

“Impact of Mild Level Exercises on Gait, Balance, Functional Status to Prevent Fall Among Elderly in Selected Areas of Belagavi District, Karnataka – A Study Protocol”

Shakeelahmed Mujawar, Dr. Tukaram Zagade

Department Medical Surgical Nursing, Krishna Institute of Nursing Sciences, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India

ABSTRACT

Context: Falls, a frequent and preventable cause of morbidity, raise the likelihood of functional independence loss and the requirement for hospitalization and institutionalization, placing a strain on the healthcare system. The annual expenses for acute care linked to fractures from falls are estimated at \$10 billion, despite the fact that the entire expenditures for acute care connected to falls remain unclear. **Aims:** To administer the mild level exercise programme of elderly among experimental group and to determine the effect of mild level exercise program on improvement of gait, balance and functional status of elderly among experimental group. **Settings and Design:** The samples from the selected rural areas of Belagavi district were selected using convenient sampling technique. A quantitative approach with post test only control group design was adopted for the study. **Subjects and Methods:** Elderly above the age of 60 years of selected rural areas of gokak taluka belagavi district and total 250 samples selected by using convenient sampling technique and my research approach is Quantitative Research Approach, Research design is Post test only control group design and Sampling technique is Non-Probability; Convenient Sampling Technique respectively. **Conclusions:** The mild level exercise program was very much effective and the elders had great interest to learn and to do the exercises to improve their gait, balance, functional and to reduce the incidence of fall. Continuing nursing education programs can be conducted in hospitals and community regarding the importance of low intensity exercise program in improving gait, balance, functional status and in reducing the incidence of falls in the elderly people.

Key Words: Mild level exercises, gait, balance, functional status, elderly people

Introduction

The term "fall" refers to "an event that results in the person coming to rest inadvertently on the ground or other lower level not as a result of a major intrinsic event or overwhelming hazard." According to this definition, a fall is "an event that results in the person coming to rest inadvertently on the ground or other lower level." One of the most common and serious issues affecting the elderly population, falls are also the leading cause of injury among people of this age. About one third of elderly people over the age of 60 who are otherwise healthy fall each year, and roughly half of those people will fall multiple times over the course of their lives.¹

There were an estimated 605 million elderly people in the globe in 2002, 400 million of whom lived in low-income nations. More than 1.2 billion old people are projected to exist by 2025, with 840 million of them living in low-income nations. Even though the proportion of elderly people in India's population is lower than that of wealthy nations, the country nonetheless has a sizable elderly population in absolute terms. According to the SRS

(Sample Registration System) study, 7.2% of the overall population was over 60 years old in 2003.²

People above the age of 60 are becoming more prevalent very quickly, particularly in India. With 76.6 million citizens aged 60 or over, India ranks second in the globe, making up 7.7% of the total population. Due to the social and cultural changes occurring throughout Indian society, this community is dealing with a number of issues. Falls are one of the primary difficulties in the elderly and pose a big problem to health and well being of older persons. There is little research on ageing in India, despite the fact that the factors of health have been extensively studied in Western nations.³

The majority of health care resources are used by the elderly. Although people over the age of 65 make up around 11% of the population in America, they occupy 345 of the beds in acute care hospitals and spend 295 of all personal healthcare costs. The need for senior health care is a major concern since by 2020, there will be twice as many people over 65 as there are now.⁴

Gait, balance, and functional status changes are all correlated with ageing. Studying these motor processes may

help to spot circumstances when falling might be a possibility. Because to their prevalence and potential for negative physical, psychological, and social effects, such occurrences pose a severe threat to public health. A major health concern for the senior population is falling. Half of the community's residents over 65 years old who fall each year—between 20 and 30 percent of them—do so more than once.⁵

Falls, a frequent and preventable cause of morbidity, raise the likelihood of functional independence loss and the requirement for hospitalization and institutionalization, placing a strain on the healthcare system.⁶ the annual expenses for acute care linked to fractures from falls are estimated at \$10 billion, despite the fact that the entire expenditures for acute care connected to falls remain unclear.⁴

Poor balance, unsteady stride, diminished muscle strength in the extensors and flexors of the knees and ankles, as well as somewhat diminished plantar dorsiflexors, are all factors that contribute to falls. The capacity of elderly people to keep their balance is impaired by a variety of age-related changes. Low-intensity exercise increases muscle strength and flexibility. Sufficient muscle strength and range of motion are required for a person to maintain balance and walking.⁷

On the other hand, some studies have failed to duplicate these fundamental relationships or even seen the opposite impact of increasing risk of injuries with increased physical activity or function. Several research have shown that workouts are beneficial in lowering the number of falls.⁸ Injuries from falls happen frequently in India. There aren't many studies on it that were conducted in India. Additionally there are research findings of which suggested that exercises are raising the risk of fall or making no difference in the number of falls. As a result, the researcher considered it important to explore how low-intensity exercise programmes affect senior people's gait, balance, functional status, and incidence of falls and to design suitable interventional health treatments that might be suggested to nursing homes.

Study setting

This study being carried out in selected rural areas of Gokak taluka of Belagavi district, Karnataka state, were selected using convenient sampling technique.

Sample size

In this study sample size is 250 elderly used.

Sample Size Calculation Based on Prevalence:

Formula:

$$n = \frac{(Z_{\alpha} + Z_{\beta/2})^2 \sigma^2}{(\delta - |\mu - \mu_0|)^2}$$

Where,

α = Significance Level = 5%

β = Type-II Error = 0.20

$|\mu - \mu_0|$ = Acceptable difference between sample mean and known or population mean. Here we take sample mean of Age based on given references is 64. And therefore, the allowable mean difference is zero.

σ^2 = Population variance= 3

δ = Equivalence Limit = 0.325

Based on the given parameter values of the given references, the minimum sample size required for study is 244.

So approximate 250 samples will be going to take in this study.

Study population and inclusion and exclusion criteria

The study population includes **ELDERS**: Refers to the elders who are more than 60 years old and are more prone to have falls due to age related disturbances in gait and balance and functional instability.

And Inclusive Criteria- Elders:

Elderly aged above 60 years willing to participate in the exercise program.

Exclusive Criteria- Elders:

Who have chronic cardiac or pulmonary disease, terminal illness, severe joint pain, dementia, progressive neurological disorders?

Sampling methods

The samples for present study will be recruited from selected villages from gokak taluka, Karnataka. Two stage cluster sampling technique will be used, to select required number of samples. In the first stage three villages will be randomly selected from gokak taluka, and in second stage required number of samples will be recruited by convenient sampling method.

Tools

1. Performa for selected personal variables

▶ This consists of Age, gender, work, illness, number of meals taken per day, incidence of falls during last one month, and frequency of falls.

2. Berg balance scale

▶ The Berg balance scale is a standardized scale, developed for assessing the Balance. It consists of 14 items, each item having the score from 0 - 4 and the score ranges from 0-56.

3. Performance oriented mobility assessment scale for gait

▶ The Performance oriented mobility assessment scale developed by Tinetti, Williams and Mayewski in 1986 for gait is a standardized scale. It consists of 8 items and the score range is 0-12.

4. Functional status scale

- ▶ This scale is a standardized scale, for assessing the functional status. It consists of 6 items, and the range of score is 0-6. It uses Katz Index of Independence in Activities of Daily Living for grading the independence level, which grade score 5- 6 as Highly Independent 2- 4 as partially dependent 0- 1 as Highly dependent.

Subjects and Methods

Study design

This study is Observational study comprising of 250 samples and used research Approach is Quantitative Research Approach, and the current study used research Design is Post test only control group design and adopted sampling technique was Non-Probability; Convenient Sampling Technique respectively.

Study duration

Ongoing study at time of this report and is being carried out for 3 years.

Tools for assessment of Level Exercises on Gait, Balance, Functional Status

The data will be collected from selected samples by using berg balance scale, for balance, performance oriented mobility assessment scale for gait, and functional status scale and these observations will be done by researcher in home visits.

Education and exercise program

Low intensity exercise programme will be administered for experimental group and post test data will be collected, and post test data will be collected from control group without any intervention. Collected data will be analyzed by using appropriate statistical methods.

Furthermore these exercises should be done six times each holding for five seconds and return to the starting position. The following exercise are followed, Single Limb Stance, Walking Heel to Toe, Back Leg Raises, Side Leg Raise, Balancing Wand, Marching in Place, Toe Lifts, Shoulder Rolls, and Hand and Finger Exercises, Elderly had 3 sessions of Low Intensity Exercise program for 30 minutes per week for a period of 4 weeks under the supervision of the researcher.

Recruitment of the study participants

After getting permission from the respective authority (Gram Panchayat Permission), the primary information (name, address, contact number, age etc) is obtained. And then, these individuals will be approached at their residence. And then, 250 participants will be included in the study.

Data collection and management

The elderly selected for the study was 250 elders, The selected 250 elderly will be divided into two groups A and B, Group had 125 elderly each, Group A had intervention on Monday, Wednesday, and Friday, Group B had intervention on Tuesday, Thursday and Saturday, The intervention will be demonstrated by the researcher and it

was re-demonstrated by the elderly under researcher's supervision, Intervention will be given daily for a period of 4 weeks, and finally Post test was conducted by the researcher after 4 weeks of Low Intensity Exercise Program only experimental group.

Ethical considerations

The present study is approved by the Institutional Ethics Committee of Krishna Institute of Medical Sciences, deemed to be university, Karad (Ref. No. KIMSDU/IEC/06/2022 Dated, 23.06.2022) Permission from Gram Panchayat Chairman of Three villages has been obtained. Detailed information about nature and objectives of the study will be provided to the study participants. Written informed consent will be obtained during the study.

Discussion

In the present study found that, there is significant difference in post test gait, balance and functional scores of elders among experimental and control groups after intervention indicating improvement of gait among the participants of experimental group after undergoing mild level exercises program. The findings of the current study lend credence to the idea that even moderate physical activity is an essential component of fall prevention. Falls are a leading cause of fractures, which can result in hospitalization, surgical procedures, and prolonged immobilization, all of which drive up the cost of medical care on a national scale. Mild levels of exercise appear to lend credence to the concept that fall prevention must include moderate physical activity. In contrast, a study conducted by Lee et al. (2017) investigated the effectiveness of exercise interventions on the rate of falls and the number of fallers that occurred in care facilities. The researchers found significant differences between all exercise interventions and control groups in the rate of falls; however, they did not find any differences in the number of fallers that occurred between all exercise interventions and control groups. In a similar vein, Zhao et al. (2016) demonstrated that exercise had a beneficial impact on the reduction of fall-related fractures, along with improvements in the rate of falls and leg strength in older people. Despite these findings, the researchers reported that exercise had only a marginally beneficial effect on balance. Study findings also support the findings of the study conducted by Tricco et al. (2017) which showed that exercise was associated with a lower risk of injurious falls when compared with the standard of care. However, the type of physical activity that is used to reduce falls should be selected on the basis of patient and carer values.

Conclusion

These all points triggered us to take this elderly and low intensity exercise program and its aspects for the study and need of awareness among everyone (Especially elderly individuals), also using exercises to have impact on symptoms and eventually leads to increased quality of life.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Thaweewannakij T, Suwannarat P, Mato L, Amatachaya S. Functional ability and health status of community dwelling late age elderly people with and without a history of falls. *Hong Kong Physiotherapy Journal*. 2016 Jun 30; 34:1-9.
2. Park K. Park's test book of preventive and social medicine. 19th ed. Bhanot publishers 2007: 475-76.
3. Smeltzer SC, Bare BG. *Medical Surgical nursing*, 10th edition. Philadelphia: Lippincott; 2000: 188-216.
4. D'souza SA, Shringarpure A, Karol J. circumstances and consequences of falls in Indian older adults. *Indian journal of occupational therapy* 2008 April; XXXX (1): 3-11.
5. VAHI (1997), report of the independent commission on health in India, Chapter 14, Health problem of specialized group.
6. Sunderlal, Adarsh, Panakaj. Text book of community medicine preventive and social medicine. 2nd ed. CBS publishers, New Delhi: 730-31.
7. Saforzo GA, McManis BG, Black D, Luniewski D, Scriber KC. Resilience to exercise detraining in healthy older adults. *Journal of American geriatric society* 1995 March; 43(3): 209-215.
8. Elizabeth EH, Soeken K, Spellbring. A meta-analysis of fall prevention programs for the elderly. *Nursing research* 2002 February/ January; 51 (1): 1-8.
9. Lee S.H., Kim H.S. Exercise Interventions for Preventing Falls Among Older People in Care Facilities: A Meta-Analysis: Exercise Interventions for Preventing Falls among Older People. *Worldviews Evid. Based Nurs*. 2017; 14:74-80. Doi: 10.1111/wvn.12193.
10. Zhao R., Feng F., Wang X. Exercise interventions and prevention of fall-related fractures in older people: A meta-analysis of randomized controlled trials. *Int. J. Epidemiol*. 2016;46:149-161. Doi: 10.1093/ije/dyw142.
11. Tricco A.C., Thomas S.M., Veroniki A.A., Hamid J.S., Cogo E., Strifler L., Khan P.A., Robson R., Sibley K.M., MacDonald H., et al. Comparisons of Interventions for Preventing Falls in Older Adults: A Systematic Review and Meta-analysis. *JAMA*. 2017; 318:1687. Doi: 10.1001/jama.2017.15006.