(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue 1 , Page No: 92-98
January-February 2026

IJMSCR

Effect Of Nordic Walking on Balance and Functional Mobility in Geriatric - A Randomised Control Trail.

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Background: There is a physiological and biomechanical evidence suggestion a possible advantage of using poles in walking training programs. The purpose of this proof-of-concept study was to test the hypothesis that un trained elderly, training Nordic walking with Frenkel's for eight weeks show higher improvements on the balance and functional mobility. It was a two – arm random sample and load-controlled study.

Methods: 50 untrained older people were randomly assigned into Nordic walking with Frenkel's (n=25) and free walking(n=25) training group.

Results: statistically analysis of data revealed that both groups had shown improvement in the balance and functional mobility in subjects with geriatrics. But statistically Nordic walking with Frenkel's exercise is more significant than free walking.

Conclusion: This study suggest that our findings indicate that 8 weeks, Nordic walking with Frenkel's exercise is more efficient than free walking in geriatrics

Keywords: Nordic walking, Frenkel's exercise, functional mobility, balance

Introduction

Geriatrics is a branch of medicine concerned with the illness of old age and their care. Geriatrics populations can be categorized into young adult (65-75years), middle old (75-85years) and oldest old (>85 years) (14). According to census 2021, India has 138millions older people, constituting 10.1% of total population (21). BALANCE: It is the condition in which all forces are acting on the body are balanced such a way that the center of mass (COM) is within the stability limits the boundaries of the Base of support (BoS). The prevalence of balance is deficit increases with age and associated with increases incidence of falls seen in elderly population. Balance is the important consideration in the health of elderly subjects it is estimated that 13% of adults Self report imbalance from ages (65-69), its proportion increases to 46% in those aged 85 and older, the estimated annual prevalence of falls is 28%.the main physiology of balance is acted, it means having described about what should be the normal position in balance state, it imbalanced in improper adjustment of COG line. Mobility task requires the individual to move the body from one posture to another in a controlled manner. Functional mobility skills refer to those skills involved in head mobility transfers walking and stair climbing ageing impairs functioning of movements by reducing the number of muscles and nerve fibers, which brings a reduction to muscle strength and power (13). Nordic walking: The Nordic walking is a relatively new modality of walking training that is performed using ergonomically well designated poles. The main purpose of the use of pole is the recruitment of upper limb muscles to produce ground reaction force resulting in an increased energetic expenditure. Therefore, the Nordic walking is considered a physical activity recommended for elderly. Nordic pole

walking and exercise walking are highly recommended low impact exercise to improve fitness and health. While we using Nordic pole walking more than 55% of our muscles are located above the belt line and Nordic pole walking involves all of them. When 90% of all body muscles are engaged more than 600 muscles are working at the same time speeding up metabolism. All upper body muscles become stronger and cardio vascular system is trained 25% more effectively in comparison to walking without pole. Nordic pole walking very popular in Europe and growing fast around the globe helping to fight the epidemic of chronic disease. The physiological effects is easy to understand; regular walking only involves leg muscles and their lower the cardio vascular impact by 25%. The combination of moderate cardiovascular and full body muscle training is a direct result of the impact of poles have on the upper body muscles. Which correlates to improve fat burning, blood sugar burning and the overall metabolic power. While we using NW the increase cardiovascular demand, increase calorie burn up to 46%, reduce neck and shoulder tension and loads on knees and hip joint, improves spinal rotation and posture then activates core muscles. (1,8)

In this study, thus the purpose of the present need is to assess the effect of Nordic walking with Frenkel's exercises and free walking on balance and functional mobility in elderly. This study is to found that Nordic walking is one type of exercise that may be particularly useful to improve function, QoL, balance for elderly.

Materials And Methodology

Materials used: Nordic poles, walking shoes, Chair, measuring, tape cone, stop watch, stepper, first-aid kit

Study design: Randomised experimental study

Study setting: Mallareddy health center

Sample method: chance sampling

Sample size: 60 subjects

Intervention duration: 8 weeks

Inclusion criteria: Age group 65 years and, both male & female, Balance impairment, fall in once in last 12 months, modified tug test taking > 15 sec or support.

Exclusion criteria: Balance disorder causing by conditions, Patients who having other problems along with balance deficit, who could not provide a consent form, modified tug test taking < 15 sec or support.

Study Procedure: A total number of 60 subjects has taken into study. They divided in to 2 groups with 30 subjects in each group. Initially all of them are screened with TUG and FR. Informed consents were taken from all participants. Group-A received Nordic walking with Frenkel's exercises and in group-B, the subjects received free walking. Pre-test and post-test values are noted. The training to the subjects during the study was done by the instructions with oral explanations under supervision.

- Group A – Experimental group: Nordic walking training
- Group B – Control group: Free walking training

Protocol For Nordic Walking with Frenkel's Exercises:

Group – A

The subjects received the Nordic walking poles with comfortable wrist straps are necessary before beginning procedure and the poles should be in suitable height i.e. poles should touch the ground while elbows at 900 and comfortable to walk. Then straighten up and always look ahead, keep your shoulder relaxed and down, hold your poles close to your body and take a step forward with your left foot and at the time, Swing your left arm moves back. Hold on to the handle of the right pole but let go of the left pole – it is secured to your wrist with a strap, so you cannot lose it. When you pole hits the ground, make sure to grad the handle again, tips of your poles should always point diagonally backwards. You should also engage your torso and hips in the movement

The training period is 8 weeks in duration, with 3 weekly sessions (24 sessions in total).

Frenkel's exercises are performed supine, sitting, standing and walking. Each activity is performed slowly with the subjects using vision to carefully guide to correct movement. This exercise required a high degree of mental concentration and efforts. Exercises can be performed with the part supported or unsupported, unilaterally or bilaterally. The subjects can practice as smooth, timed movements. As voluntarily control improves, the exercises progress to stopping and starting commands, increases the range and performing the same exercises with eye closed.

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Group – B

Subjects with control group received the free walking training for 8 weeks. It needs an endurance and speed. Brisk walking for 30 minutes per day, totally 150 – 180 minutes per minute.

The exercises are performed in supine, sitting, standing and walking. Each activity is performed slowly with the patient using vision to carefully guide correct movement. These exercises require a high degree of mental concentration and effort.

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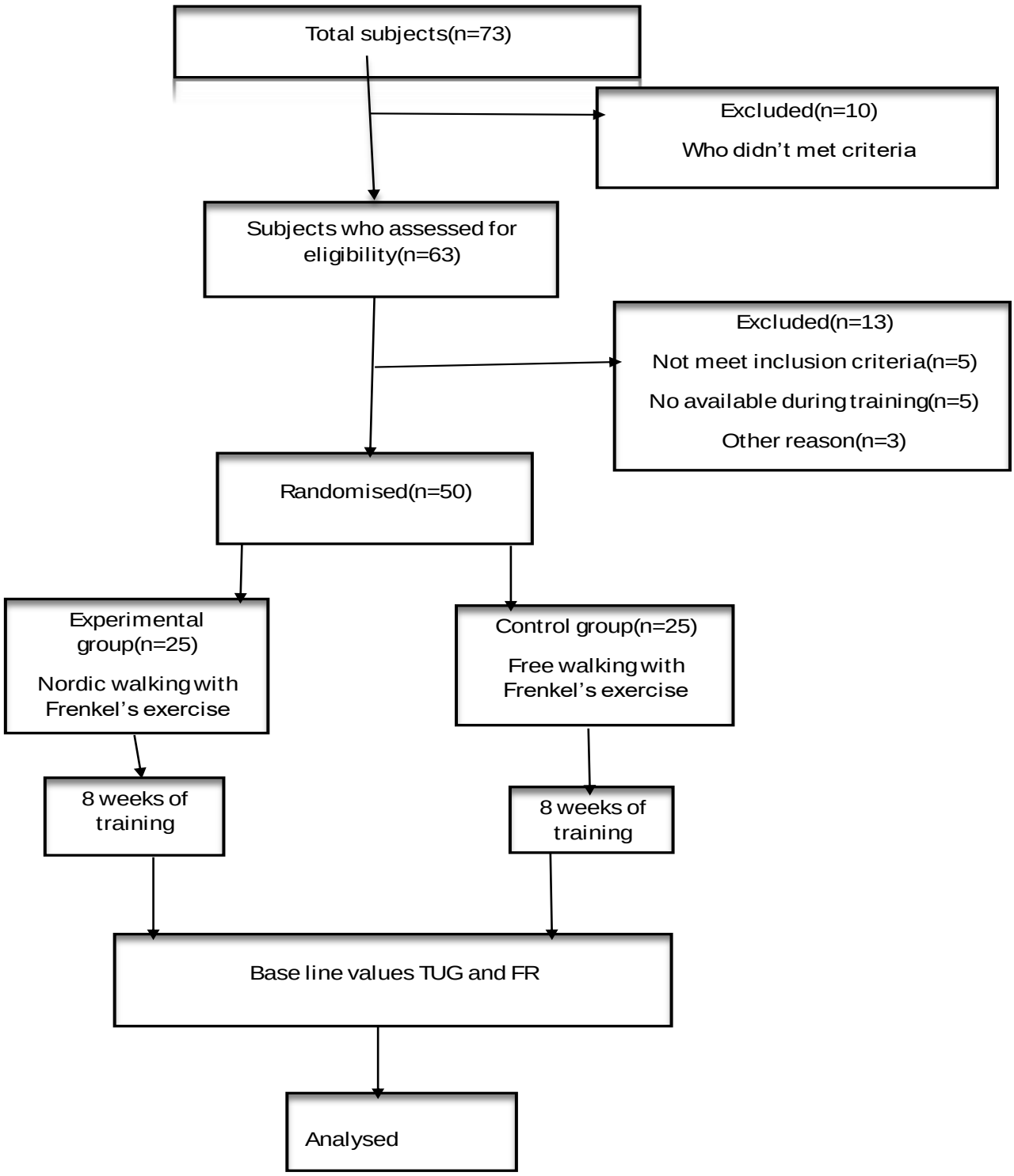

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Data Analysis

Table : Comparison of Mean, Standard Deviation and p-value Between Group A and Group B

Outcome Measure	Test Phase	Group A (Mean ± SD)	Group B (Mean ± SD)	t-value (df = 24)	p-value	Inference
TUG	Pre-test	22.32 ± 1.268	22.72 ± 2.475	0.8464	0.4057	Not Significant
FR	Pre-test	15.88 ± 1.764	15.88 ± 1.691	0.000	>0.9999	Not Significant
TUG	Post-test	13.92 ± 1.187	13.24 ± 0.723	2.471	0.0210	Significant
FR	Post-test	23.56 ± 1.294	22.52 ± 1.610	2.867	0.008	Very Significant

Pre-test comparisons (TUG & FR): No statistically significant difference between Group A and Group B.

Post-test comparisons:

1. TUG: Significant improvement between groups (p = 0.021).
2. FR: Very significant difference between groups (p = 0.008).

Results

The aim of the study is to evaluate the effectiveness of Nordic walkng with frenkel's exercises on balance, functional mobility and free walking in geriatrics.

A total number of subjects were screened and randomized in to 2 groups – 25 each i.e..,Group A were given Nordic walking with frenkel's exercise and Group B were given free walking. Pre and post values of them are noted using TUG and FR scores.

To observe the impact of treatment before and after in the 2 groups, the analysis was carried out using statstical test.

Subjects were at the same baseline of TUG and FR scores before treatment in both groups with a p value <0.0001 after treatment. Patients in groups A have shown more significant improvement in TUG values than Group B with a mean difference of 8.400 in a Group A and in 9.480 Group B.The FR in both groups has shown statistically extremely significant with a p value of <0.0001 after treatment. Subjects in Group A has shown more significant improvement in TUG scores than Group B with a mean difference of in Group A and in Group B.

The post treatment values in both groups is p=0.0210 of TUG values, FR score of p=0.008 consider very significant.

Discussion

In this study, I found significant improvememt this for TUG and FR at post assessment. This study demonstrate the effects of Nordic walking with Frenkel's exercise in geriatric. Taking all together to this study found a clear, functional relevant effect on Nordic walking on balance and functional mobility recovery that is good according with physiological effects in geriatrics findings. In this literature, the number of studies investigate the efficacy of Nordic walking results in improvement in the balance and functional mobility .

In this study 50 subjects impaired with balance and functional mobility were taken, there are no droup outs from the study. In those 50 subjects, 25 were taken control group and 25 were taken for NW. The pre and post values for balance and functional mobility were measured with Timed Up and Go(TUG) and functional mobility than the FW training on Group-B.

The results supported our hypothesis that NW with Frenkel's are results improve balance and functional mobility.

Pellegrini b, et al found that nordic walking are more effective in reducing balance and functional mobility as compared to free walking. Though both groups showed significantly improvement, more

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improvement in group A is because of the pole walking can improvement the muscle activity.

More ever, we confirm that NW promotes gain at cardio-vascular fittness, in upper limbs, muscle strength and functional fittness. These gain are important also in cognitive functions. When NW training is performed. Those outcomes, together with our findings, suggest NW as an adventageous training method for the improvement of the physical condition of healthy elderly people.

These results showed that both training intervention also were effective in improving the static balance of elderly people.

Mohammad Reza Vafaeenasab et al; says that Frenkel's exercises with NW are more benefits with walking equally improve static and dynamic balance in elderly in different settings.

However,In this study significant improvement of balance and functional mobility in the NW with the subjects with geriatrics was performed than free walking.

Conclusion

According to this studies, preliminary findings suggest that Nordic walking can be useful intervention procedure in geriatrics than free walking. It provides a cost-effective treatment for geriatric. Future studies were needed to validate its effectiveness.

Summary

The present study was carried to determine the effects of nordic walking with Frenkel's exercise on balance and functional mobility and free walking on balance and functional

mobility in geriatrics.A total of 50 subjects were taken and were dividedin 2 groups- each group 25 by chance random sampling. The subjects were selected accordingly to the inclusion criteria and methodolgy. Group A received Nordic walking with Frenkel's exercise and Group B received Free walking. These pre intervention and post intervention using TUG and FR values are the outcomes measures of this study.

Both the groups were assessed for TUG and FR scores. These values are statstically analysed within group using paired 't' test and between the groups using un paired 't' test. Statstically analysed of data revealed that Nordic walking with Frenkel's exercise are shown improvement on balance and function mobility in geriatrics.

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