54.4%) scored poor in both aspects while 12 (15.2%) of subjects who scored good in diet were found to be poor in QOL. The reason could be that some did have adequate food, but family support was lacking. On the other hand some elders reported that they would not be given soft, tasty food, but would be forced to eat either too bland (whatever prepared for the grandchildren) or too spicy for their taste.

In the aspect of exercise and family 37 (46.8%) of the subjects fared poor in both aspects while 13 (19.4%) of subjects scored good in both aspects. It was clearly seen that the elders did not receive adequate love and respect from the families. Some elders reported being left alone while the family went for outings or on vacation, so since they were alone, they were not confident to go out.

Injury prevention, self care activities and sleep and relaxation did not show any significance, but going by results in the other domains, the elders are not satisfied with their home environment. Many hesitantly broke their silence regarding the physical and verbal abuse that they faced. The prevalence of this scourge is very high in the rural areas, but is out of the purview of this study. However, it plays a definite underlying role on the quality of life of the elderly.

In conclusion,it is found that the health of elders is not given priority in the family. In spite of all the problems they face, it is also true of Indian rural families, that they will not openly speak ill of their families.There was a paucity of research studies that reported on the association of HPP and QOL.

5.6 Association between health promotion practices and selected demographic and socio-economic variables

The fifth objective was to identify association between HPP and selected demographic and socio-economic variables among the elderly.

The demographic and socio-economic variables selected for association were age, sex, education, marital status and financial stability.

Diet: Findings indicated that there was significant association of Health promotion practices of diet with demographic and socio- economic variables such as sex (0.030*), education (0.028*), financial stability (0.006*) and highly significant association with the marital status (0.000**), all reaching statistical significance at *p < 0.05, **p < 0.001 levels (Table 4.6.1). Thus we find that with a difference in the proportion of sex, levels of education, marital status and financial stability there is also a difference in the diet practices of the individuals which has reached statistical significance.

Exercise: There was significant association of the Health promotion practice of Exercise with demographic and socio-economic variables such as marital status (0.007*), and highly significant association with age (0.000**), education (0.000**) and financial stability (0.000**), all reaching statistical significance at *p< 0.05, **p < 0.001 levels (Table 4.6.2). Thus we find that with a difference in the proportion of subjects with different age, levels of education, marital status and financial stability there is also a difference in the practices of

exercises among the subjects, which has reached statistical significance. Part of the findings were supported in a study by Center for disease Control and Prevention. Behavioral risk factors surveillance system 2004(142) 60% of adults did not achieve the recommended amount of physical activity, 25% were not physically active at all, 36% engaged in no physical activity – inactivity increased, with age and was more common among women and people in the lower income. By the age 75, 36% engaged in no physical activity.

Injury prevention: In relation to association of injury prevention with selected demographic and socio-economic variables, association of demographic and socio- economic variables such as sex (0.026*) and marital status (0.013*) reached statistical significance at *$p < 0.05$ level (Table 4.6.3). Here we find that with a difference in the proportion of subjects with different sex, and marital status there is also a difference in the practices of injury prevention among the subjects, which has reached statistical significance.

Self-care activities: In relation to self-care activities, significance was noted for demographic and socio-economic variables such as age (0.023*), education (0.027*) and financial stability (0.041*), and highly significant association with sex (0.000**), all reaching statistical significance at *$p < 0.05$, **$p < 0.001$ levels (Table 4.6.4). A difference in the proportion of subjects with difference in age, levels of education and financial stability there is also a difference in the practice of self-care activities among the subjects, which has reached statistical significance.

Sleep and relaxation: In regard to sleep and relaxation, significance was not noted in age, education and financial stability, while there was significant association with demographic and socio-economic variables such as sex (0.022*) and marital status (0.046*) reaching statistical significance at *$p< 0.05$ level (Table 4.6.5). This shows that a difference in the proportion of subjects belonging to different sex, and marital status there is also a difference

in sleep and relaxation among the subjects, which has reached statistical significance. The reasons for these findings will need to be further researched into as there is a paucity of research in the field.

Chemoprophylaxis: In regard to HPP of chemoprophylaxis statistically significant association was found with the demographic and socio-economic variable of education (0.045*) at $*p < 0.05$ level (Table 4.6.6) while the other variables did not show any association. This shows that with a difference in the proportion of subjects belonging to different levels of education there is also a difference in the practice of chemoprophylaxis among the subjects, which has reached statistical significance.

Secondary prevention: There was no association found in relation to secondary prevention and the demographic variables of age, sex, education, marital status and financial stability (Table 4.6.7). In every variable however, the number of subjects who scored poor was more than those who scored good leading the investigator to conclude that all efforts should be directed by legislators and health care personnel towards ensuring that those subjects with potential risk of disease should be screened regularly to detect disease at an early stage. Home based exercise programs result in significant fall reduction and related benefits. One individually tailored exercise program in the home improved physical function, reduced falls, and decreased injuries in a sample of women aged 80 years and older. Over a one-year period, persons in the exercise programs reduced falls by 46% compared with a control that received an equal number of social visits (71).

Ferrini and colleagues (1994) (87) examined the association between health beliefs and health behavior (diet, exercise, and an individual's willingness to spend money on 'healthful' items) change in older adults. The study found that respondents who expressed

positive beliefs about the behaviors were more likely to report positive changes in health behavior.

5.7 Association between quality of life and selected demographic and socio-economic variables

The sixth objective was to find association between baseline QOL and selected demographic and socio-economic variables among rural elderly.

Association was studied between the four QOL domains and selected demographic and socio-economic variables.

Health and Functioning: In the first domain of health and functioning, no significance was noted for age, sex, marital status and financial stability but there was an association with the demographic and socio-economic variable education (0.038*) reaching statistical significance at $P < 0.05$* level (Table 4.7.1). This shows that with a difference in the proportion of subjects belonging to different levels of education there is also a difference in the QOL domain of health and functioning among the subjects, which has reached statistical significance. Education emerges as a major factor in determining the quality of life than an elder enjoys.

Social / Economic: There is association between baseline QOL in Social-economic domain and the demographic and socio-economic variables like sex (0.041*) and marital status (0.015*) reaching statistical significance at $p< 0.05$ level (Table 4.7.2). With a difference in the proportion of subjects belonging to different sex and marital status there is also a difference in the QOL domain of social /economic among the subjects, which has reached statistical significance. Findings show that married subjects fared better in this domain as they had someone to fall back on, whereas widowed subjects may not have received the

support they needed. These inferences were drawn from the many conversations that the investigator had with the subjects, and also their responses in the questionnaire.

Psychological and Spiritual: There is no association of baseline QOL in psychological and spiritual domain with any of the demographic and socio-economic variables such as age, sex, education, marital status and financial stability (Table 4.7.3). Spirituality is a highly personal issue among rural South Indians who have strong faith in their religious beliefs.

Family: There is statistically significant association of baseline QOL in family domain with demographic and socio-economic variables such as age (0.046*) and marital status (0.002*) at $p< 0.05$* level.Sex, education and final stability did not show any significance since these factors seemed to have little influence on perceptions on QOL in relation to family (Table 4.7.4). The investigator came across much discord among the subjects due to misunderstandings between spouses, between children and in-laws, which could be the reason for these findings.

Study findings of **Thomopoulou (**2010)(116)supported this study. He reported that males had higher QOL scores(M=20.84,+ - 1.15,p=.05) than females (M= 18.77+ - 1.78,p=.05),old(60-74 years M= 21.03 + -1.44, p=.05) had higher scores than oldest old (>75years M=19.04,+ - 1.55, p= .05) and married subjects had higher scores(M= 20.77,+ - 1.45) than widowed persons (M==18.89,+ -1.72) but with no significance.

Van Minh (2011)(123)reported that in rural Vietnam and Indonesia, the QOL was higher among (i) men; (ii) people with higher education; (iii) people who were in a marital partnership; (iv) people who lived with other family members; and (v) those with higher economic status, compared with that in those of other category(ies) of the same characteristic. In Vietnam, people who belonged to the second to fifth economic quintiles and had more than 6 years of education were sevenfold more likely to report very good/good quality of life

compared with those who belonged to the first economic quintile (poorest) and had no formal education.

Conclusion: In conclusion, the study revealed that the experiment and control group subjects were homogenous. The prevalence of HPP among the rural elderly had majority of subjects in the poor category (39.9%), with 37.4% of subjects in moderate and a smaller percentage of 22.7% in the good category. This poses a challenge to community health personnel to ensure that the rural elderly are empowered to follow positive health promotion practices to ensure a healthy and happy life. Data in relation to the QOL perceived by these elders demonstrates that there are lacunae in all the four domains that were assessed – health and functioning, social and economic, psychological and spiritual and family. The efficacy of the MCI on the QOL indicated that the experiment subjects who received the MCI reported much higher QOL when compared to the control group, who began to show a decline in their QOL from the pre-intervention stage. Thus, the simple, user-friendly, sustainable and enjoyable intervention can easily be replicated by government, non-government organizations and the local community, so that our elders enjoy a better quality of life. The study had three hypotheses:

1) There was a significant association between HPP and QOL among the elderly. The finding show that most aspects of HPP for diet, exercise, activities of daily living, chemoprophylaxis and secondary prevention had association on various QOL domains of health and functioning, psychological and spiritual, social/economic and family. Thus the hypothesis was accepted. Further calculations revealed a weak cor-relation between certain health promotion practices and some of the QOL domains. However this aspect was outside the purview of the present study and hence findings were not included.

2) There was a significant improvement in QOL among elderly receiving the MCI as compared to the elderly who did not receive the intervention as elicited from the Ferrans' and Powers' QOL Index Version III. The findings showed that in all the four QOL domains, there was high significance at $p<0.000$, proving that the MCI made a big difference in how the elders QOL, as compared to those who did not receive the MCI. They also voiced better appetite, sleep, frame of mind and ability to cope with stress, anger and disappointment. This hypothesis is also accepted.
3) There was a significant association between QOL and HPP with selected demographic and socio-economic variable. The selected variables that were used for association was age, sex, education, marital status and financial stability. There was association with HPP for diet, exercise, injury prevention, sleep and relaxation and chemoprophylaxis. QOL also demonstrated association with selected demographic variables. Thus the hypothesis is accepted.

LIMITATIONS

- The enthusiasm and motivation of the village volunteer could influence the participation of the elders at the study centre.
- Quality of life is subjective and depends upon circumstances under which the questionnaire was applied.
- Responses to questions relating to health promotion practices would not have reflected the actual situation.
- HPP Questionnaire was not administered post MCI, since it was felt that HPP of the elder was strongly influenced by family. Further, 6 months was too short to change health practices that were followed by the family.
- The study was not blinded.

- The physical and mental health of the subjects could have positively or negatively influenced the responses of the elderly.
- The environmental and social milieu of the close knit community could have influenced the responses of the elderly.

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CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1 SUMMARY

Population ageing has emerged as the great challenge of this century. In our society, by tradition, care of the elderly has been the responsibility of family members and provided within the family home. However, these traditional care arrangements have been lost in the context of rapid urbanization and an exodus of people from rural to urban areas and from urban areas to foreign countries. Decreasing family size, geographical dispersion of families, educated women who work outside home, greater life expectancy are some the reasons attributed to this.It appears that many States do not have the welfare of senior citizens on their agenda. In the absence of such community support in the form of family or need-based services, the elderly are often rendered destitute, if not financially, from a pragmatic perspective.

The present study was undertaken to gather pertinent information regarding the existing health promotion practices and the quality of life of the rural elderly before and after a multi-component intervention strategy. Sparse information has been published so far, on the above issues. This study was conducted in six villages of Kaniyambadi block of Vellore

district. Three of the villages were randomized to experiment group and another three villages as control and the estimated sample size was obtained from these six villages. Duration of the study was from June 2011 to January 2012. The Conceptual Frame Work that directed the study was modified Miller's Functional Consequences for Wellness in Older Adults.

The study participants in the six villages, who fulfilled the inclusion criteria, were selected using Total Enumeration Technique after the villages were randomized. A total of 146 subjects willingly participated in the study; seventy three in the experiment group and 73 in the control group. Elders in the experiment group received the multi-component intervention strategy for a period of 6 months. Instruments utilized in the study included:

a) **Health Promotion Practice Questionnaire**
b) **Ferrans' and Powers' Quality of Life Index Generic Version III**
c) **Multi-Component Intervention Strategy**

Demographic characteristics between the experiment and control subjects demonstrated that the groups were homogenous.

6.2 SIGNIFICANT FINDINGS OF THE STUDY

The major findings noted among the sample size of 73 elders each in experiment and control group, in relation to demography of the study population, majority 121 (82.9%) were above the age of 65 years. Females were more than the males 85 (58.2%) and majority 139 (95.2%) were from Hindu religion. Present occupational status shows that 57 (39%) were not working and only 5 (3.4%) were financially independent. Those married were 95 (65.1%) while 68(46.6%) lived with their children. Unschooled formed the majority with 94 (64.4%) subjects. BMI in the optimal range of 18.5 – 24.9 was noted in 70 (47.9%) of the elders.

Regarding the HPP status among the rural elderly, it was noted that those who scored poor for diet were 60 subjects (41.1%), mild to moderate exercise was seen in 70 (47.9%), 43 (29.5%) had good home environment injury prevention, 64 (43.8%) had poor sleep and relaxation 69 (47.3%) scored poor for chemoprophylaxis, while 52 subjects (35.6%) scored poor for secondary prevention.

On analyzing the QOL among the experimental and control group, it was noted that in pre intervention, there was association noted in the domain of health and function (p = 0.019), significant at p <0.05 level, while in the post intervention, there was association noted in all four domains viz. health and function(p value 0.000), psychological and spiritual(p value - 0.000), social and economic(p = 0.000)and family(p = 0.000), all denoting highly significant at p <0.001 level.

The efficacy of the MCI on the QOL of the experiment and control group showed highly significant (p = 0.000) in the experiment group, with a mean change of -5.713. (Mean pre 11.69 and post 17.40). Mean change of 0.413 was noted in the control group mean pre(12.76 & post 12.35) which was not significant.

The association between HPP and QOL among the elderly denoted that there was association seen with chemoprophylaxis (p = 0.019) significant at p <0.05 level, in the QOL domain of health and functioning. In the psychological and spiritual domain, there was association seen for diet, (p = 0.025), activities of daily living (p+0.004) and secondary prevention (p+0.004), all showing significance at p <0.05 level. In the social/economic domain, association was noted for diet (p = *0*.004), and exercise (p = 0.001) activities of daily living (p = *0*.001), showing significance at p <0.005 level. In the domain of family, there was association for diet (p = 0.001) exercise (p = 0.034), chemoprophylaxis (p = 0.000)

and secondary prevention (p = 0.001) were found to be highly significant at (p <0.001) level, while exercise was significant at p <0.05 level.

With regard to association of HPP in the primary prevention of diet with demographic and socio-economic variables, there was association for sex (p = 0.030) education (p = 0.028) and marital status (p = 0.000). For exercise, association was noted with age (p = 0.000), education (p =0.000) and financial stability (p = 0.000), all highly significant at p <0.001 level. For injury prevention, there was association with sex (p = *0*.026) and marital status (p = *0*.013) both significant at p <0.05 level. Self-care activities showed association with age (p = 0.023), sex (p = 0.000) and education (p = 0.027) and financial stability (p = 0.041). All except sex were significant at p <0.05 level. Sleep and relaxation showed association with sex (p = 0.022) and marital status (p = 0.046), both significant at p <0.05 level.

Chemoprophylaxis showed association with education (p = 0.045), significant at p <0.05 level. No association was noted for secondary prevention with the demographic and socio-economic variables.

Association of QOL with demographic and socio-economic variables demonstrated that there was association in the domain of health and functioning with education (p = 0.038).There was no association in the domain of psychological and spiritual. In the domain of social/economic, association was found with sex (p=0.041) and marital status (p = 0.026), in the domain of family, there was association noted for age (p = 0.046) and marital status (p = 0.002), both significant at p <0.05 level.

6.3.1 IMPLICATIONS FOR NURSING PRACTICE

The findings of this study will serve to convince nurses that providing nursing care to older persons is a satisfying, rewarding and a life-affirming vocation. The older adult comes with varying needs and problems. As carers, nurses need more understanding and sensitivity towards the elderly. Nurses should strive to be a source of never-ending support to the elderly and make their growing older a welcome time of their life. Nurses should equip themselves with the necessary and updated knowledge and skills in geriatric practice and gerontology. They would do well to sharpen their assessment skills, be able to formulate appropriate nursing diagnoses, implement safe interventions and evaluate the outcomes both, in clinical and community settings. Nurses should have the confidence to take on the role of a team leader and thus be looked upon as trusted health educators by the older adults, their families and care givers in the hospital and community, at large. Nurses should be empowered to uphold the high ideals to which the profession adheres to, and maintain the highest standards of quality care for older adults, at all times. Nurses should be the forerunners in the war against diseases among the elderly, and actively participate in chemoprophylaxis and immunization drives, specially targeting the elderly. Nurses should take their rightful place in the arena of health promotion and do their part for a healthy world especially for the older adult. It is not the length of years that matter in a person's life, but the quality of those years. India's elderly have a lot to be done for them. Let us nurses lead the way.

6.3.2 IMPLICATIONS FOR NURSING EDUCATION

This study highlights the need for emphasizing health promotion as opposed to knowledge and treatment of illnesses, which is the aspect that seems to enjoy the most importance in the Nursing curriculum. If any person, more importantly an older adult can be helped to live a healthy and satisfying life in his / her own environment, then the profession

has achieved its goal of health promotion. Care of older adults is based on the specialty body of the knowledge of Gerontologic and Geriatric nursing, where the nurse approaches the patients with a whole-person perspective, which is inclusive of all domains – physical, psychological, social, economical, environmental and spiritual. All nurses should be encouraged to attend continuing nursing education series that deal with specific topics related to Geriatric and Gerontological nursing. It should be mandated for nurses to upgrade their knowledge and skills in the care of the elderly and be specially licensed to care for them.They should be made familiar with the demography, epidemiology, morbidities, treatment and prevention strategies of the illnesses that tend to plaque the older adults. By virtue of their knowledge, skills and experience, nurse educators can get involved in policy making at local and national levels, and ensure that the older adult receives the necessary health care and services that are due to them. Nursing students should receive experience of caring for the elderly in their familiar surroundings. They should be encouraged to initiate creative and enjoyable interventions that will ensure a good quality of life for the elderly in the community.

6.3.3 IMPLICATIONS FOR NURSING RESEARCH

The investigator has noted that there is a paucity of medical and nursing research and published articles from India in relation to the fields Gerontology and Geriatric medicine and nursing. Advanced countries including USA, UK and Europe have been studying older adults since the early 1930's. But for a few studies from Bangladesh, there is very little published research from other Asian countries. Thus, high quality nursing research in India in this field can be a challenging task and is the need of the day. Lack of medical and nursing research has led to this vulnerable group not receiving the care and assistance that is due to them. Many of the western study findings may not be applicable to the Indian population, because

of differences in geography, demography resources and health perspectives. Research findings in the elderly Indian population will serve to sensitize government, non-government agencies, religious groups, communities and families to the needs of this special group. Evidence-based information can also augment the services of those who lobby for the rights and privileges of the elders. It can serve to challenge all health care professionals to understand the unique needs of these persons, to overcome their ageist attitudes and treat the elderly with patience, respect and compassion. Research can also improve elder care protocols with more emphasis on preventive and promotive health. Research findings can serve to empower the elderly who will then be able to take their rightful place in society and not be relegated to the periphery of society, as many of them currently are.

6.4 RECOMMENDATIONS

The study findings reveal that over all a larger majority of rural elderly had poor health promotion practices. Quality of life among the experiment and control group indicated that post intervention QOL was significant higher in the experiment group which received the MCI, thereby also proving the efficacy of the MCI. Hence the following strategies are recommended.

1. Elder care education in relation to health promotion to be strengthened in the rural areas.
2. Elder day care centers to be started in all villages where the elders will have opportunity to exercise, improve knowledge on health awareness, enjoy the support of peers and share their successes in different aspects of living
3. Government to provide a noon-meal scheme for elders on the lines of the scheme for school children.
4. Government to organize prophylactic immunization for elders.

5. Regular home visits to the elderly who are diagnosed with co-morbidities.
6. Community health nurses to organize for follow up visits, investigations and check compliance of the elder to prescribed medications.
7. Counseling services to be offered and help line specifically for elders to be activated.
8. Media to allocate one prime time slot per week to emphasize on issues of the elderly in India.
9. Effective partnerships between family, community, non Government organizations and Government to ensure that the elderly live a life of dignity, peace and fulfillment.

6.5 SUGGESTIONS FOR FURTHER NURSING RESEARCH

The current study could be taken forward since there is a paucity of research in the field of Community Geriatrics and Gerontology in the Indian scenario. This can be addressed by conducting research under the following broad topics.

1. Cross sectional studies on Health promotion practices among the elderly in India.
2. Caregivers' perception of the need for health promotion among the elderly.
3. Meta analysis of Indian studies in relation to Health promotion among the healthy older adults cared for at home.
4. Factors that define the health seeking behaviors of elderly in India.
5. Role of chemoprophylaxis, screening immunization in disease prevention among the elderly in India.
6. The influence of physical and mental health in older adults' participation in primary and secondary health behaviors.
7. Longitudinal studies on home and environment as a positive indicator of safety in older adults.

8. Mass screening for nutrition, vision and hearing among rural elderly and its financial implications for national policy.
9. Correlational studies to evaluate sustainable strategies to enhance health promotion behaviors among the elderly in rural and urban settings.
10. Factors that contribute to successful aging in India
11. Young adults' knowledge and attitude towards aging.
12. Quality of life of the elderly as perceived by caregivers, legislators and policy makers
13. Extent and Effect of family support on the quality of life of the elderly at home
14. Efficacy of a community based intervention strategy on the quality of life among elderly in various regions of India with a view to policy changes.
15. A cross sectional study on Elder Abuse – a myth or reality in India.
16. Efficiency of existing public health initiatives in mitigating the needs of elderly in India.
17. Are old-age homes here to stay – perspectives of Indian legislators, media, family members and older adults.
18. Qualitative studies on Quality of life of the elderly in India.

CONCLUSION

Healthy behavior is the key to successful aging, which in turn, is determined by the life style choices of individuals(42). Healthy aging includes biological, psychological, social, spiritual, cultural and environmental factors(143).Optimal health in old age is the product of a matrix of factors. Therefore, health promotion has a wider remit, aiming not only at avoiding disease but also at assisting the personal development of the elderly, toward better understanding and control of their own health and toward positive well-being. Thestrategy is to focuson inter-sectoral approach outside the traditional health arena(144). The investigator has realized that this study has provided lucid evidence regarding the benefit of a health-promoting intervention strategy, to augment the quality of life of the rural elderly.

The elder citizen is a national treasure; one who has contributed to both national growth and familial development. As they approach the autumn of their lives, they experience diminishing ability to generate income, increasing vulnerability to illness and disability, increasing dependency on their families and communities. Rather than view this dependence as a burden to be endured, we must as a society, embrace them whole-heartedly, as a payback opportunity; to thank senior citizens for their unconditional contributions.

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