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EFFECTIVENESS OF EXERCISE PROGRAMME ON FALL RISK PREVENTION AMONG OLDER ADULTS

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[1]Prof.Dr.K.Latha,[2]Prof.Dr.Shaveta Sharma ,[3]Anupam Kumari, [4]Sikha Singh, [5]Sangita Kumar, [6]Saurabh Kumar, [7]Satyam Kumar

[1]Dean cum Principal, [2]Vice Principal, [3,4,5,6,7]B.Sc. Nursing Student,
[1]Obstetrics and Gynaecology Nursing
[2]Narayan Nursing College, Gopal Narayan Singh University, Rohtas, Bihar

Abstract: Falls among older adults are a major public health concern, leading to injuries, reduced independence, and poor quality of life. This study assessed the effectiveness of a structured exercise programme in reducing fall risk among 60 elderly participants in a rural community of Rohtas, Bihar. A quasi-experimental pre-test post-test design was used, and fall risk was measured using the Berg Balance Scale. Findings revealed a significant reduction in fall risk after the intervention, showing that exercise improves balance and reduces the likelihood of falls. It is recommended that exercise-based fall prevention programmes be integrated into rural healthcare services for older adults.

Index Terms **-** Fall risk, Older adults, Exercise programme, Rural community

I. INTRODUCTION:

As people age, their bodies undergo various physiological changes that gradually increase their vulnerability to health risks. One of the most significant yet often underestimated challenges faced by older adults is the risk of falling. Falls are not simply accidents—they are a major public health issue that can lead to severe physical, emotional, and social consequences.

A fall is defined as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level. While falling might seem like a common and harmless event, for older adults it can be life-altering. With increasing age, there is a natural decline in muscle strength, balance, vision, and reaction time. Chronic conditions such as arthritis, diabetes, stroke, or Parkinson's disease, combined with the side effects of certain medications, can further heighten this risk. Environmental factors like poor lighting, slippery floors, uneven surfaces, and lack of handrails or walking aids only compound the problem.

Globally, falls are one of the leading causes of injury and hospitalization among adults aged 65 and above. According to the World Health Organization, approximately 28–35% of people over 65 years fall each year, and this rate increases with age. These falls can lead to fractures**,** head injuries, and even death. Hip fractures are common and often result in long-term disability or institutionalization.

The recovery process is typically slow and complicated, especially when coupled with pre-existing conditions. The impact of falls extends beyond physical injuries. Many older adults who have experienced a fall develop a fear of falling again. This fear can lead to reduced physical activity, social withdrawal, and a loss of independence—all of which can contribute to depression, anxiety, and a further decline in health.

This creates a vicious cycle where the fear of falling leads to inactivity, which then weakens muscles and balance, thereby increasing the risk of future falls. Furthermore, the economic burden associated with fall-related injuries is significant. Hospital admissions, rehabilitation, long-term care, and caregiver support impose a financial strain not only on families but also on healthcare systems.

Preventing falls, therefore, is not just a matter of individual safety—it is a critical component of healthy aging and public health planning. Given the magnitude of this issue, it is essential to investigate the factors contributing to fall risk among older adults and explore strategies for prevention and management.
Fall risk among older adults is a serious concern with far-reaching implications on health, independence, and quality of life. By understanding its causes and consequences, and by implementing targeted preventive measures, we can contribute meaningfully to the well-being of our aging population.

PROBLEM STATEMENT:

A study to assess the effectiveness of exercise programme on fall risk prevention among older adults residing in selected rural community, Rohtas, Bihar.

OBJECTIVES:

1. To assess and compare the pre-test level of fall risk among older adults between the study group and control group.
2. To assess and compare the post-test level of fall risk among older adults between the study group and control group.
3. To determine the effectiveness of exercise program on fall risk prevention among older adults in the study group.
4. To associate the pre-test and post-test level of fall risk among older adults with their socio-demographic variables in the study and control group.

RESEARCH METHODOLOGY:

This chapter deals with the methodology adopted for the current study. Research methodology is a crucial part of any research where meticulous planning on how, where, when, who and what must be done is explained.

RESEARCH DESIGN

A quasi-experimental, non-randomized pre-test post-test design was implemented.

RESEARCH SETTING:

The study was conducted in the selected rural community of Rohtas, Bihar.

SAMPLE TECHNIQUE:

- Sample: Elderly people (aged 60 years and above).
- Sample Size: 60 (determined using Cochran's formula).
- Sampling Technique: Non-random purposive sampling method.

Exclusion Criteria:

- Elderly with neurological conditions like Alzheimer's or dementia.
- Those unwilling to participate.
- Those not present at the time of data collection.
- Elderly with severe immobility

DEVELOPMENT AND DESCRIPTION OF THE TOOL:

The tool was developed after literature review, expert consultation, and prior experience.

- **Part A**: Demographic proforma (age, education, religion, dietary pattern, work pattern, socio-economic status).
- **Part B**: **Berg Balance Scale (BBS)** – a standardized tool (14 tasks) to assess balance and fall risk in older adults.

Scoring (BBS)

- 0–20: High fall risk
- 21–40: Moderate fall risk
- 41–56: Low fall risk

Reliability: r = 0.92 (highly reliable).

Table 1:

Frequency and percentage distribution of the socio-demographic variables of the elderly people in study and control group (N=60)

Variables	Study Group (n=30)	%	Control Group (n=30)	%
Age				
61–70 yrs	4	13.3	6	20
71–80 yrs	9	30	11	36.7
81–90 yrs	11	36.7	5	16.7
Above 90 yrs	6	20	8	26.7
Education				
No formal education	5	16.7	8	26.7
Primary school	6	20	5	16.7
High school	8	26.7	5	16.7
Intermediate	5	16.7	5	16.7
Diploma/Graduate	6	20	7	23.3
Religion				
Hindu	23	76.7	25	83.3
Muslim	5	16.7	4	13.3
Christian	2	6.7	1	3.3
Dietary Pattern				
Vegetarian	18	60	16	53.3
Non-vegetarian	12	40	14	46.7
Socio-Economic				
Upper middle class	10	33.3	9	30
Lower middle class	12	40	17	56.7
Upper lower class	8	26.7	4	13.3

Description:

presents the socio-demographic profile of elderly participants, comparing the study and control groups in terms of age, education, religion, diet, socio-economic status, and lifestyle. Most participants in both groups were aged 71–90 years, belonged to the Hindu religion, and fell under the lower middle-class category.

Table 2:

Assessment of the pretest level of fall risk among the old age in the Study group and in control group:

Group	Low Risk	Medium Risk	High Risk	Mean ± SD	Test Result
Study	0%	43.33% (n=13)	56.67% (n=17)	7.13 ± 1.94	p=0.71 (NS)
Control	0%	46.67% (n=14)	53.33% (n=16)	6.77 ± 1.91	—

Description:

shows the pre-test fall risk levels of elderly participants in both study and control groups. In both groups, none were in the low-risk category; most participants were in the medium and high-risk levels. The statistical test ($p = 0.71$) indicated no significant difference between the two groups at baseline, meaning both groups had a similar fall risk before the intervention.

Table 3:

Comparison of pretest and posttest levels of the fall risk among old age between Study and control group:

Group	Pretest Medium	Pretest High	Posttest Low	Posttest Medium	Posttest High	Mean ± SD	t-test
Study	43.3% (13)	56.7% (17)	86.7% (26)	13.3% (4)	0%	45.87 ± 4.15	t=15.86, p=0.0001 (Highly significant)
Control	46.7% (14)	53.3% (16)	13.3% (4)	36.7% (11)	50% (15)	26.13 ± 5.41	NS

Description:

compares the pre-test and post-test fall risk levels between the study and control groups. In the study group, most participants shifted from medium/high risk to low risk after the exercise program, showing a highly significant improvement ($p = 0.0001$). In contrast, the control group showed only minor changes, with many still in medium or high risk. This indicates that the exercise program was effective in reducing fall risk among the elderly.

Table 4:

Association between the pretest and post-test levels of fall risk and socio-demographic variables in study group:

Variable	Significant Association?	p-value
Age group	Yes	0.017
Education	Yes	0.006
Religion	Yes	0.018
Diet	Yes	0.038
Socio-economic status	Yes	0.028

Description:

shows the association between fall risk (pre-test and post-test) and socio-demographic variables in the study group. The results revealed a significant association of fall risk reduction with age, education, religion, dietary pattern, and socio-economic status ($p < 0.05$), indicating these factors influenced the effectiveness of the exercise program.

Table 5 :

Association between the pretest and post-test level of fall risk and socio-demographic variable in control group:

Variable	Significant Association?	p-value
Age group	No	0.335
Education	No	0.378
Religion	No	0.634
Diet	No	0.538

Variable	Significant Association?	p-value
Socio-economic status	No	0.485

Description:

shows the association between fall risk (pre-test and post-test) and socio-demographic variables in the control group. The results revealed no significant association ($p > 0.05$) with age, education, religion, diet, or socio-economic status, indicating that without the exercise program, these factors did not affect fall risk changes.

DISCUSSION:

This chapter deals with the detailed discussion on the findings of the study interpreted by statistical analysis. The findings are discussed in relation to the objectives, need for the study, related literature, and conceptual framework.

The present study was conducted to evaluate the effectiveness of an exercise program on fall risk prevention among the elderly in selected rural communities in Rohtas. The findings revealed that there was a significant difference in fall risk prevention after administering the exercise program.

Conclusion:

The present study was conducted to evaluate the effectiveness of an exercise programme on fall risk prevention among the elderly in the selected rural communities in Sasaram (Rohtas, Bihar).

The findings of the study revealed that there was a **significant reduction in fall risk** among older adults after administering the structured exercise programme.

- In the **study group**, participants showed a major shift from high and medium fall risk levels to predominantly low risk after the intervention.
- In contrast, the **control group** showed minimal change, with many participants remaining at medium and high risk.
- The results confirm that the exercise programme was **effective in improving balance, strength, and mobility**, thereby reducing fall risk.
- Associations between fall risk reduction and socio-demographic variables (age, education, diet, socio-economic status) were significant in the study group, whereas no such associations were found in the control group.

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