

**EFFECTIVENESS OF SELECTED NURSING INTERVENTION
IN IMPROVING FUNCTIONAL STATUS AMONG ELDERLY
WITH IMPAIRED MOBILITY**



**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R.
MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN NURSING**

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**AN EXPERIMENTAL STUDY TO EVALUATE THE
EFFECTIVENESS OF SELECTED NURSING INTERVENTION
IN IMPROVING FUNCTIONAL STATUS AMONG ELDERLY
WITH IMPAIRED MOBILITY RESIDING IN SELECTED OLD
AGE HOMES IN MADURAI.**

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CERTIFICATE

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ABSTRACT

This study intended to be an experimental study to evaluate the effectiveness of selected nursing intervention in improving functional status among elderly with impaired mobility residing in selected old age homes in Madurai. An experimental approach was used for this study. The design adopted for the study was Quasi Experimental pre test post test control group design. Purposive sampling technique was adopted for this study. The sample consisted of 60 patients, in that 30 were in Experimental group and 30 were in Control group. The experimental group was instructed to do the selected therapeutic exercise for 20 days and the control group was treated with routine care. The tool used for data collection procedure was Functional activity index scale. Both descriptive and inferential statistics were used for the analysis of data. The major findings were, before administration of therapeutic exercises in experimental group 30 sample (100%) were partially dependent. But after administration of therapeutic exercises 23 samples (76.66%) were become independent and 7 (23.33%) sample belong to partially dependent group where as in control group in pre and post test 30 (100%) samples were in partially dependent (100%) category. The mean functional activity score of experimental group 46.30 after administration of therapeutic exercise on day 20 is higher than mean functional activity score 33.56 before administration of therapeutic exercises. The obtained 't' value is 10.19 which was significant at 0.05 level df (58). There was no association between the functional activity score of the subjects with selected demographic variables like age, sex, education status, co-morbid diseases, body mass index and previous history of fall and fracture. The study concludes that the selected therapeutic exercise found to be effective in improving functional status among elderly with impaired mobility residing in selected old age home in Madurai.

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CHAPTER – I

INTRODUCTION

BACKGROUND OF THE STUDY

“I truly believe that age – if you’re healthy – age is just a number”

-Hugh Hefner

A man's life is normally divided into five main stages namely infancy, childhood, adolescence, adulthood and old age. In each of these stages an individual has to find himself in different situations and face different problems. The old age is not without problems. In old age physical strength deteriorates, mental stability diminishes; memory power becomes bleak coupled with negligence from the younger generation. There are 81million older people in India- 11 lakh in Delhi itself. (Yuman Hussain, 2000)

A number of known physiological changes occur with aging, including reduced muscle strength, aerobic capacity, vasomotor instability, baroreceptors insensitivity, reduced total body water, reduced bone density, reduced ventilation, and reduced sensory capacity. Comorbid conditions and chronic illness may heighten these changes. Muscle mass and muscle strength are reduced with aging and contribute to a reduction of physical activity. With aging, alterations in autonomic function, including baroreceptor insensitivity, occurs. Age-associated reduction in body water and plasma volume may predispose the elderly to syncope. Respiratory mechanics are also altered with aging, with reduced ventilation, increased residual capacity, and reduced arterial oxygen tension. Other age-associated changes include reduced bladder capacity and increased urine production, prostate enlargement, bone

demineralization, loss of taste and smell, decreased skin integrity, and reduction in sensory input. [accessed from [www,Wikipedia.org](http://www.Wikipedia.org) on 7-8-2011]

It is estimated that up to 8 percent of community-dwelling elders need assistance with one or more ADLs. Among those age 85 and older, the percentage who live at home but need assistance or who live in a nursing home increases significantly to 56 percent of women and 38 percent of men. Chronic illness and comorbidities can directly impact functional status in the elderly. Chronic health care conditions that are most prevalent in the elderly include heart disease, hypertension, arthritis, diabetes, and cancer. Acute illness due to chronic disease and chronic comorbidities accounts for a significant number of hospitalizations in the elderly. [accessed from www,Wikipedia.org on 7-8-2011]

The percentage of elderly people in the United States stood at 12.6% in 2000, compared with only 4.1% in 1900 and a projected increase to 20% by the year 2030. The elderly population has grown proportionally faster than any other age group in Brazil . In 2020, when life expectancy will have reached 75.5 years, the Brazilian population will consist of an estimated 23.5 percent young people (aged 18 or younger) and 7.7 percent, an estimated 16.2 million, the elderly (aged 60 or older) . As the population ages, a trend of health problems and functional disability increases, with a significant impact on rehabilitation service needs, such as home care and nursing homes, especially for those aged 85 and older . In the United States, approximately 5 percent of the elderly are institutionalized, and this statistic is unlikely to decline in the coming years. As a result, the demand for long-term care institutions for the elderly will increase. (Paul Demeny, 2003)

The proportion of the elderly in the total population also raised from 5.63 per cent in 1961 to 6.58 per cent in 1991 and to 7.5 per cent in 2001. India has thus joined the rank of “Greying nations” with over seven per cent of its population in the 60-plus years segment. A United Nations report has predicted that India will have 198 million ‘Old’ (60+) people in 2030 and 326 million in 2050. Currently, there could be around 100 million ‘senior citizens’ in India. (The Hindu, Sep,22.2010)

The number of persons above the age of 60 years is fast growing, especially in India. India as the second most populous country in the world has 76.6 million people at or over the age of 60, constituting above 7.7% of total population. The problems faced by this segment of the population are numerous owing to the social and cultural changes that are taking place within the Indian society. The major area of concern is the health of the elderly with multiple medical and psychological problems. Falls are one of the major problems in the elderly and are considered one of the “Geriatric Giants”. The loss of functional mobility has been shown to be associated with 50 percent mortality rate among nursing home patients within 6 to 12 months. This decline in physical functionality is due only partly to the aging process, and to a large extent, it is due to the decrease in or lack of physical activity. (B. Krishnaswamy, 2010).

Projected increases in both the absolute and relative size of the elderly population in many third world countries is a subject of growing concern for public policy (Liebig and IrudayaRajan ,2003).

The aging process does not cause impaired mobility. Several predisposing factors in addition to age-related changes can lead to impaired mobility. Chronic disease, sedentary life style, smoking, malnutrition/weight loss, visual impairment,

hearing loss, cognitive impairment, urinary incontinence, depression, physical disability, and reduced leg mobility are thought to have many detrimental effects on function as the aging process itself .(Moore,2007)

Two basic levels of functional ability are recognized. The most basic Activities of daily living in the areas of personal care and mobility (e.g., eating, bathing, dressing, using the toilet, and transferring from bed or chair) are distinguished from more complex role activities, such as taking medication, managing money, and grocery shopping, which have come to be known as instrumental Activities of daily living (IADLs). The instrumental Activities of daily living are more heterogeneous than Activities of daily living, and include activities necessary to live independently in the community, such as using a telephone, taking medications, managing money, grocery shopping, meal preparation, shopping, light and heavy housework, doing laundry, using local transportation, and remembering appointments. (Scott Miyake Geron,2010)

Lack of functional capacity in each Activities of Daily Living or instrumental activities of daily living task can result from any combination of physical problems, memory loss, lack of social resources, or lack of motivation (e.g., because of depression). Thus, when trying to improve someone's functional ability for example. Cooking, one could attempt to change any of these parameters. If memory loss is the reason for functional impairment, some people might be able to perform the function with cueing and reminders. Sometimes people become more functional when a task is simplified. Sometimes physical rehabilitation or provision of a wide range of prosthetic aides (dentures, hearing aides, canes, or specialized equipment) improves functional abilities. The variation in the amount of human help needed to become

functional on any given task can be considerable, ranging from just stand-by assistance for safety to the physical help of two or more people. (Rosalie a. Kane,2000)

Exercise is an accessible form of prevention of physical decline. Several studies have found that adherence to a regular exercise program can improve muscle strength reaction time, balance control and gait velocity significantly. Also some trial evidence has shown that exercise programs may enhance cognitive performance and effective states of the elderly as well , mainly of frail institutionalized elderly, given their lack of exercise and life stimuli [Alessandra, Bastone and Filho,2004]

Peat, Mccarney and Croft (1998) said that nursing assessment requires a holistic approach. Physical, mental, emotional, spiritual, social and economic status must be assessed. The rehabilitation nurse focuses on coping patterns, functional ability assessment is one of the important focus on the self care, feeding, bathing, grooming, dressing, toileting and mobility, functional ability depends on good joint movement muscle strength and an intact neurologic system. Disabilities most likely to produce loss of function are those involving the musculoskeletal disorders. Secondary problem related to the disability, such as muscle atrophy and deconditioning that may affect functional ability. The nurse notes the patient's ability to move and his coordination and endurance.

SIGNIFICANCE AND NEED FOR THE STUDY

The present and future of our society are characterized by an increase in number and proportions of old and very old people. This concerns and worries both the aging individuals themselves and health care planners in the society. The aging individuals worry about declining intellectual abilities and physical health. The

changing demographic patterns are also coupled with worries that society may have to struggle with in order to deal with difficult issues such as the financial burden of providing for old age, increasing demands on social and medical care, growing needs for assistance and care in cases of disability. (Kirsten avlund 2004)

The growth in the aged population has been 40% between 1991 and 2001. The population of people above the age of 60 years is expected to grow from 7.6 million in 2001 to 100 million in 2013 and 136 million in 2021. (The Hindu, Nov 23.2010)

The family is often a cold place for senior citizens in the Capital. A study by the charity HelpAge India has found that the city has the worst record in the country so far as familial abuse of the elderly is concerned. Its report claims that abuse by daughters-in-law, verbal abuse, and financial dependency are common problems faced by octogenarians here. At the same time, community support and healthcare schemes for the elderly are lacking. "Senior citizens are no longer a homogenous group of people over 60 years of age. With growing life expectancy, there is a large chunk of the population that is over 80, which poses different challenges. (The Times Of India Delhi, October 2, 2011)

Falls and related injuries among elderly people are a major public health problem worldwide; falls are the leading cause of unintentional injury and death in these individuals and are also responsible for appreciable morbidity, including bone fracture, pain, functional impairment, disability, fear of falling and admission to a long-stay facility. Furthermore, the problem is likely to increase, because the number of elderly people, and their mean age, is increasing everywhere and because there are clear signs that the age-adjusted incidence (that is, the average individual risk) of fall-induced injury is also rising. (Kannus, and Khan 2001)

In view of the rising aging population, there is now a need to consider special needs of the elderly particularly in the aspect of health care delivery, besides managing the common physical illness that is common among the elderly such as diabetes mellitus, Hypertension, ischemic heart disease and cancers, one must not forget problems pertaining to social environment, which need to be addressed as well. One of the areas, which is absolutely important but yet frequently neglected, is how well the elderly can maintain and take care of themselves. Age should not be a hindrance factor towards physical activities of the elderly (k.y.loh,2006)

Elderly people with high levels of habitual physical activity live longer and have better general health and higher levels of wellbeing than do those who are inactive. Improving activity levels may improve health outcomes. Even small gains in functional status may result in significant benefits in functional performance and quality of life. (Kerse et al., 2008)

As the aging population is increasing and functional inability creates a problem for both the elderly and the society, it is necessary to make them independent as far as possible. To improve their functional status and decreasing their dependent role on others and to decrease the risks of accidents, the researcher had undertaken the study.

STATEMENT OF THE PROBLEM

An experimental study to evaluate the effectiveness of selected nursing intervention in improving functional status among elderly with impaired mobility residing in selected old age homes in Madurai.

OBJECTIVES

1. To find out the functional status of the elderly in experimental group before and after implementing selected nursing intervention.
2. To assess the pre and post test functional status of the elderly in control group.
3. To evaluate the effectiveness of selected nursing intervention in improving functional status among elderly in experimental group.
4. To find out the association between the post test functional status of experimental group with selected demographic variables (Age, Sex, Education status, Co-morbid diseases, Body mass index and Previous history of fall and fracture.)
5. To find out the association between the post test functional status of control group with selected demographic variables (Age, Sex, Education status, Co-morbid diseases, Body mass index and Previous history of fall and fracture.)

HYPOTHESES

All the hypotheses were tested at 0.05 level of significance.

H₁:

The mean post test functional status score of experimental group of elderly who had selected nursing intervention will be significantly higher than mean post test score of control group.

H₂:

The mean post test functional status score of experimental group of elderly who had selected nursing intervention will be significantly higher than mean pre test score in day 10 and 20.

H₃:

There will be a significant association between mean post test functional activity score of experimental group with selected demographic variables. (Age, Sex, Education status, Co morbid diseases, Body mass index and Previous history of fall and fracture.).

H₄:

There will be a significant association between mean post test functional activity score of control group with selected demographic variable (Age, Sex, Education status, Co morbid diseases, Body mass index and Previous history of fall and fracture.).

OPERATIONAL DEFINITIONS**Effectiveness**

Producing desired or indented result

It refers to the outcome of selected nursing intervention in improving functional ability among the selected elderly group. Functional Activity will be measured by the score obtained by the subject in Functional Activity Scale and Outcome expectation exercise measure.

Selected Nursing Intervention:

Action to take improve medical disorder.

Selected nursing intervention included in this study was teaching mobility training exercises It consists of Neck mobility exercise,Upper body and lower body mobility exercises which includes Manual resistance exercise, Isometric exercise for a period of 45 minutes to the elderly people.

Functional Status:

Affecting the operation rather than the structure of an organ.

Functional status refers to the capacity to engage in activities of daily living and social role activities by the elderly peoples increasingly as measured by Functional Activity Scale.

Elderly with Impaired Mobility

Having disability in specified kind.

Elderly refers to individuals above 60 years of age having functional impairment at the Dependent level and Partial dependent level in Functional Activity Scale residing at selected old age homes.

ASSUMPTIONS

1. Improving the functional status among elderly patient is an important function for all staff nurses.
2. Selected nursing intervention has no adverse effect on elderly patient.
3. Functional status will differ from one individual to other.

DELIMITATIONS

The following delimitation was set for the study:

- Patients with elderly who were come under the category of dependent and partial dependent of functional activity score residing in selected old age homes in Madurai.
- Therapeutic exercise were given for 45 minutes for 20 days
- The data collection period was six weeks.

PROJECTED OUTCOME

After performing the selected nursing intervention the subjects will be able to perform their ADL with minimal assistance and having improved Quality Of Life.

CONCEPTUAL FRAMEWORK

The conceptual framework for this study is based on Sister Callista Roy's Adaptation Model (1939) which involves four concepts.

Persons, Nursing, Health, Environment

The adoptive system has four component like input, process, effectiveness & output. For the present study the above mentioned components is modified.

Assessment refers to the assessment of ability to perform self care, mobility, communication pattern, of elderly with the help of Functional Activity Scale & Outcome expectation exercise measure scale.

Input refers to the selected nursing intervention for elderly with functional impairment in experimental group to improve their functional status.

Effectors refer to the regulator & cognator. These are the subsystems of the person as a system. In this the effectors are the adaptive modes of the elderly which are regulated by the neuro, muscular changes gained through the practice of selected nursing intervention.

Outputs of the person as a system are the behaviors of the person. Output behaviors are both external & internal. These behaviors may be observed, measured or subjectively reported, becomes the feedback of the system.

CHAPTER II

REVIEW OF LITERATURE

According to Polit and Hungler (1995), researchers almost never conduct a study in an intellectual vacuum. Their studies are usually undertaken with the context of an existing base of knowledge.

This chapter consists of,

1. Literature related to old age problems.
2. Literature related to exercise
3. Literature review related to functional status
4. Literature review related to improving mobility among elderly.

LITERATURE RELATED TO OLD AGE PROBLEMS

Medhi GK (2006) conducted a study to compare morbidity, activity of daily living instrumental activity of daily living (ADL-IADL disability) along with behavioral and biological correlates of diseases and disability of two elderly population groups (tea garden workers and urban dwellers) living in same geographical location. Two hundred and ninety three and 230 elderly from urban setting and tea garden respectively aged > 60 years were included in the study. Subjects were physical examined and activity of daily living instrumental activity of daily living (ADL-IADL) was assessed. Diagnosis of diseases was made on the basis of clinical evaluation, diagnosis and/or treatment of diseases done earlier elsewhere, available investigation reports, and electrocardiography. Hypertension was defined according to JNC-VI classification. BMI (weight/height²) was calculated. Logistic regression analysis was performed to see the impact of important background

characteristics on non-communicable diseases (NCD) and disability. Hypertension (urban - 68% and tea garden - 81.4%), musculoskeletal diseases (urban - 62.5% and teagarden - 67.5%), COPD and other respiratory problems (urban - 30.4% and tea garden - 32.2%), cataract (urban 40.3% and tea garden - 33%), gastro-intestinal problems (urban - 13% and tea garden - 6.5%) were more commonly observed health problems among community dwellings elderly across both the groups. Infectious morbidities, under nutrition and disability (ADL-IADL disability) were more pronounced among tea garden dwellers. Utilization of health service by tea garden elderly was very low in comparison to the urban elderly. Both tea garden men and women had very high rates of risk factors like use of non-smoked tobacco and consumption of alcohol.

A Biderman (2001) conducted a study on depression and falls are two common conditions that impair the health of older people. Dependent measures included: reporting two or more falls in the past year and a score of 7 or over on the S-GDS (Short Geriatric Depression Scale). A parsimonious set of risk factors was selected that predicted both outcomes based on a series of discriminant function analyses. The setting was a primary care clinic serving a mixed socio economic population, in Beer Sheva Isreal. The sample included 283 General Sick Fund members, aged 60 and over, who completed both baseline assessments and one year follow up interviews. At the one year follow up, 12% of the sample reported frequent falls in the past year and 25.5% of sample screened positive for depressive symptoms. A set of five risk factors that included: poor self rated health, poor cognitive status, impaired ADL, two or more clinic visits in the past month, and slow walking speed (10 seconds over five meters) was successful at discriminating between fallers and non fallers (86% discrimination) and between those with and without depressive

symptoms (76%). For every risk factors added, there was a significant increase in the proportion of respondents who had depressive symptoms. A similar result was found for falls. These results showed that there was a common set of risk factors that increases the risk of two common outcomes in geriatric medicine, falls and depression.

Shanthi and Krishnaswamy.(2005) conducted a prospective study which evaluated 100 patients above 60 years with falls. Comprehensive geriatric assessment including detailed history of fall, ADL using Barthel index, underlying medical disorders, and medication history was elicited. Examination included assessment of BMI, Mine Mental Status Examination (MMSE), cardiovascular, neurological and musculoskeletal system. Patients with injuries underwent relevant plain x-rays to diagnose fractures. Of the 100 patients, 68% were females. Among the causes for falls, intrinsic causes for falls were more prevalent in people >70 years. Among the medical conditions causing falls, musculoskeletal problems (72%) and visual defects (54%) were common. 46% had 3 or more risk factors for falls. The mean BMI was low in patients who sustained fractures. Fractures occurred in 48% of sedentary group as against 12% of exercising group. Drug induced falls accounted for 42% of which 20% were due to sedatives. Falls and fractures are more common in females. Falls due to intrinsic causes and recurrent falls were common in people >70 years. The sedentary group fell more frequently than exercising group due to lack of stability. Of the medical conditions predisposing to falls, musculoskeletal problems and visual defects were common. Multiple risk factors were common. Drug induced falls were commonly associated with sedatives.

Krishnamachari and Tinku (2008) conducted a study on health related conditions and socio-economic factors influence disability in the elderly. They examined the prevalence of health related disability in community dwelling elderly (>65 yr) residents in a suburb of Bangaluru, Karnataka, India, and assessed the association of disability with various socio-economic variables and current health status. Using the International Classification of Functioning of disability and Health (ICF). Disability was measured in 356 elderly in the Koramangala suburb of Bangaluru city. Various socio-economic and health related factors associated with disability were documented. A total of 85 per cent of the respondents reported current medical problems. Based on a total disability score computed from the participation section of the ICF, 27 per cent of the respondents had mild disability while 37 per cent had higher level of disability. Disablement was significantly associated with age > 75 yr and impairment in cognitive and sensory functions especially hearing. Findings revealed that: In this urban elderly population while majority had current medical conditions, a significant proportion did not experience any difficulties in activities of daily living. Restriction in participation in activities of daily living was more influenced by increasing age and impairment in cognitive functions and not current health status.

Ding Lee (2001) conducted a retrospective observational study and reviewed the case records of patients with impaired mobility at a geriatric assessment clinic. The study included 78 patients (42 males) with the median age of 78 years (61 to 96). About 80% had independent premorbid mobility. Delayed consultations (more than 2 years) were found in 17% of patients. One third had associated decline in transfer, dressing, toileting or bathing, while 19% also had decline in feeding. In each patient, cause(s), many which were potentially reversible, were identified to have contributed

to the immobility. More than one cause was identified in half of the patients. Intervention were prescribed in 88% of these patients. Short-term follow-up (median 7 weeks) showed that 21 had an improvement, 35 had the same and 8 had decline in mobility. There was a significant trend towards better outcome when patient presented early during their course of decline in mobility. ($p = 0.005$, linear by linear association = 0.013). Impaired mobility is a common pathway for many diseases, and is associated with significant functional decline.

LITERATURE RELATED TO EXERCISE

David Hogan (2001) and colleagues reported the results of their randomized controlled trial in which they used a multifactorial strategy or “consultation service” in an effort to reduce the risk of falling among 79 community-dwelling, Ambulatory people aged 65 years or more who had fallen at least once within 3 months of study entry. Eighty-four comparable elderly people (the control group) received a home visit and usual care. The intervention included a home visit by an assessor, which involved assessment of both the subject and the environmental risk factors for falling. Then an individualized fall-prevention plan was drawn up for each subject by the assessors, risk reducing recommendations were made in writing to the subject, the attending physician or the referral source (if different), and some of the subjects (57%) were referred to exercise classes. The adherence of participants in the intervention group was documented once, at 6 months, during the 12-month trial and was categorized as none, partial or complete. Overall adherence with the recommendations was 81% (partial and complete adherence combined), indicating that for most of the recommendations at least some attention had been paid to the problem in question, although the authors did not report any further analysis of this important issue so that the intensity, frequency and duration of each protective action

remained unknown. The intervention was found to have had little effect on the cumulative number of falls, the likelihood of participants having at least one fall during the 12-month follow up period or the mean number of falls per person, although it is of interest that all the between-groups differences favoured the intervention group.

Daniel and Rooks (2001) conducted experimental study to assess the effect of functional status among 108 patients scheduled to undergo hip or knee replacement. The patients were divided into two groups: 54 patients participated in water and land based exercises three times a week for the six week period immediately before surgery and 54 controls received educational materials. Prior to surgery all patients were questioned about their level of function and were evaluated in terms of lower extremity strength, balance and mobility. The exercisers participated in strengthen training, aerobics and flexibility exercises that were individually tailored to each person's fitness level, performed in a group and supervised by a physical therapist. The results showed that patients exercised reduced their odds of discharge to an inpatient rehabilitation facility by 73 percent. The exercisers were also more likely to walk more than 50 feet at the time of hospital discharge. Those who exercised responded differently before surgery and immediately following surgery depending upon the joint replaced.

Gloth and Master (2001) said that physical therapy and exercise are fundamental to the interdisciplinary approach to pain management in the elderly physical modalities used in combination with exercise provide pain relief and help to prevent future pathology and physiologic changes in the elderly that often result significant pain syndromes.

Brunner and Suddarth (2005) said that “Exercise is the foundation of preparation”. Therapeutic exercise are prescribed and performed with the assistance and guidance of physical therapist or nurse. The patient should have a clear understanding of what the prescribed exercise is to be accomplished. Providing written instructions setting forth the frequency duration and number of repetitions, as well as simple line drawing exercises helps to adherence to the exercise program.

Bonnie Bruce (2005) and colleagues from Stanford University, USA, compared the level of pain in a group of runners and a group of community-based individuals who acted as controls. Participants were followed for 14 years, and were on average in their mid-sixties when the study started. Each year, they completed a questionnaire about their health status, exercise habits and history of injuries. In total, the study included 866 subjects: 492 Runners' Association members and 374 controls. Results showed that the greater majority of physically active participants did, on average, between 355 and 2,119 minutes of exercise per week over the course of the study, while controls exercised significantly less. After adjusting for confounding factors such as gender, age, weight and health status the results show that pain increased in both groups over time. But members of the Runners' Association experienced 25% less musculoskeletal pain than controls. This reduction persisted throughout the study period, until the subjects reached an age of 62 to 76 years. "Exercise was associated with a substantial and significant reduction in pain even despite the fact that fractures, a significant predictor of pain, were slightly more common among runners", conclude the authors. More research is needed to investigate the mechanisms that might underlie the effect of exercise on musculoskeletal pain in old age.

McDermott (2006) explain, "There are four ways to improve physical fitness: aerobic exercise, resistance training, flexibility, and lifestyle modification." All programs should include combinations of these types of activities, and be tailored toward the individual's fitness goals. "For example," McDermott says, "when the goal is to improve functional capacity in activities of daily living, a cross-training program emphasizing the core muscle groups of the back, thighs, and abdomen is preferred." "Only 30 percent of America's senior citizens engage in regular exercise," notes McDermott, "yet there is compelling evidence suggesting that people in all conditions of health and at all fitness levels benefit from regular physical activity. In fact, the most de-conditioned individuals have the greatest and fastest response." Mernitz adds, "Seniors tend to have less access than other demographic groups to physical activity information and programming. In contrast, they have relatively more contact with their health care providers." "Starting an exercise program later in life can significantly modify risk factors, even if a person has been sedentary in prior years," McDermott concludes. "Health care providers can play a major role in offering effective and inexpensive primary or adjunct therapies, encourage appropriate physical activity, and dispel myths that persist as barriers to exercise in the elderly."

LITERATURE REVIEW RELATED TO FUNCTIONAL STATUS

Kelly (2009) conducted a meta-analysis to examine the impact of exercise and health related quality of life in older community based adults. The study included 11 randomized clinical trials (RCT) that included 617 men and women. Physical activity intervention aims for the clinical trials included strength training, aerobic training with some that participated in both types of activities. The SF-36 PCS was the principal outcome in these RCTs. Results indicated that physical activity demonstrated statistically significant increases in physical functioning in the small to

moderate range of effects. Odds ratio of 2.14 (95% CI; 1.42-3.24) was interpreted as an odds of improving in physical functioning more than 2 times greater with a physical activity intervention compared with the odds in a control group without physical activity. These differences were deemed clinically relevant, the paper also points out that the integration of combined strategies such as strength and aerobic exercise can have a larger effect.

Stuck (2002) conducted a meta-analysis to evaluate the effects of home visitation programs on functional status, nursing home admission, and mortality in elderly adults. The analysis examined 1349 abstracts in five languages that reported randomized trials on the effects of preventive in-home treatments in older community-dwelling populations. After exclusions were made, two reviewers independently screened the remaining 17 articles for information on functional status, nursing home admission, and mortality among study populations. The combination of trials using multi-dimensional ADL assessments and follow-up gave a 24% reduction in the risk of functional decline. (RR, 0.78; 95% CI, 0.64-0.94). The group concluded that such home visitation programs “appear to be effective, provided the intervention are based on multidimensional geriatric assessment and include multiple follow-up home visits and target persons at lower risk for death”.

Mor, Wilcox, Rakowski and Hiris (1994) described 6-year rates and correlates of functional change in the elderly, as well as associated hospital use. The longitudinal study on Aging (n= 7527) and matched Medicare claims were used to calculate 6-year functional status transition rates and hospital use rates. A hierarchical measure that incorporated activities of daily living, instrumental activities of daily living, and competing risks of institutionalization and death was used to assess

functional status. Multinomial logistic regression was used to predict 1990 status. The functional status of 12% of men and women 70 to 79 years of age who were initially impaired in instrumental activities of daily living improved, and about half of the initially independent people in that age group remained so, Multivariate analyses revealed that age, baseline functioning, self-rated health, and co morbidity predicted 1990 status. Both baseline functioning and functional change were related to hospitalization. This study support others that have shown some long-term functional improvement, but commonly decline, in the elderly. Furthermore, it documents the link between functional decline and increased hospital use.

LITERATURE REVIEW RELATED TO NURSES ROLE IN IMPROVING MOBILITY AMONG ELDERLY

Micelli (2008) Explained a general safety precaution and fall prevention measures that apply to all patients, especially older adults:

1. Assess the patient care environment routinely for extrinsic risk factors and institute appropriate corrective action.
 - Use standardized environmental checklists to screen; document findings.
 - Communicate findings to risk managers, housekeeping, maintenance department, all staff and hospital administration, if needed.
 - Re-evaluate environment for safety.
2. On admission, assess/screen older adult patient for multifactorial risk factors to fall, following a change in condition, on transfer to a new unit, and following a fall.

- Use standardized or empirically tested fall-risk tools in conjunction with other assessment tools to evaluate risk for falling (e.g. Tinetti Performance Oriented Mobility, The Timed Get Up and Go Test)
- Document findings in nursing notes, interdisciplinary progress notes, and the problem list.
- Communicate and discuss findings with interdisciplinary team members.
- In the interdisciplinary discussion, include review and reduction or elimination of high-risk medications associated with falling.
- As part of falls protocol in the facility, flag the chart or use graphic or color display of the patient's risk potential to fall.
- Communicate to the patient and the family caregiver identified risk to fall and specific intervention chosen to minimize the patient's risk.

CHAPTER – III

RESEARCH METHODOLOGY

The research methodology indicates the general pattern of organizing the procedure of gathering valid and reliable data for an investigation. This chapter provides brief description of the method adopted by the investigator in this study.

It includes the research approach, research design, the setting, the population, the sample and criteria for the sample selection. It further deals with the development of tool, pilot study and procedure for data collection and plan for data analysis.

RESEARCH APPROACH

An experimental approach method was used to determine the effectiveness of selected nursing intervention in terms of improving the functional status among the elderly patient in selected old age homes in Madurai.

RESEARCH DESIGN

Quasi experimental Pre Test Post Test control group research design was adopted. This design is represented as follows

Group	Pre test	Intervention	Post test	
			Day 10	Day 20
Experimental group	O ₁	X	O ₁₀	O ₂₀
Control group	O ₁		O ₁₀	O ₂₀

Key:

O₁ – Pre test assessment of functional activity

X – Intervention (therapeutic exercises)

O₂ – Post test assessment of functional activity (10th and 20th day).

VARIABLES

Dependent variable: Functional status.

Independent variable: Selected nursing intervention.

SETTING OF THE STUDY

The pilot study was conducted in Christian Seva Sangam, Alakappanagar which is 14km from Sacred Heart Nursing College. It is having elderly population (above 60 years) of 28 with 7 males, 21 females. The main study was conducted in Zion trust, Kudal Nagar for experimental group which is 4km from Sacred heart Nursing College. It is having elderly population (above 60 years) of 68 with 18 males 50 females. And also study was conducted in Poongkodi old age home, Poovanthi for control group which is 27km from Sacred Heart Nursing College. It is having elderly population (above 60 years) of 63 with 26 males, 37 females.

These old age homes were chosen because of the researchers familiarity with the setting.

STUDY POPULATION

The target population of the study were elderly patient from selected old age homes in Madurai.

SAMPLES

Elderly patients who fulfill the inclusion criteria from the selected old age homes.

SAMPLE SIZE

The total sample size was 60, out of which 30 samples were in the experimental group and 30 samples were in the control group.

SAMPLE TECHNIQUE

Purposive sampling technique used to select subjects.

CRITERIA FOR SAMPLE SELECTION

The sample was selected based on the following inclusion and exclusion criteria.

INCLUSION CRITERIA

- Elderly patient with decreased mobility who were residing in selected old age homes at Madurai.
- Elderly patients who can speak and understand Tamil or English.
- Elderly patients who can actively participate in the exercise and activities.

EXCLUSION CRITERIA

- Elderly patients who are critically ill
- Elderly patients who are affected with paralysis.
- Patient who are not fit for doing exercise as per medical advice. (Respiratory, cardiovascular and muscular skeletal disorders etc.)

RESEARCH TOOL AND TECHNIQUE

Part I

It consists of a semi structured interview schedule. It had questions related to the demographic variables, Information about the sample health status.

a. Demographic data

It included information such as Age, Sex, Education status.

b. Health status

It included Co morbid diseases, Body mass index, Previous history of fall and fracture.

Part II

The second tool was modified functional status index scale for assessing the functional activities. It is divided in five headings (ie) 1. Walking, 2. Climbing upstairs, 3. Raising from a chair, 4. Reaching into low cupboard, 5. Doing laundry.

Each activities are assessed and scored by using the parameters of assistance, pain and difficulty are experienced by the patient in performing these activities. The score for the scale is for Assistance – one to five, for Pain zero to four, for Difficulty – one to four.

Based on the functional activity scores obtained by the patient. They were orbitarily grouped into 3 groups as follows.

	Score
Independent	44- 65
Partially dependent	22 – 43
Dependent	1 – 21

Part III

The third tool was modified outcome expectations for exercise measure. After the continued practice of 20 days exercise program assessed the feedback of samples about physical and mental happiness . The score for the scale had option of Strongly Agree & Disagree.

RELIABILITY OF THE TOOL:

The reliability of tool determined by inter rater method. According to Karl Pearson's correlation coefficient the reliability of the tool was 0.94, which was highly reliable.

VALIDITY OF THE TOOL:

Validity of the tool and procedure established by giving the content and tool to 5 experts in the field of nursing and physiotherapist. Modifications were done according to their recommendations.

DEVELOPMENT OF CONTENT FOR THERAPEUTIC EXERCISE

Based on the review of literature and experts opinion the content was developed for administering therapeutic exercises. The content included under therapeutic exercises were Neck mobility exercise, Manual resistance exercise, Isometric exercise. The content for therapeutic exercises was submitted to five experts for content validity based on their suggestions, the content was modified. Therapeutic exercise content is Annexed in Annexure VI.

PILOT STUDY

In order to test the feasibility, relevance and practicability of the study, Pilot study conducted among 6 patients 3 in experimental and 3 in control group in selected old age homes in Madurai. Data were analyzed to find out the suitability of statistical method. It revealed that the study was feasible.

DATA COLLECTION PROCEDURE

Before conducting the study, the researcher obtained formal permission to conduct the study from selected old age homes and the dissertation committee of the sacred Heart Nursing College, Madurai. The researcher introduced to the selected sample and verbal consent obtained from each subject after giving assurance of confidentiality. The period of study extended for 6 weeks, the data was collected Monday to Saturday, alternative days. The researcher demonstrated mobility training exercises to experimental group. Intervention to study subject was given between 9 am to 1pm and 3pm to 6pm. Each day data was collected from available sample. The elderly people were participated with interest and they were eager to learn about the exercises. The therapeutic exercise was given to the samples in the bed side where privacy was maintained. Initially the subjects were introduced in order to collect demographic data. It took about 10 minutes for each subject. Afterwards assessed their functional activities by using the functional status index. After the interview and assessment, 45 minutes of intervention (Therapeutic exercises) was given for the experimental group for 21 days. Then the persons are instructed to do the exercise 5 times daily for 10 minutes at a time regularly during their rest time.

The subjects are told to maintain a diary to verify whether they are continuing exercises as per instruction. And also instruction was given to consent authority of the old age home. On the 10th day functional activity were assessed by using functional status index. Then they were told to continue the procedure regularly. Post assessment of functional activities of daily living were assessed on the 20th day of intervention.

Sample for control group were selected from Poongodi old age home, Poovanthi. Level of functional status was assessed using Functional activity index scale and the patient's who had impaired mobility were selected. The samples were received only the routine care. First day pre test was done and post test was made on 10th and 20th day using functional activity index scale. Samples of the control group were explained about the effectiveness of therapeutic exercises after the post test.

PLAN FOR DATA ANALYSIS

After the data collection, the collected data were organized, tabulated, summarized and analyzed. The data were analyzed. According to objectives of the study by using descriptive and inferential statistics.

1. Analysis of frequencies and percentage used for demographic data.
2. Hypothesis related to the effectiveness of therapeutic exercises improving the functional activities was tested using paired't' test, mean and standard deviation.
3. Chi-square test of significance was used to find out the association between the level functional activities with selected demographic variables (age, sex, educational status, co-morbid diseases, body mass index, previous history of fall & fracture).

PROTECTION OF HUMAN RIGHTS

Research proposal was approved by the dissertation committee, prior to the pilot study and the main study permission was obtained from the Head of the Department of Sacred Heart Nursing College, Madurai. Formal permission obtained from the respective authority of the selected old age home. Assurance was given to the subjects, that confidentiality would be maintained. Oral consent was obtained from the study subjects .The subjects were explained at any time they have got the rights to withdraw from the study.

SUMMARY

This chapter has dealt briefly with research methodology adopted for the study. It included the research approach, research design, setting, population, sampling technique, research tool, testing of tool, pilot study, data gathering process and plan for data analysis.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the description of the sample, classification, analysis and interpretation of the data collected to evaluate the achievement of the objectives of the study. The data collected is tabulated and presented as follows:

Presentation of the Findings of the study

- | | |
|------------|--|
| Section I | Demographic profile of the sample |
| Section II | <ol style="list-style-type: none">1. Distribution of participations according to the level of functional activity score before and after administration of therapeutic exercises. |
| Section II | <p>Comparison of Functional activity score of the patient</p> <ol style="list-style-type: none">1. Comparison of mean Functional activity score of the experimental group before and after therapeutic exercise on day ten.2. Comparison of mean Functional activity score of the control group before and after therapeutic exercise on day ten.3. Comparison of mean Functional activity score of the experimental group before and after therapeutic exercise on day twenty.4. Comparison of mean Functional activity score of the control group before and after therapeutic exercise on day twenty |

5. Comparison of mean Functional activity score of the experimental group before and after therapeutic exercise on day ten and twenty.
6. Comparison of mean Functional activity score of the control group before and after therapeutic exercise on day ten and twenty

Section IV

1. Association between functional activity score of experimental group subjects with demographic variables (age, sex, educational status, co-morbid diseases, BMI, previous history of fracture.)
2. Association between functional activity score of control group subjects with demographic variables (age, sex, educational status, co-morbid diseases, BMI, previous history of fracture.)

Section V

1. Feedback of the elderly people in experimental group through the outcome expectation exercises measure.

SECTION – I

Demographic Profile of the Samples

Table 1

Distribution of sample according to Demographic Variables

Characteristics	N=60					
	Experimental Group (n=30)		Control Group (n=30)		Total (n=60)	
	F	%	F	%	F	%
1. Age (in years)						
60-65	2	6.67	4	13.33	6	10
66-70	7	23.33	14	46.67	21	35
71-75	13	43.33	9	30	22	36.66
76-80	8	26.67	3	10	11	18.33
2. Sex						
Male	15	50	15	50	30	50
Female	15	50	15	50	30	50
3. Educational Status						
Illiterate	7	2.33	12	40	19	36.66
literate						
i. Primary School level	5	16.67	3	10	8	13.33
ii. Middle School level	8	26.67	4	13.33	12	20
iii. High school level	6	20	4	13.33	10	16.66
iv. Higher secondary level	3	10	4	13.33	7	11.66

Under graduate	1	3.33	3	10	4	6.66
Post graduate	0	0	0	0	0	0
4. Co morbid disease						
Yes	21	70	23	76.67	44	73.33
No	9	30	7	23.33	16	26.66
5. BMI						
Normal weight	25	80	24	80	49	81.66
Over weight	4	13.33	6	20	10	16.66
Obese	1	3.33	0	0	1	1.66
6. Previous History of fall and fracture						
Yes	5	16.66	8	26.67	13	21.66
No	25	83.33	22	73.33	47	78.33

The data in the table 1 predicts that most of the sample 13 (43.33%) in experimental group were between 71-75years, where as 14 (46.67%) in the control group were between 66-75 years.

With regard to sex there was equal distribution of male and female sample 15 (50%) in both experimental group and control group.

Regarding educational status majority of the patient 8 (26.67%) were completed middle school in experimental group, where as in the control group 12 (40%) were illiterate.

Regarding co morbid diseases majority of the sample 21 (70%) had disease in the experimental group, where as in control group 23 (76.67%) had co morbid diseases

Regarding BMI majority of the patient 25 (80%) were having normal weight in experimental group, 24 (80%) in control group comes under normal weight category.

Regarding previous history of fall and fracture in both group most of the patient 25 (83.33%), in experimental and in control group 22 (73.33%) had no previous history of fall and fracture.

SECTION II

Table 2

Distribution of subjects according to the level of functional activity score before and after administration therapeutic exercises.

N=60

Level of Functional Activity	Experimental Group				Control Group			
	n=30							
	Pretest		Posttest		Pretest		Posttest	
	F	%	F	%	F	%	F	%
Dependent	0	0	0	0	0	0	0	0
Partially Dependent	30	100	7	23.33	30	100	30	100
Independent	0	0	23	76.66	0	0	0	0

Based on the functional status index, the subjects were classified into three groups as dependent (1-21), partially dependent (22-43), Independent (44-65).

The data on table 2 shows that before administration of therapeutic exercises in experimental group 30 sample (100%) were partially dependent. But after administration of therapeutic exercises 23 sample (76.66%) were become independent and 7 (23.33%) sample belong to partially dependent group.

Where as in control group in pre and post test 30 (100%) samples were in partially dependent (100%) category.

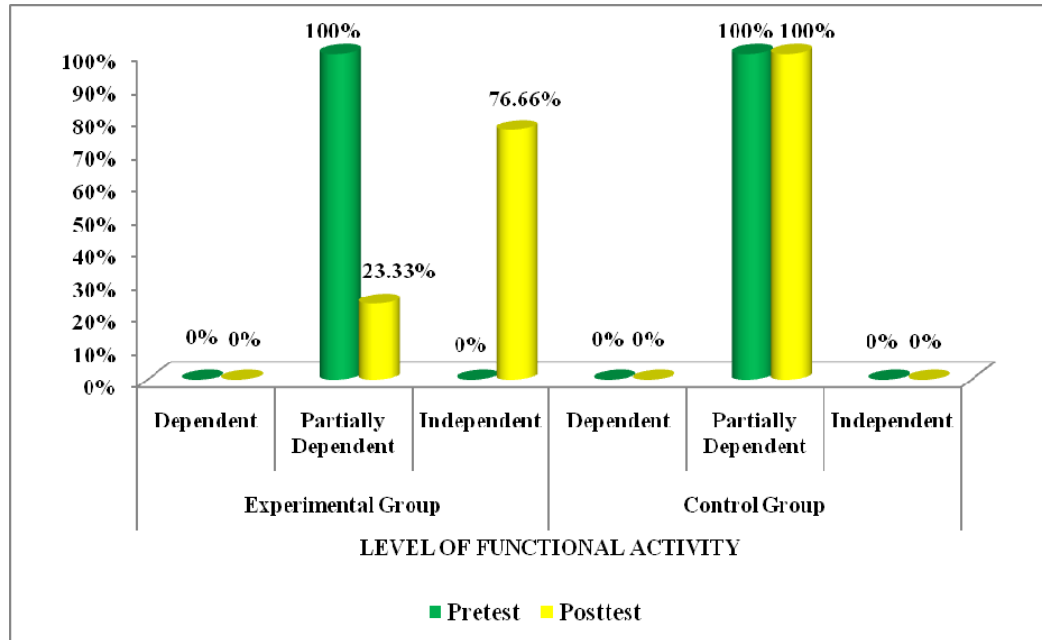


Figure 2: Distribution of subjects according to the level of functional activity score before and after administration therapeutic exercises.

SECTION III

Comparison of Functional Activity Score of the Subjects

Table 3

Comparison of Mean Functional activity score of experimental group before and after administration of therapeutic exercises on day 10.

N=30				
Test	N	Mean	SD	't' Value
Pretest	30	33.56	5.97	4.85
Posttest on day 10	30	40.16	5.40	

*Significant at 0.05 level

In the present study functional activity was measured by functional activity index scale. A higher score indicate good functional activity, where as low score indicate poor functional activity.

Table 3 shows that the mean functional activity score 40.16 after administration of therapeutic exercises on day 10 is higher than the mean functional activity score 33.56 before administration of therapeutic exercises. The obtained 't' value is 4.85 which is significant at 0.05 level. Since obtained 't' value is higher than the table value. So it may be inferred that continuous therapeutic exercises is an effective method in improving the functional activity of the elderly people.

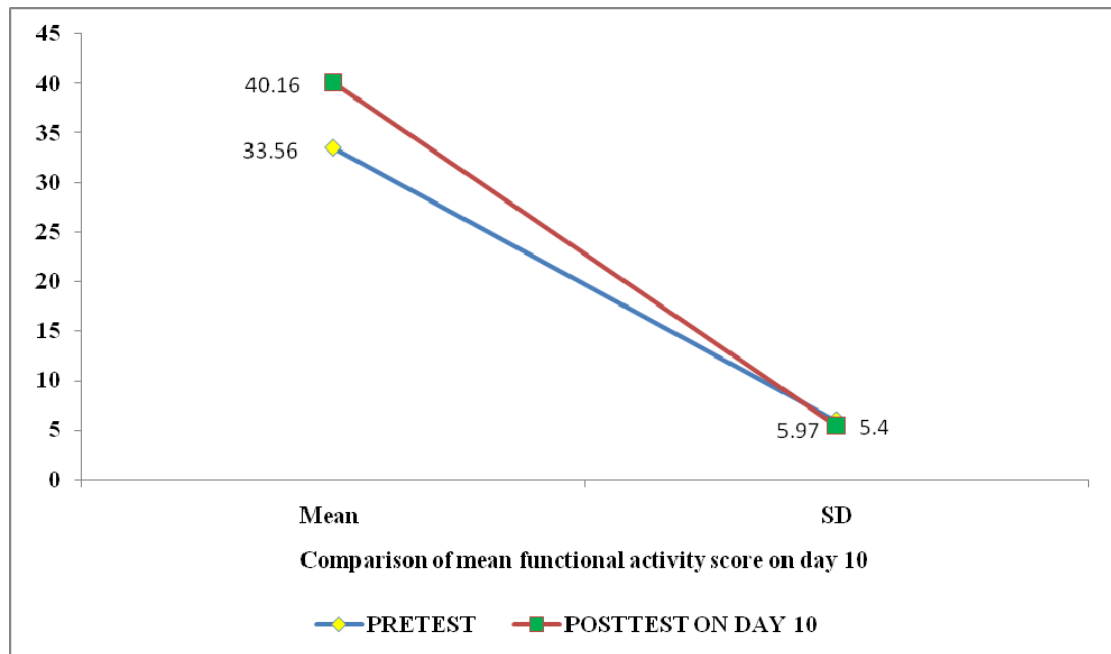


Figure: 3 Comparison of Mean Functional activity score of experimental group before and after administration of therapeutic exercises on day 10.

Table 4

**Comparison of Mean Functional activity score of control group
before and after administration of therapeutic exercises on day 10.**

N=30

S.No.	Test	N	Mean	SD	't' Value
1.	Pretest	30	33.66	5.59	0.03
2.	Posttest on day 10	30	36.70	5.05	

In order to find out the significant difference between the mean functional activity score of the control group on day 10, 't' value was computed to test the statistical significant.

Table 4 shows that the mean functional activity score for control group are 36.70 on day 10 is slightly higher than the mean functional activity score 33.66 pretest score. The obtained 't' value is 0.03 which is not significant at 0.05 level.

Table 5

Comparison of Mean Functional activity score of the experimental group before and after administration of therapeutic exercises on 20th day.

N=30				
Test	N	Mean	SD	't' bValue
Pretest	30	33.56	5.97	*10.19
Posttest	30	46.30	5.21	

* Significant at 0.05 level

In order to find out the significant difference between the mean functional activity score before and after administration of therapeutic exercises on day 20, in experimental group. Following null hypothesis was stated.

Ho1 → The mean post test functional status score of experimental group who had selected nursing intervention will not be significantly higher than mean pre test score.

The data presented in table 5 shows that the mean functional activity score 46.30 after administration of therapeutic exercise on day 20 is higher than mean functional activity score 33.56 before administration of therapeutic exercises. The obtained 't' value is 10.19 which is significant at 0.05 level df (58). obtained 't' value is higher than the table value. Hence the null hypothesis Ho1 is rejected and the research hypothesis H1 is accepted. Therefore it can be inferred that the therapeutic exercise had been effective in improving the functional activity of the elderly people.

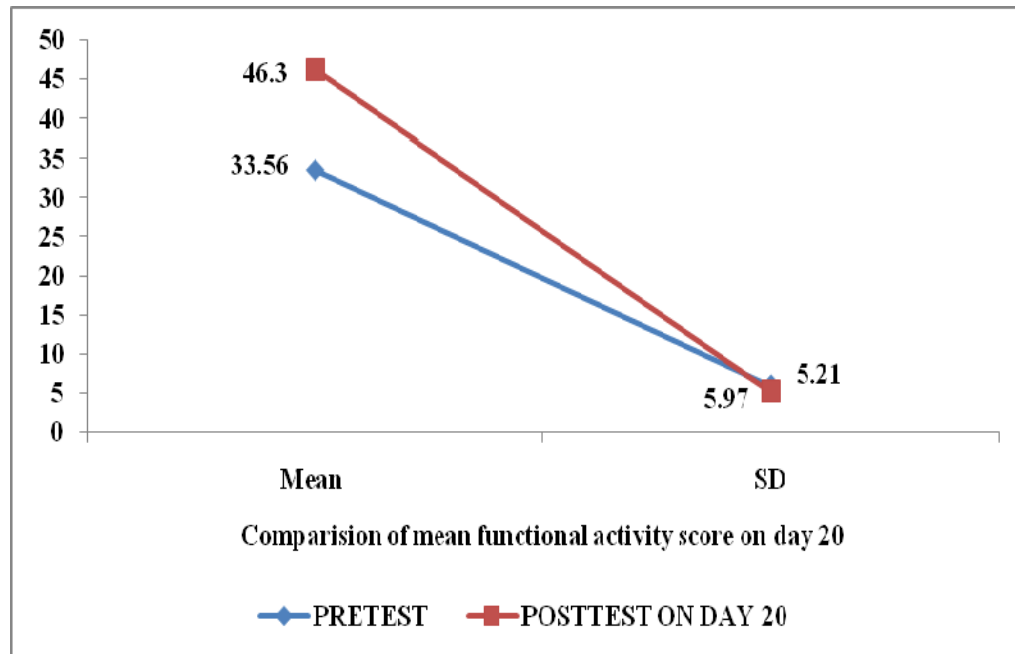


Figure: 4 Comparison of Mean Functional activity score of the experimental group before and after administration of therapeutic exercises on 20th day.

Table 6

Comparison of Mean Functional activity score of the control group on 20th day.

N=30

S.No.	Test	N	Mean	SD	't'bValue
1.	Pretest	30	36.66	5.59	0.33
2.	Posttest	30	37.10	5.13	

* Significant at 0.05 level

Table 6 shows that the mean functional activity score for control group are 37.10 on day 20 is slightly higher than the mean functional activity score 36.66 pretest score. The obtained 't' value is 0.33 which is not significant at 0.05 level.

Table 7

Comparison of Mean Functional activity score of the subjects in experimental group after administration of therapeutic exercises on 10th and 20th day.

N=30

S.No.	Test	N	Mean	SD	't'bValue
1.	Posttest on day 10	30	40.16	5.40	5.24
2.	Posttest on day 20	30	46.30	4.32	

* Significant at 0.05 level

Table 7 shows that the mean functional activity score 46.30 after administration of therapeutic exercises on day 20 is higher than the mean functional activity score 40.16 on day 10. The obtained 't' value is 5.24 is higher than the table value. Therefore it can be concluded that the continuous administration of therapeutic exercise had been effective in improving the functional activity of the elderly people.

Table 8

Comparison of Mean Functional activity score of the subjects in control group on 10th and 20th day.

N=30

S.No.	Test	N	Mean	SD	't'bValue
1.	Posttest on day 10	30	36.70	5.13	0.33
2.	Posttest on day 20	30	37.10	5.05	

* Significant at 0.05 level

Table 8 shows that the mean functional activity score for control group are 37.10 on day 20 is slightly higher than the mean functional activity score 36.70 on day 10. The obtained 't' value is 0.33 which is not significant at 0.05 level.

Table 9

Comparison of mean post test functional activity score of experimental group after the administration of therapeutic exercises with control group post test score.

N=30

Group	Test	N	Mean	SD	't'Value
Experimental Group	Posttest on day 20	30	46.30	4.31	8.57
Control Group	Posttest on day 20	30	36.70	5.05	

* Significant at 0.05 level

In order to compare the mean post test functional activity score of experimental group after the administration therapeutic exercises with control group.

The null hypothesis was stated as follows:

Ho2 → the mean post test functional activity score of experimental group will not be significantly higher than mean post test score of control group.

Table 9 shows that the mean post test functional activity score 46.30 after administration of therapeutic exercises on day 20 is lower than the mean post test functional activity score of control group 36.70. The obtained 't' value is 8.57 which is significant at 0.05 level. Since the obtained 't' value is higher than the table value. The researcher accept the research hypothesis and reject the null hypothesis. So it may be inferred that continuous therapeutic exercises is an effective method in improving the functional activity of the elderly people.

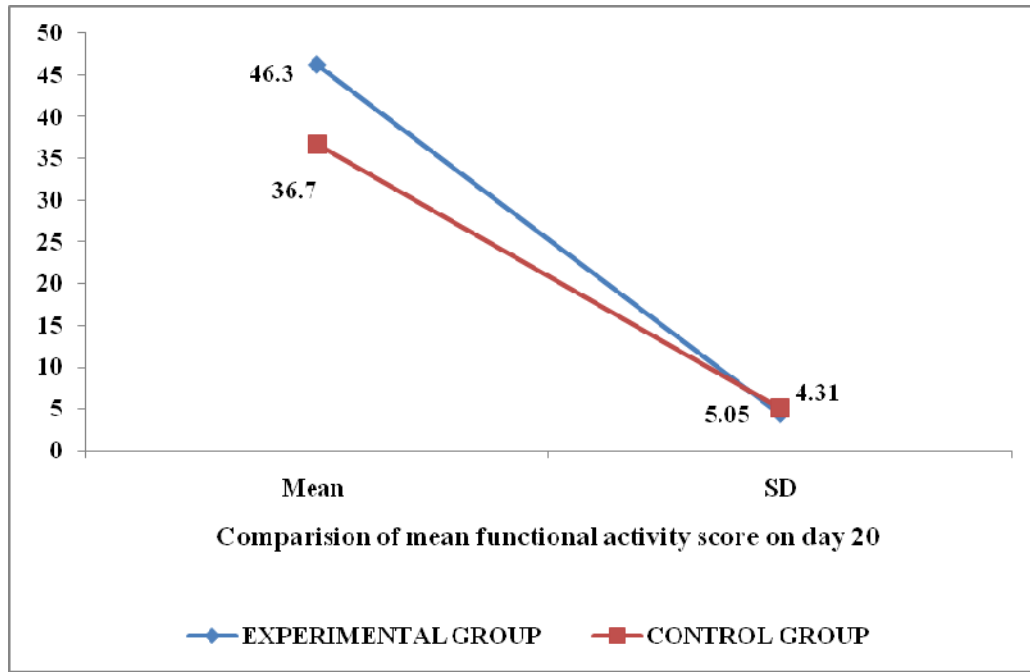


Figure 5: Comparison of mean post test functional activity score of experimental group after the administration of therapeutic exercises with control group post test score.

SECTION IV

Table 10

Effectiveness of selected nursing intervention in improving functional activity among elderly in experimental group on 10th & 20th day.

N=30

Group	N	Experimental Group	
		SD	't' value
Pretest & Posttest on day 10	30	2.32	15.61
Pretest & Posttest on day 20	30	3.33	19.58
Posttest 10 th & Posttest day 20	30	2.66	12.77

Table 10 shows Effectiveness of selected therapeutic exercises in improving functional status among elderly in experimental group. In this study obtained 't' value shows effectiveness between the pretest on post test on 10th day 15.61 and obtained 't' value for pretest on post test 20th day 19.58. Effectiveness of selected therapeutic exercises in improving functional status among elderly in experimental group on post test 10th and 20th score 12.77.

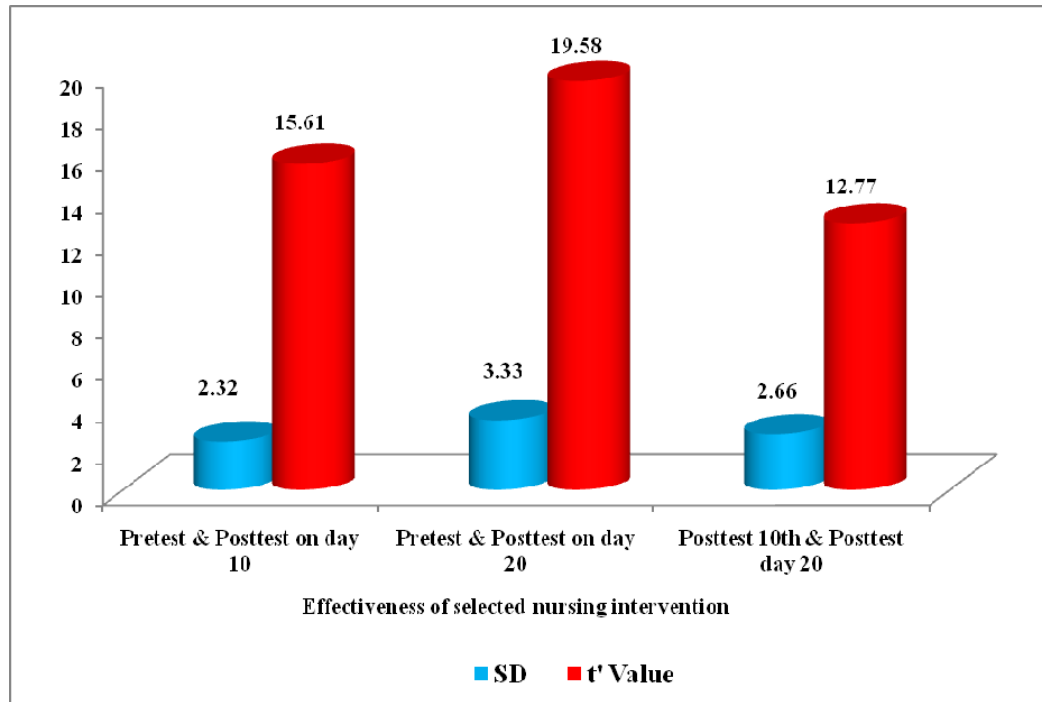


Figure 6: Effectiveness of selected nursing intervention in improving functional activity among elderly in experimental group on 10th & 20th day.

Table 11

Effectiveness of selected nursing intervention in improving functional activity among elderly in control group on 10th & 20th day.

Group	N	Control Group	
		SD	't' value
Pretest & Posttest on day 10	30	1.56	0.46
Pretest & Posttest on day 20	30	1.54	0.10
Posttest 10 th & Posttest day 20	30	1.74	1.70

Table 11 shows Effectiveness of selected therapeutic exercises in improving functional status among elderly in control group. In this study obtained 't' value shows effectiveness between the pretest on post test 10th day 0.46 and obtained 't' value for pretest on post test 20th day 0.10. Effectiveness of selected therapeutic exercises in improving functional status among elderly in experimental group on post test 10th and 20th score 1.70.

SECTION VI

Table 12

Association of functional Activity score of the subjects with demographic variables in experimental group.

Demographic Variables	Functional Activity		N	χ^2 Value
	Score			
	Below Mean	Above Mean		
1. Age in years				
a)60-65	1	1	2	#2.87
b)66-70	3	4	7	
c)71-75	8	5	13	
d)76-80	2	6	8	
2. Sex				
a) Male	9	6	15	#1.2
b) Female	6	9	15	
3. Educational Status				
a) Illiterate	4	3	7	#12.59
b) literate				
i. Primary School level	3	3	5	
ii. Middle School level	4	4	8	
iii. High school level	3	3	6	
iv. Higher secondary level	3	0	3	

b) Under graduate	1	0	1
c) Post graduate	0	0	0

4. Co morbid disease

a) Yes	8	13	21	#3.94
b) No	7	2	9	

5. BMI

Normal weight	12	13	25	#1.12
Over weight	2	2	4	
Obese	1	0	1	

6. Previous History of fall and fracture

Yes	2	3	5	#0.24
No	13	12	25	

Not significant at 0.05 level

* Significant at 0.05 level

To find out If there is any association between level of functional activity among the experimental group and selected demographic variables (age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture.) null hypothesis was stated as follows:

Ho3 → There will be no association between the post test score of functional activity of the group and selected demographic variables (age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture.)

In order to find out the association between the level of functional activity of the subject and selected variables chi-square test was computed. There was no association between level of functional activity of the group and age. The obtained χ^2 value of 2.87 at df (1) was not significant at 0.05 level.

It was found that there is no relationship between level functional activity of the elderly group and age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture. The obtained X^2 value for sex was 1.2 at df (1), for education status was 12.59 at df (1), for co morbid diseases was 3.94 at df (1), for body mass index was 1.12 at df (1), or previous history ofcc all and fracture was 0.24 at df (1) was significant at0.05 level.

There was no association between functional activity score and age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture for experimental group. So the researchers accept the null hypothesis and reject the researcher hypothesis. So it can be inferred that therapeutic exercise has an effect in functional activity with out influencing demographic variables of the samples.

Table 13

Association of functional Activity score of control group with demographic variables.

Demographic Variables	Functional Activity		N	χ^2 Value
	Score			
	Below	Above		
	Mean	Mean		
1. Age in years				
a)60-65	3	1	4	#2.02
b)66-70	10	4	14	
c)71-75	4	5	9	
d)76-80	2	1	3	
2. Sex				
a) Male	10	5	15	#0.14
b) Female	9	6	15	
3. Educational Status				
a) Illiterate	9	3	12	#4.84
b) literate				
i. Primary School level	1	2	3	
ii. Middle School level	2	2	4	
iii. High school level	4	0	4	
iv. Higher secondary level	2	2	4	

b) Under graduate	2	1	3
c) Post graduate	0	0	0

4. Co morbid disease

a) Yes	16	7	23	#1.64
b) No	3	4	7	

5. BMI

Normal weight	16	8	24	#0
Over weight	4	2	6	
Obese	0	0	0	

6. Previous History of fall and fracture

Yes	5	3	8	#0
No	14	8	22	

Not significant at 0.05 level

* Significant at 0.05 level

To find out if there is any association between level of functional activity among the control group and selected demographic variables (age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture.) the null hypothesis was stated as follows:

Ho4 → There will be no association between the post test functional activity score of the control group and selected demographic variables (age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture.)

In order to find out the association between the level of functional activity of the subject and selected variables chi-square test was computed. For the convenient of computation and tabulation the researcher had clubbed the age group as 60-65 years, 66-70 years, 71-75 years, and 76-80 years. There was no association between level of functional activity of the group and age. The obtained χ^2 value of 2.02 at df (1) was not significant at 0.05 level.

It was found that there is no association between level functional activity of the elderly group and age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture. The obtained X^2 value for sex was 0.14 at df (1), for education status was 4.84 at df (1), for co morbid diseases was 1.64 at df (1), for body mass index was 0.003 at df (1), or previous history of all and fracture was 0.003 at df (1) was significant at 0.05 level.

There was no association between functional activity score and age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture for control group. So the researcher accept the null hypothesis and reject the researcher hypothesis.

This chapter dealt with tabulation and analysis o the data using descriptive o and inferential statistics.

SECTION V

Table 14

The feedback of the elderly people in experimental group through the outcome expectation exercises measure.

Characteristics	Agree		Disagree	
	F	%	F	%
Continues practice of 20 days exercise program				
Physical happiness				
Improved your endurance in performing daily activity	30	100	0	0
Made you feel better physically	27	90	3	10
Made your muscle stronger	28	93.33	2	6.73
Mental happiness				
Changed your mood better in general	30	100	0	0
Helped you to feel less tired	30	100	0	0
Makes you to enjoy doing exercise	30	100	0	0
Gives you a sense of personal accomplishment	30	100	0	0
Made you become more mentally alert	30	100	0	0

Table 14 Predicts that 25 out of 30 had positive feelings towards the exercise measure. Where as 5 out of 30 had some short of negative feeling towards the benefit of exercises. Specifically which make them to have physically feel better and muscle stronger.

CHAPTER V

DISCUSSION

This study was conducted to evaluate the effect of therapeutic exercises on functional activities among elderly patients from selected old age homes at Madurai. The study findings are discussed in this chapter with reference to the objectives, the framework and hypotheses stated in chapter 1.

1. Demographic Characteristics of the Samples

- With regard to age 43.33% sample were between the age of 71-75 years.
- With regard to sex there was an equal (50%) distribution of male and female.
- With regard to education majority of the subjects 26.67% were studied up to middle school level
- Regarding Co morbid diseases of the subjects 70% were having diseases.
- About body mass index of the subjects 80% had normal weight.
- It was found that 83.33% of subjects were not having previous history of fall and fracture.

2. Distribution of Samples According to their Level of Functional Activity before and after administration of therapeutic exercise

Table-2 shows that 30 samples (100%) in the experimental group were partially dependent before the administration of therapeutic exercises. But after administration of therapeutic exercises 23 sample (76.66%) were become independent and 7 (23.33%) sample belong to partially dependent group. Where as in control group in pre and post test 30 (100%) samples were in partially dependent (100%) category.

Present study findings is co-inside with the findings of Maria, Hamid and Mohan (2011), study They conducted a quasiexperimental study aimed to measure the effects of 12-week multicomponent exercise training on physical functioning among institutionalized elderly. Forty-three participants (age = 70.88 ± 7.82 years) were self-assigned to an intervention ($n = 23$) and control ($n = 20$) group. Before and after training, cardiorespiratory endurance, armcurlstrength, grip strength, lower limb strength, upper and lower limb flexibility, balance, and mobility were assessed. The training included aerobic, resistance, balance and flexibility exercises, performed 3 times per week. Significant increases ($P < 0.05$) were observed in the exercise group on cardiorespiratory endurance (41.79%), right arm curl strength (25%), left arm curl strength (30.79%), right hand grip strength (13.65%), left hand grip strength (9.93%), lower limb strength (46.19%), balance (49.58%), and mobility (26.37%). Measures of flexibility in the exercise group also showed improvement (right lower limb (63.57%), left lower limb (44.17%), right upper limb (36.67%), and left upper limb (63.1%) but were not statistically significant (all, $P > 0.05$). The control group did not show any significant changes ($P > 0.05$) in any variables. The data suggested that 12-week multicomponent exercise training may improve physical functioning among institutionalized elderly.

3. Comparison of mean functional activity score before and after administration therapeutic exercise

Table-5 shows that the mean functional activity score (46.30) after administration of therapeutic exercise on day 20 is higher than mean functional activity score (33.56) before administration of therapeutic exercises. The obtained 't' value is (10.19) which is significant at 0.05 level df (58). obtained't' value is higher

than the table value. Therefore it can be inferred that the therapeutic exercise had been effective in improving the functional activity of the elderly people.

Kelly (2009) conducted a meta-analysis to examine the impact of exercise and health related quality of life in older community based adults. The study included 11 randomized clinical trials (RCT) that included 617 men and women. Physical activity intervention arms for the clinical trials included strength training, aerobic training with some of them participated in both types of activities. The SF-36 PCS was the principal outcome in these RCTs. Results indicated that physical activity demonstrated statistically significant increases in physical functioning in the small to moderate range of effects. Odds ratio of 2.14 (95% CI; 1.42-3.24) was interpreted as an odds of improving in physical functioning more than 2 times greater with a physical activity intervention compared with the odds in a control group without physical activity. These differences were deemed clinically relevant, the paper also points out that the integration of combined strategies such as strength and aerobic exercise can have a larger effect.

4. Association of functional activity score of the subjects and selected demographic variables (age, sex, educational status, co morbid diseases, body mass index, previous history of fall and fracture).

Table 12 shows the association between the level of functional activity of the subject and selected variables chi-square test was computed. There was no association between level of functional activity of the group and age. The obtained χ^2 value of 2.87 at df (1) was not significant at 0.05 level. It was found that there is no association between level functional activity of the elderly group and age, sex, educational status,

co morbid diseases, BMI, previous history of fall and fracture. The obtained X^2 value for sex was 1.2 at df (1), for education status was 12.59 at df (1), for co morbid diseases was 3.94 at df (1), for body mass index was 1.12 at df (1), for previous history of fall and fracture was 0.24 at df (1) was significant at 0.05 level. There was no association between functional activity score and age, sex, educational status, co morbid diseases, BMI, previous history of fall and fracture for experimental group. So it can be inferred that therapeutic exercise has an effect in functional activity without influencing demographic variables of the samples.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATIONS

This chapter deals with the summary of the study and the conclusion drawn. It clarifies the limitation of the study. The implication and recommendation given for different areas of nursing and for the health care delivery system.

SUMMARY OF THE STUDY

This study was undertaken to determine the effectiveness of therapeutic exercises in improving the functional activity among the elderly person.

The following objectives were set for the study:

- To find out the functional status of the elderly in experimental group before and after implementing selected nursing intervention.
- To assess the pre and post test functional status of the elderly in control group.
- To evaluate the effectiveness of selected nursing intervention in improving functional status among elderly in experimental group.
- To find out the association between the post test functional status of experimental group with selected demographic variables (Age, Sex, Education status, Co morbid diseases, Body mass index and Previous history of fall and fracture.)
- To find out the association between the post test functional status of control group with selected demographic variables (Age, Sex, Education status, Co morbid diseases, Body mass index and Previous history of fall and fracture.)

The following Hypotheses were tested at 0.05 level of significant:

H₁:

The mean post test functional status score of experimental group of elderly who had selected nursing intervention will be significantly higher than mean post test score of control group.

H₂:

The mean post test functional status score of experimental group who had selected nursing intervention will be significantly higher than mean pre test score in day 10 and 20.

H₃:

There will be a significant association between mean post test functional activity score of experimental group with selected demographic variables. (Age, Sex, Education status, Co morbid diseases, Body mass index and previous history of fall and fracture.) in experimental group.

H₄:

There will significant a association between mean post test functional activity score of control group with selected demographic variable (Age, Sex, Education status, Co morbid diseases, Body mass index and previous history of fall and fracture.)

Variables studied were

Dependent variable: Functional status.

Independent variable: Selected nursing intervention (Neck mobility exercise, Manual resistance exercise, Isometric exercise).

In this study quasi experimental pretest, posttest control group research design was used and the study was conducted at Zion trust, Christian seva sangam, poongkodi old age homes in Madurai. The population of the study was old age people who were residing in the old age homes. Purposive sampling technique used to select subjects. A total of 60 subjects were selected.

The tool used for data collection was a Functional Activity Scale & outcome expectation exercises measure. The content validity of the tool established by giving to 5 experts in the field of nursing / physiotherapist and orthopedics. Modifications was done according to their recommendations.

Reliability was tested using Karl Pearson's co-efficient correlation for Functional Activity Scale ($r=0.94$). the instrument found to be reliable. Pilot study was conducted on 6 samples to find out the feasibility of conducting the study and it was found feasible.

Therapeutic exercises were taught to subjects for 20 days. functional activity was assessed before and after the therapeutic exercises on day 10 and day 20.

Descriptive statistics (viz., percentage, mean and standard deviation) and inferential statistics (viz., 't' test and chi-square) were used to analyze the data and to test hypotheses.

The significant findings of the study were

- Comparison of mean post test functional activity score of experimental group after the administration therapeutic exercises was higher than the control group post test score.
- Comparison of mean functional activity score of therapeutic exercises on day 10 was higher than the mean functional activity score of before administration of therapeutic exercises.
- Comparison mean functional activity score of therapeutic exercises on day 20 is higher than the mean functional activity score of before administration of therapeutic exercises.
- Comparison mean functional activity score of therapeutic exercises on day 20 is higher than the mean functional activity score of day 10.
- There was no association between the level of functional activity in patient with age, sex, educational status, co-morbid diseases, body mass index, previous history of fall and fracture.

CONCLUSION

The following conclusion were drawn from the study

1. The level of functional activity of the subjects with functional activity was improved significantly after therapeutic exercises.
2. Continuous administration of therapeutic exercise slowly improved the subjects functional status to partially dependent to independent status.
3. There was no association between the level of functional activity in patient with age, sex, educational status, co-morbid diseases, body mass index, previous history of fall and fracture.

IMPLICATIONS

Aging adults going from inactivity to activity, flexibility training may offer a good start towards a healthy lifestyle. This type of training may lack the high profile of cardiovascular exercise and strength training, but it can improve range of motion, decrease pain and soreness after exercise, improve posture, and decrease muscle tension. More importantly, stretching can make the difference in comfort when performing tasks such as putting a shirt or blouse on in the morning or reaching for a cup of tea or coffee. As a result, flexibility can contribute significantly to overall functional fitness, helping older adults safely and effectively accomplish independent activities of daily living. The findings of the present study support that therapeutic exercises are very safer and almost have a nil adverse effect and improving the functional status. The findings of the study have several implications on following fields.

IMPLICATION OF NURSING PRACTICE

- The findings of the study enlighten the fact that therapeutic exercises can be used to improving functional activities of elderly person.
- The study findings help the nursing personnel to include the therapeutic exercise as a nursing intervention in the management of elderly person.
- The study signifies the early institution of therapeutic exercises improvement of functional activity.
- Demonstration can be arranged for elderly regarding therapeutic exercises in selected old age homes.

IMPLICATION OF NURSING EDUCATION

- The study proved that the therapeutic exercise has effect in improving functional activities. To practice this nursing personnel need to have adequate knowledge desirable attitude and skill regarding therapeutic exercises.
- This findings would help nursing faculty to give importance for therapeutic exercises as a nursing intervention in the management of old age patient and motivate the nursing student to use this intervention in the management of this patient.
- The content should be added to the nursing curriculum so that the nursing students can come to know about therapeutic exercises and its uses in improving the functional activities of the elderly person.
- Short term courses can be started to train nurses in old age home with emphasis on therapeutic exercise.

IMPLICATION OF NURSING RESEARCH

There is need for extensive and intensive research in this area.

- One of the aims of nursing research is to expand and broaden the scope of nursing findings of this study will provide baseline data about the functional activities and therapeutic exercises it can be used for further studies in this area.
- This study also brings about the fact that more studies need to be done at different settings.

IMPLICATION OF NURSING ADMINISTRATION

- Nurse administrator should prepare procedure manual protocols regarding therapeutic exercises and can be used in old age home.
- Clinical nurses and nurse educators should be given an in-service education to update the knowledge regarding therapeutic exercises.
- Periodic conference, seminar, symposium, can be arranged for nursing personnel regarding care of old age person.

LIMITATION

The limitation of the study

- The sample size was 60. Each finding should be generalized with cautions.
- The settings of the study were chosen due to the researches familiarity. Due to this methodological limitation the findings can be generalized only to the selected home.

RECOMMENDATION

- Similar kind of the study can be conducted for a longer group to generalize the findings.
- A longitudinal study can be conducted to assess the effect of therapeutic exercise to improve the functional activities.
- The study can be conducted by using other types of exercises.
- Similar kind of study can be conducted for patients who are having orthopedic disorder.

- The same study can be conducted by administering the therapeutic exercises in improving other variables like cardiac parameters, respiratory and musculo skeletal performance.

SUMMARY

This chapter had dealt with the summary of the study, conclusion, implication of nursing field, limitations of the study and recommendations of future studies.

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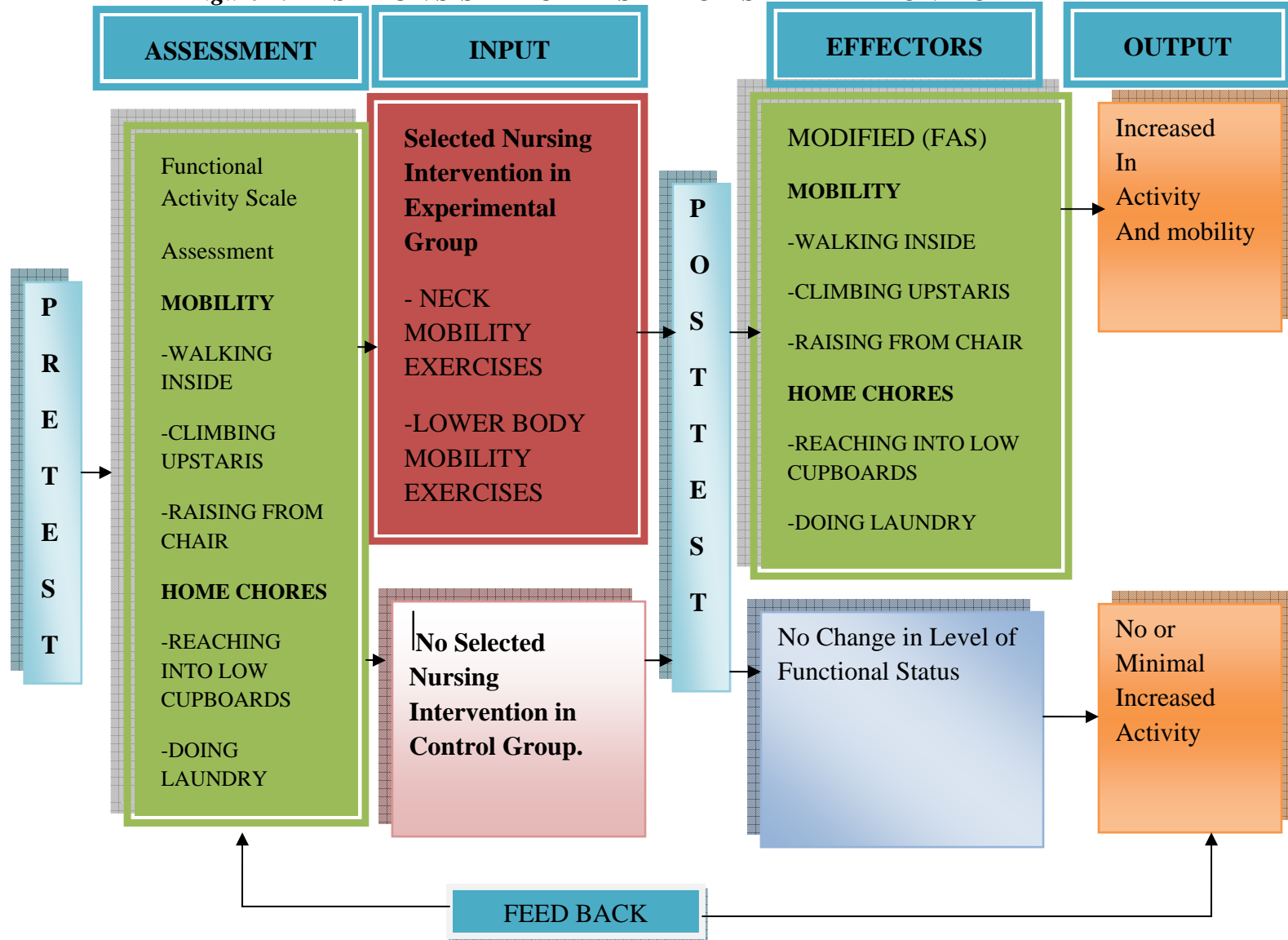
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CONCEPTUAL FRAME WORK

Figure 1: BASED ON SISTER CALLISTA ROY'S ADAPTATION MODEL



APPENDIX –I**COPY OF LETTER SEEKING PERMISSION
TO CONDUCT THE STUDY IN SELECTED OLD AGE HOME,
MADURAI**

Dr. NALINI JEYAVANTH SANTHA
Principal.

4/235, COLLEGE ROAD
THASILDAR NAGAR
MADURAI – 625 020
PHONE: 2534593
Date: 01.06.2010

Ref. UT: SHNC: 2010
To

THE DIRECTOR,

Respected Sir / Madam,

Sub: Sacred Heart Nursing College, Madurai – Project work of
M. Sc (Nursing) student – permission requested – reg.

We wish to state that **Mr. Earnest Rajasingh**, Final year M. Sc (Nursing) student of our college has to conduct a Research project, which is to be submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of University requirements.

The topic of research project is “An experimental study to evaluate the effectiveness of selected nursing interventions in improving functional status among elderly with impaired mobility residing in selected old age home at Madurai.

We therefore request you to kindly permit him to do the research work in your organization under your valuable guidance and suggestions.

Thanking you,

Yours faithfully,

Principal

SACRED HEART NURSING COLLEGE

APPENDIX - II**LETTER REQUESTING OPTIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY AND VALIDITY OF TOOL**

From

M. Earnest Rajasingh,
MSc (N) II year,
Sacred Heart Nursing College,
Madurai.

To,

Respected Sir/Madam

SUB: Requesting opinions and suggestion of experts for the content validity and validity of tool.

I am a post graduate student (Medical SurgicalSpeciality) of The Sacred Heart Nursing College. I have selected the below mentioned topic of the research project submitted to DR.M.G.R. Medical university, Chennai as a fulfilment of Master of Science in nursing.

TITLE OF THE TOPIC:

“An experimental study to evaluate the effectiveness of selected nursing intervention in improving functional status among elderly with impaired mobility residing in selected old age homes in Madurai”.

With regard to this may I kindly request you to content and validate my tool for its relevancy. I am enclosing the objectives of the study. I would be highly obliged and remain thankful if you could validate and send it as early as possible.

Thanking you

Place : Madurai

Yours Faithfully

Date :

(M. Earnest Rajasingh)

APPENDIX – III

LIST OF EXPERTS CONTENT VALIDITY OF INTERVENTION OF SLEEP INTERVENTION STRATEGIES

1. Dr.R. Sathish, MBBS, D. (Ortho)
Shenbagam Anna Nagar,
Madurai-20.
2. Dr. Mrs. Nalini Jeyavanth Santha, M.Sc (N), Ph. D
Principal
Sacred Heart Nursing College, Madurai
3. Mrs. Jeya Thanga Selvi, M. Sc (N), Ph. D.,
Vice Principal
CSI Jeyaraj College of Nursing,
Madurai.
4. Mr. David Packianathan, M. BT
President,
Zion Trust,
Madurai.
5. Prof. Devakirubai, M. Sc (N), Ph. D.,
Vice Principal,
Sacred Heart College of Nursing,
Madurai.

APPENDIX - IV

Demographic Data

TOOL – I

- Aim : To collect the over all information about the personal data
- Section A : Questionnaire to get the demographic data
- Instruction : This questionnaire will be administered by the investigator to the clients.

DEMOGRAPHIC PROFILE

1. Age in years

- a)60-65
- b)66-70
- c)71-75
- d)76-80

2. Sex

- a) Male
- b) Female

3. Educational Status

- a) Illiterate
- b) literate
 - i. Primary School level
 - ii. Middle School level
 - iii. High school level
 - iv. Higher secondary level
- b) Under graduate
- c) Post graduate

4. Co morbid disease

a) Yes

b) No

5. BMIWeight in kg /Height (m)²**6. Previous History of fall and fracture → No/yes**

If yes → specify part

APPENDIX V

TOOL II

Functional Activity Scale

Aim : To assess the functional activities of the clients before and after administration of therapeutic exercises

Instructions : The investigator will record the functional activity level by using the modified form of functional status index

		Pre Test	Post Test	
			10	20
	MODIFIED FUNCTIONAL STATUS INDEX			
	1. Mobility			
	a) Walking Inside			
	• Assistance			
	Independent	5		
	Uses devices	4		
	Uses human assistance	3		
	Uses devices & human assistance	2		
	Unable or unsafe to do the activities	1		
	• Pain			
	No pain	4		
	Mild pain	3		
		2		
		1		

	Moderate pain	0		
	Severe pain			
	Unbearable pain	4		
	• Difficulty	3		
	No difficulty	2		
	Mild difficulty	1		
	Moderate difficulty			
	Severe difficulty			
	<i>b) Climbing upstairs</i>	5		
	• Assistance	4		
	Independent	3		
	Uses devices	2		
	Uses human assistance	1		
	Uses devices & human assistance			
	Unable or unsafe to do the	4		
	activities	3		
	• Pain	2		
	No pain	1		
	Mild pain	0		
	Moderate pain			
	Severe pain	4		
	Unbearable pain	3		
	• Difficulty	2		
	No difficulty	1		
	Mild difficulty			

	Moderate difficulty		
	Severe difficulty	5	
	c) <i>Raising from a chair</i>	4	
	• Assistance	3	
	Independent	2	
	Uses devices	1	
	Uses human assistance		
	Uses devices & human assistance	4	
	Unable or unsafe to do the	3	
	activities	2	
	• Pain	1	
	No pain	0	
	Mild pain		
	Moderate pain	4	
	Severe pain	3	
	Unbearable pain	2	
	• Difficulty	1	
	No difficulty		
	Mild difficulty		
	Moderate difficulty		
	Severe difficulty	5	
	2. Home Chores	4	
	a) <i>Reaching into low cupboards</i>	3	
	• Assistance	2	
	Independent	1	

	Uses devices			
	Uses human assistance	4		
	Uses devices & human assistance	3		
	Unable or unsafe to do the activities	2		
	• Pain	1		
	No pain	0		
	Mild pain			
	Moderate pain	4		
	Severe pain	3		
	Unbearable pain	2		
	• Difficulty	1		
	No difficulty			
	Mild difficulty			
	Moderate difficulty	5		
	Severe difficulty	4		
	<i>b) Doing Laundry / Cleaning the vehicle</i>	3		
	• Assistance	2		
	Independent	1		
	Uses devices			
	Uses human assistance	4		
	Uses devices & human assistance	3		
	Unable or unsafe to do the	2		
	activities	1		
	• Pain	0		
	No pain			

	Mild pain	4		
	Moderate pain	3		
	Severe pain	2		
	Unbearable pain	1		
	• Difficulty			
	No difficulty			
	Mild difficulty			
	Moderate difficulty			
	Severe difficulty			

APPENDIX - VI

TOOL- III

Outcome Expectation Exercises Measure.

The feedback of the elderly people in experimental group through the outcome expectation exercises measure.

S.no	Characteristics	Yes	No
	Continues practice of 20 days exercise program		
Physical happiness			
1.	Improved your endurance in performing daily activity		
2.	Made you feel better physically		
3.	Made your muscle stronger		
Mental happiness			
4.	Changed your mood better in general		
5.	Helped you to feel less tired		
6.	Makes you to enjoy doing exercise		
7.	Gives you a sense of personal accomplishment		
8.	Made you become more mentally alert		

APPENDIX - VII

INTERVENTION STRATEGIES TO IMPROVE THE FUNCTIONAL STATUS:

Neck mobility exercise, Manual resistance exercise, Isometric exercise

A. NECK MOBILITY (Three movements)

1. Flexion/Extension - Tuck your chin into your chest, and then lift your chin upward as far as possible. Repeat for six to 10 reps.

2. Lateral Flexion - Lower your left ear toward your left shoulder and then your right ear to your right shoulder. Six to 10 reps.

3. Rotation - Turn your chin laterally toward your left shoulder keep for three seconds return the head to neutral position and then rotate it toward your right shoulder for six to 10 reps.

B. EXERCISE FOR UPPER LIMB

MANNUAL RESISTANCE EXERCISE

Shoulder complex flexion

Procedure

Patient lying on supine position. Raise the arm above the shoulder. Raise against the resistance applied by the examiner for 2-3 minutes.

Effects

To stabilizes ball & socket joint.

To improves the range of motion of shoulder joint.

It strengthen the shoulder flexor muscle (Eg- Pectralis & Deltoid)

It improves the functional activity for ADL

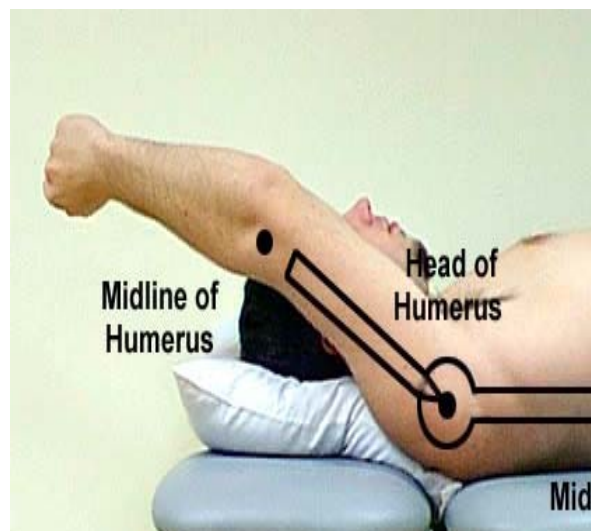


Figure1: Shoulder complex flexion

Shoulder complex abduction

Procedure

Patient lying in supine position. Rotate the shoulder Laterally (Externally).

Move the arm medially against the resistance repeat 2-3 minutes

Effects

To stabilizes glenohumeral joint.

To improves the range of motion of shoulder joint.

It strengthen the shoulder flexor muscle (Eg. Pectoralis & Deltoid, Brachialis, Coracobrachialis)

It improves the functional activity for ADL.

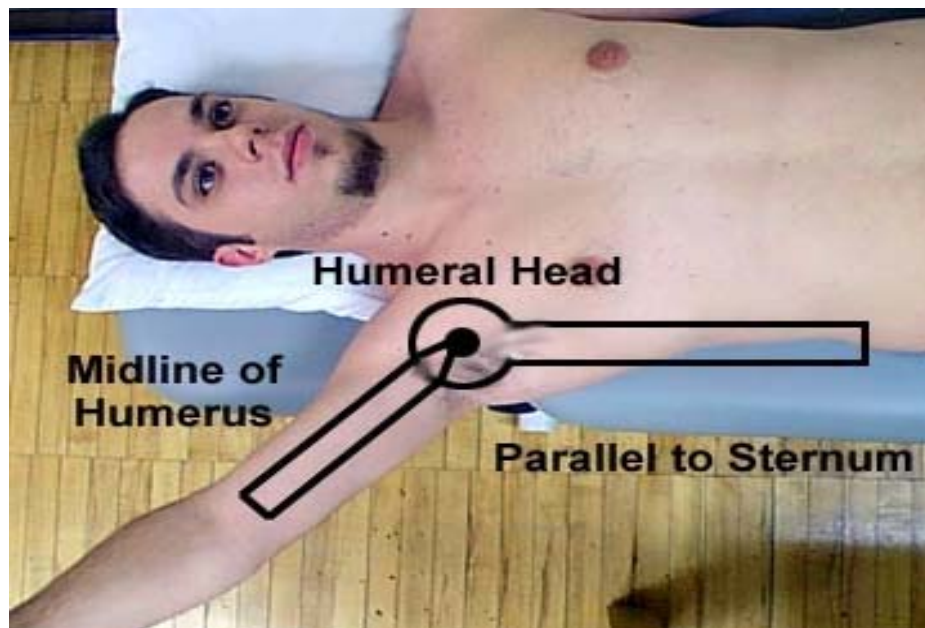


Figure 2: Shoulder complex abduction

Shoulder medial rotation

Procedure

Patient lying in supine position. Abduct the shoulder at 90° . Move the arm downward against the resistance. Repeat 2-3 minutes

Effects

To stabilizes Shoulder socket Joint.

To improves the range of motion of shoulder joint.

It strengthen the shoulder flexor muscle (Eg. Pectoralis & Deltoid, Brachialis, Coracobrachialis)

It improves the functional activity for ADL

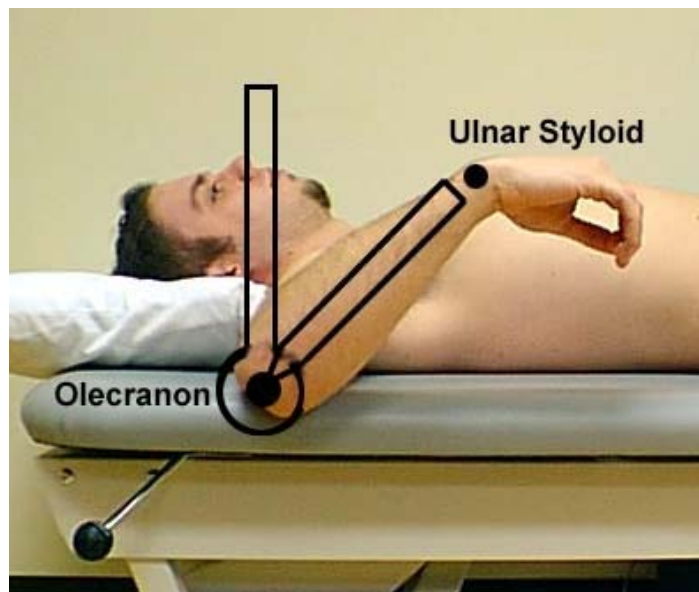


Figure 3: Shoulder medial rotation

Elbow Flexion

Procedure

Patient lying in supine position. Flex the neutral elbow position. Extended the arm against resistance. Repeat 2-3 minutes

Effects

To stabilizes Elbow joint.

To improves the range of motion of shoulder joint.

It strengthen the elbow flexor muscle (Eg.Brachioradialis, Palmaris longus, flexor carpi radialis, Flexor carpi ulnaris)

It improves the functional activity for ADL

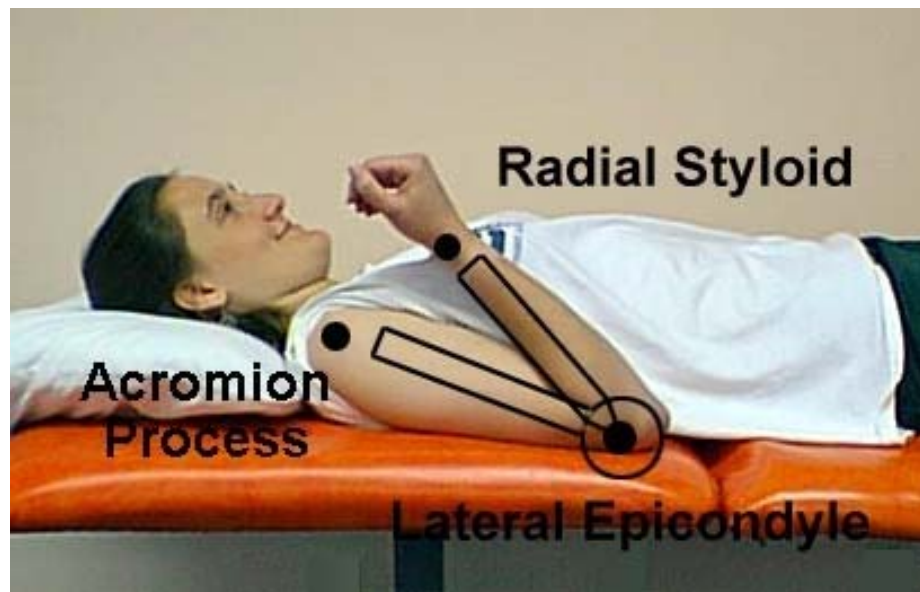


Figure 4: Elbow Flexion

Elbow Extension

Procedure

Patient lying in supine position. Keep the forearm supinated with elbow extended. Flex the arm against resistance. Repeat 2-3 minutes

Effects

To stabilizes Elbow joint.

To improves the range of motion of shoulder joint.

It strengthen the Elbow flexor muscle (Eg.Brachioradialis, Palmaris longus, flexor carpi radialis, Flexor carpi ulnaris)

It improves the functional activity for ADL

SUPINATION

Procedure

Patient in sitting position. Keep the elbow flexed at 90° . Supinate the forearm.

Move the forearm against resistance. Repeat 2-3 minutes

Effects

To stabilizes wrist joint.

To improves the range of motion of Forearm muscle.

It strengthen the wrist flexor muscle (Eg.Brachioradialis, Palmaris longus, flexor carpi radialis, Flexor carpi ulnaris)

It improves the functional activity for ADL

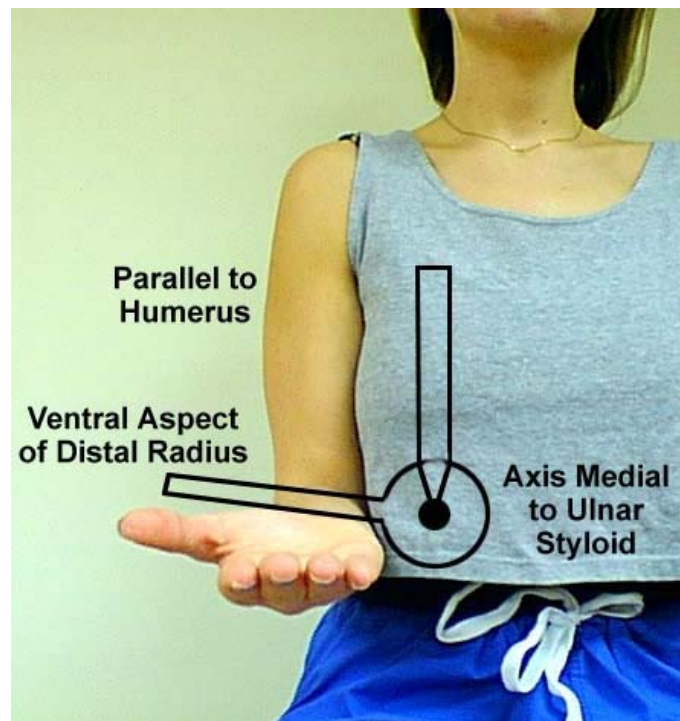


Figure 5: SUPINATION

PRONATION

Procedure

Patient in sitting position. Flex elbow at 90° . Pronate forearm. Move it against the resistance applied by the examiner. Repeat 2-3 minutes

Effects

To stabilizes Elbow joint.

To improves the range of motion of Forearm muscle.

It strengthen the wrist flexor muscle (Eg.Extensor pollicis, extensor indicis,Supinator, flexor carpi radialis, Flexor carpi ulnaris)

It improves the functional activity for ADL.

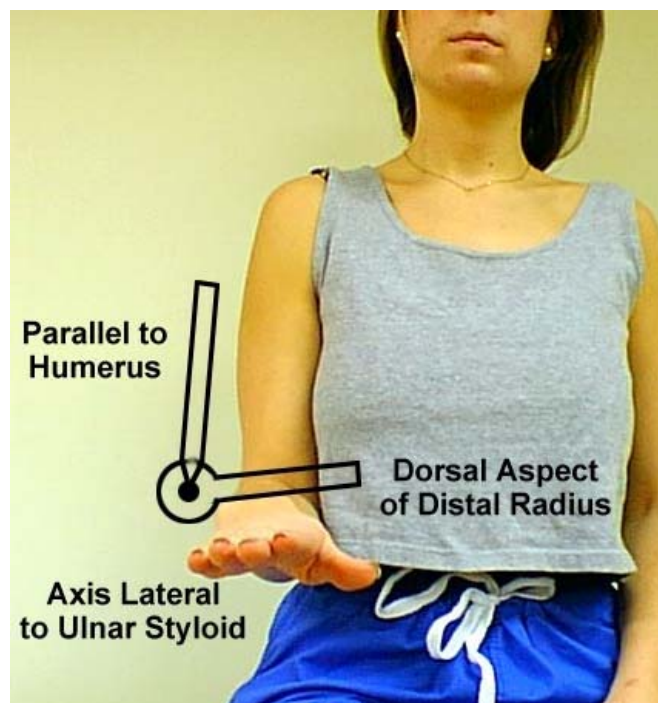


Figure 6: PRONATION

WRIST FLEXION

Procedure

Patient in sitting position. Stabilise the forearm on a table. Flex the wrist. Extended the wrist against the resistance offered by the examiner. Repeat 2-3 minutes

Effects

To stabilizes wrist joint.

To improves the range of motion of wrist joint.

It strengthen the wrist muscle (Pronator quadratus)

It improves the functional activity for ADL

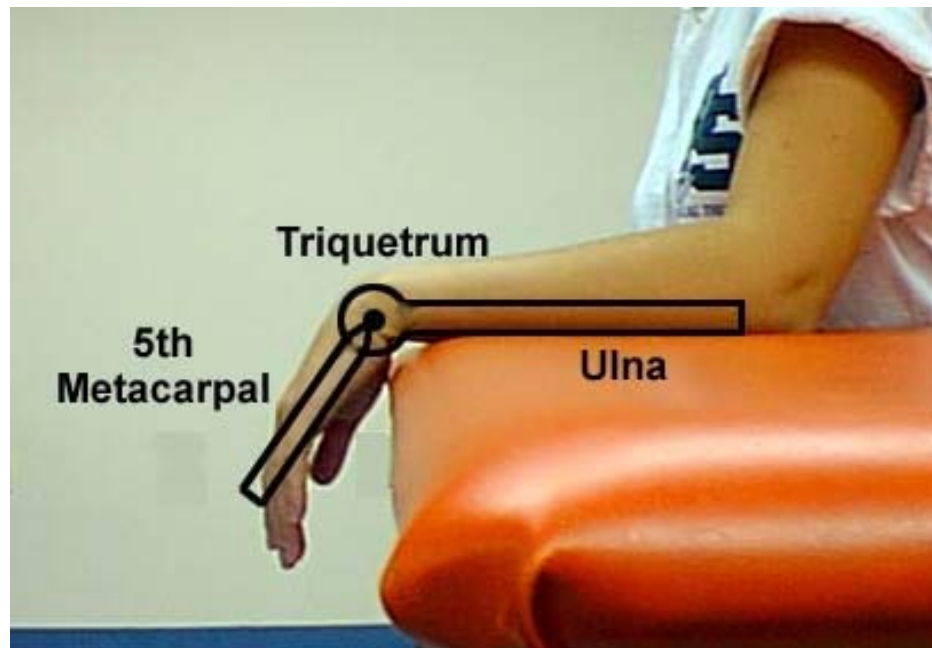


Figure 7: WRIST FLEXION

WRIST EXTENSION

Procedure

Patient in sitting position. Stabilise the forearm on a table. Extend the wrist.
Flex the wrist against the resistance offered by the examiner. Repeat 2-3 minutes

Effects

To stabilize wrist joint.

To improve the range of motion of wrist joint.

It strengthens the wrist muscle (Pronator quadratus)

It improves the functional activity for ADL

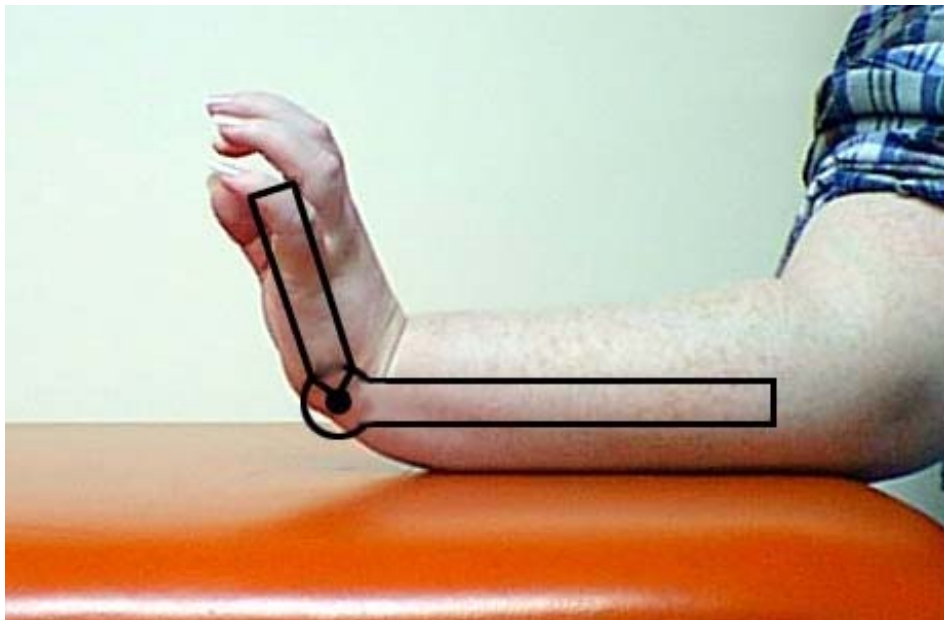


Figure 8: WRIST EXTENSION

ULNAR EXTENSION

Procedure

Patient in sitting position. Stabilise the forearm on a table. Extend the wrist.

Flex the wrist against the resistance offered by the examiner. Repeat 2-3 minutes

Effects

To stabilizes wrist joint.

To improves the range of motion of Intrinsic muscles of the hand.

It strengthen the Intinsic flexor muscle (Abductor Digiti Minimi, Flexor Digiti Minimi)

It improves the functional activity for ADL.

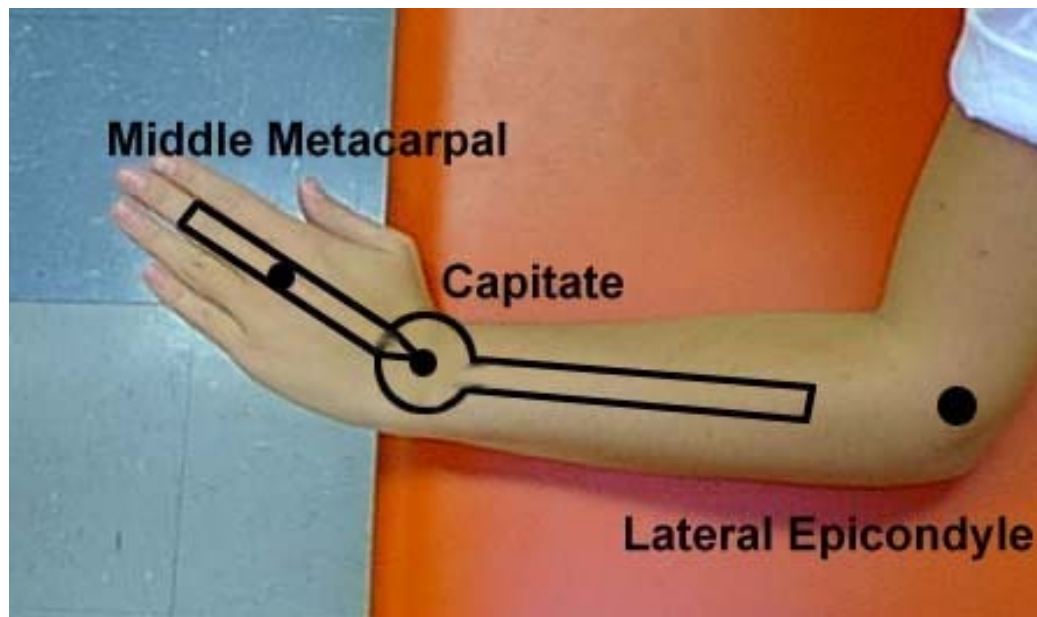


Figure 9: ULNAR EXTENSION

RADIAL EXTENSION

Procedure

Patient in sitting position. Stabilise the forearm on a table. Extend the wrist.
Flex the wrist against the resistance offered by the examiner. Repeat 2-3 minutes.

Effects

To stabilizes wrist joint.

To improves the range of motion of Intrinsic muscle of the hand.

It strengthen the shoulder Intrinsic muscle (Abductor pollicis Brevis, Flexor pollicis brevis)

It improves the functional activity for ADL

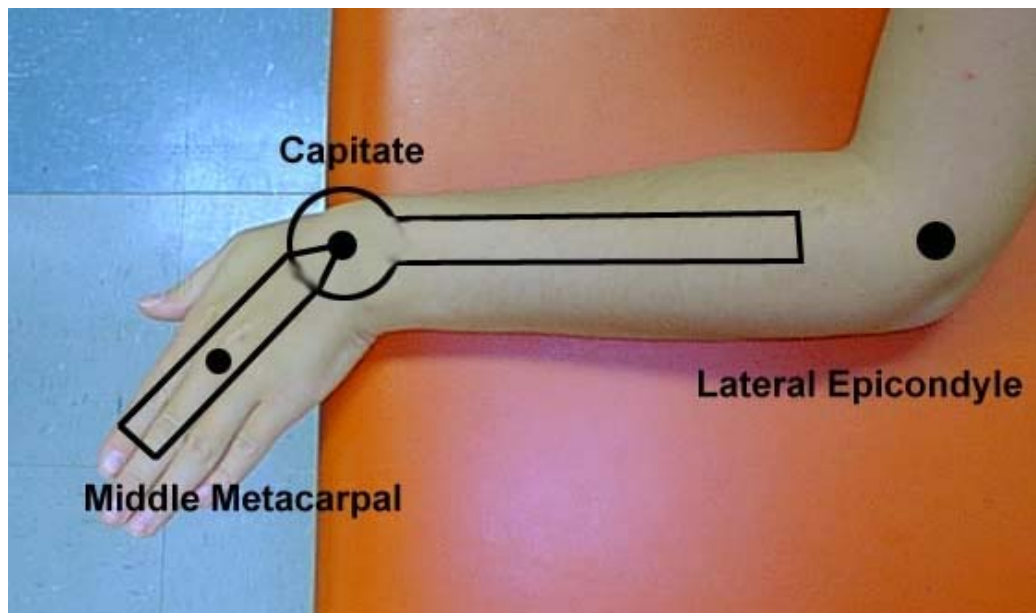


Figure 10: RADIAL EXTENSION

FINGER GRIPING EXERCISE

Patient in sitting position. Stabilise the forearm on a table. Ask to do the patient squish the soft ball 2-3 minutes.

Effects

To stabilizes Tendon of flexor digitorum superficialis.

To improves the range of motion Finger.

It strengthen the digitorum superficialis.

It improves the functional activity for ADL.

C. EXERCISE FOR LOWER LIMB

ISOMETRIC EXERCISE

Quadriceps Strengthening – Basic Exercises

Quadriceps strengthening exercises should be performed approximately 10 times, 3 times daily. As your quadriceps strength improves, the exercises can be progressed by gradually increasing the repetitions and strength of contraction provided they do not cause or increase pain.

Static Inner Quadriceps Contraction

Procedure

Tighten the muscle at the front of your thigh (quadriceps) by pushing your knee down into a towel. Put your fingers on your inner quadriceps (VMO) to feel the muscle tighten during contraction. Hold for 5 seconds and repeat 10 times as hard as possible pain free.

Effects

It improves the strengthening of the quadriceps muscles.

It also helps to restore the range of motion.



Figure 11: Static Inner Quadriceps Contraction

Quadriceps over Fulcrum

Procedure

Begin this quadriceps strengthening exercise lying on your back with a rolled towel or foam roll under your knee and your knee relaxed. Slowly straighten your knee as far as possible tightening the front of your thigh (quadriceps). Hold for 5 seconds then slowly lower back down. Repeat 10 times as hard as possible pain free.

Effects

It improves blood circulation.

It helps to improve the muscle integrity.

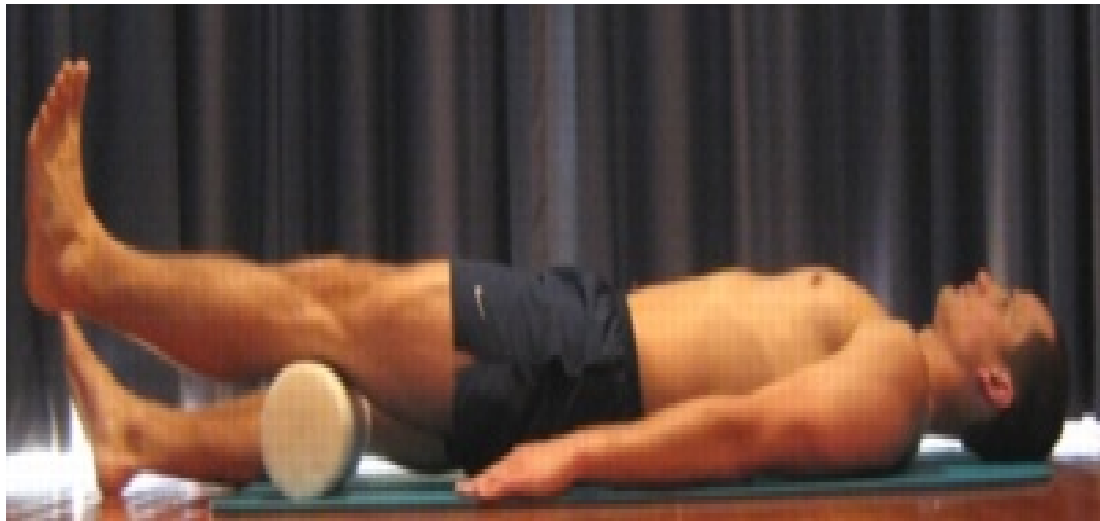


Figure 12: Quadriceps over Fulcrum

Hamstring Strengthening Exercises

The following hamstring strengthening exercises are designed to improve the strength of the hamstring muscles.

Static Hamstring Contraction

Procedure

Begin this hamstring strengthening exercise in sitting with your knee bent to about 45 degrees. Press your heel into the floor tightening the back of your thigh (hamstrings). Hold for 5 seconds and repeat 10 times as hard as possible pain free.

Effects

It improves the strengthen the hamstrings muscle.

To restore range of motion (ROM) to prevent later permanent limitation of flexion or extension



Figure 13: Static Hamstring Contraction

Hamstring Strengthening – Intermediate Hamstring Exercises

The following intermediate hamstring strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, to allow muscle recovery. As your strength improves, the hamstring exercises can be progressed by gradually increasing the repetitions or resistance of the exercises provided they do not cause or increase pain.

GLUTEAL EXERCISE

Hip Extension Lying

Procedure

Gluteal strengthening exercise lying on your stomach in the position demonstrated. Keeping your knee straight, slowly lift your leg, tightening your bottom muscles (gluteals). Hold for 2 seconds then slowly lower your leg back down. Repeat 10 times provided it is pain free.

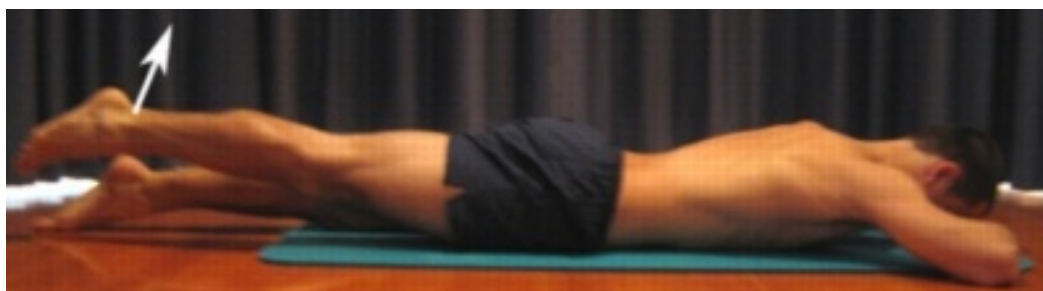


Figure 14: Hip Extension Lying

HIP ABDUCTION LYING

Procedure

Begin this gluteal strengthening exercise lying on your side in the position demonstrated. Keeping your back and knee straight and foot facing forwards, slowly take your leg to the side, tightening the muscles at the side of your hip (gluteals). Make sure you keep your pelvis still. Hold for 2 seconds then slowly lower the leg back down. Repeat 10 times provided it is pain-free.



Figure 15: HIP ABDUCTION LYING

USES OF ISOMETRIC EXERCISE

- **To restore range of motion (ROM)** to prevent later permanent limitation of flexion or extension
- **To maintain muscle responsiveness** and limit inhibition in the early phases and actual wasting in the later stages
- **To free adhesions** so that they do not organise into thicker scar tissue, which might lock up the joint
- **To rebuild muscle strength** to restore function and also to stabilise the joint and protect it from further injury
- **To restore gait patterns** to prevent strain in the back or hip or the other leg
- **To restore proprioception** or internal spatial awareness in the knee, to prevent damaging it again
- **To build endurance** to strengthen bones and the cardiovascular system (heart and lungs)