

# Review of Literature on Rhythmic Aerobic Exercises on Balance in Post - Stroke Elderly

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**Abstract:** Background: Stroke is a global public health problem. stroke is second leading cause of death worldwide. Dancing has been utilized as an exercise to improve both functional and metabolic outcomes associated with the aging process, and its concepts have been applied to the elderly population. Music and aerobics are a good combination for development and happiness, when aerobics is done with music then the release of endorphin hormone affects psychological and emotional variables and exercises associated music may increase cognitive stimulation by raising motivation. Aim: The purpose of this study to review the available relevant literature on the effectiveness of rhythmic exercises on balance in post - stroke elderly. Methods: The databases used for searching articles are Pub Med and Google Scholar and the articles are included by the inclusion criteria. Articles are selected between the year 2006 and 2022. Selection Criteria: Selection criteria include post - stroke elderly on balance and articles include rhythmic exercises. Results: Out of 13 articles, 10 articles were included for the review. The results indicate that the effect of rhythmic exercises on balance in post - stroke elderly was predominant. Conclusion: In the literature review analysed that effect of rhythmic exercises on balance for post - stroke elderly. This study concluded that physical activity which included rhythmic exercises reduced the risk of fall and balance issues in post - stroke elderly.

**Keywords:** Rhythmic aerobic exercises, Stroke, Elderly Patients, Rhythmic aerobic exercises, Stroke, Elderly Patients

## 1. Introduction

The core of geriatric practice consists of addressing geriatrics syndrome such as incontinence, psychological issues and falls emphasizing the resultant functional changes that accompany chronic illness, recognizing typical presentation of many diseases and many other problems such as interaction which requires coordination of the work and medical attention.

One of the hallmarks of geriatric medicine is health. The main aim is improving quality of life, restoration of functional capabilities and social participation.

Stroke is a major global public health problem. According to studies done in the year 1990, stroke was the second leading cause of death worldwide. During the past two decades India has been experiencing demographic, economic and epidemiological transition. The results have shown that there is increase in life expectancy and consequently in ageing population.<sup>3</sup> As per WHO, geriatric is classified into 65 - 75 years young old age 75 - 85 years advanced old age where functional losses begin to be observed. 85 years very advanced old age that requires special care and support. Stroke is a cerebrovascular condition in which there is interruption of blood supply or haemorrhage which occurs in the cerebral tissues and it leads to loss of function in brain that is both motor and sensory loss. Cerebrovascular accident is one of the third leading cause of death. Post - stroke patients have impairments, and also will be having deficits loss, cognition and speech, and also various motor dysfunctions that is hemiparesis, muscle strength impairment, motor control is reduced and abnormal reflexes are seen, which will limit activity of daily living and risk of

falls also increases. Gait of patients are characterized by a smaller step and stride length, large base of support, stance phase, which reduces walking speed and abnormal gait patterns are seen and it results in instability and limit mobility. Aim of rehabilitation in patients is to reduce functional dependency and increase in participation in daily living.<sup>5</sup> Dancing has been utilized as an exercise to improve both functional and metabolic outcomes associated with the aging process, and its concepts have been applied to the elderly population. Dance based aerobic exercises have demonstrated improved indices of falling in community dwelling aged. Analysis data indicates that movements with repetitive motions like (forward, backward, and sideways) are essential in reducing fall risk. Music and aerobics are a good combination for development and happiness, when aerobics is done with music then the release of endorphin hormone affects psychological and emotional variables and exercises associated music may increase cognitive stimulation by raising motivation.

### Objective of the study:

To evaluate a Literature review on rhythmic aerobic exercises on balance in post - stroke elderly.

## 2. Methodology

Online search engines used to collect journals were Google Scholar and Pubmed. The author's known articles supported the keywords. The articles were collected in full text. A total of 30 articles were identified, out of which 17 were selected for review.

- Recording identified through database screening
- Manuscripts removed by the replication
- Full - text articles assessed for eligibility

Volume 12 Issue 6, June 2023

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- Articles other than English language.

### Study Selection

#### Inclusion criteria:

- Articles published in English language only
- Articles included with both gender
- Articles published in last 15 years have been taken.

#### Exclusion criteria:

- Articles published in other languages;
- Articles published below the year 2006.
- Articles have not included other than aerobic exercises.

#### Need of the Study

Balance issues are frequently observed in patients with post stroke and related to mobility and an increasing risk of falling in elderly. There is dearth of research on impact of rhythmic and non - rhythmic on exercises and reaction time on balance in post stroke elderly.

So, the purpose of this literature to evaluate effect of rhythmic exercises on functional and symptomatic parameters of moderately disabled elderly people. Hence, need of my study. s

### 3. Review of Literature

- Richard W. Besdine, et al April (2019) conducted a research on the older adults. The research was done on geriatrics and aging and they have concluded that mean age of those more than 65 is now a little more than 75 and it has increase more rapidly more than 85. They concluded that women live about 5 years longer than men, probably because of genetic biologic and environmental factors.
- Meiling Yao et al (2021) conducted research on the high prevalence of Post - stroke anxiety in elderly patients following OVID 19 outbreak. Outcome measure was used to evaluate the anxiety of patients, Hamilton Anxiety Scale (HAMA), the National Institutes of Health Stroke Scale (NIHSS) and the modified Rankin Scale (MRS) was used to evaluate stroke severity and outcome while the Mini - Mental Scale Examination (MMSE) to assess cognitive functions.
- Laurence Z. Rubenstein, et al (2021) conducted research on the relative effectiveness on interventions to prevent falls in older adults on control group. The research was done on the prevention of falls in older adult samples and the treatment given was exercise programmes were included both general and specific physical activity and jaded scale was the outcome measures which was used to evaluate multifactorial falls risk assessment with management programs. They concluded that the interventions to prevent falls in older adults are effective in reducing both the risk of falling and the monthly rate of falling. Exercise programs were effective in reducing the risk of falling. A large proportion of falls and injuries in older people is due to multiple risk factors, many of which probably can be modified or eliminated with targeted fall prevention interventions. These interventions must be feasible, sustainable, and cost - effective to be practical for widespread use. The most promising prevention strategies involve multidimensional fall risk assessment and exercise interventions. Incorporating these intervention strategies whenever feasible into a fall prevention program seems to be the most effective means for fall prevention in older adults.
- Anthony D'Eliso, SPT JaC, et al. (2006) Traditional dance programs have yielded benefits leading to decreased fall risk in older adults, but most require multiple sessions. Results will provide insight into whether a single session rhythmic dance exercise program can be reasonably expected to have a positive effect on reaction time and dynamic balance in community - dwelling older adults.
- Susan Marzolini, et al (2019) research was done on aerobic training and mobilization early post - stroke: cautions and considerations. Objective of this review was to provide guidelines for pre - participation screening, mobilization, and aerobic exercise training in the hyper - acute and post - stroke. They concluded that the early phases post - stroke is a dynamic, volatile time and exercise therapy and mobilization is required. Early interventions may prove beneficial to one parameter of stroke recovery such as cognition.
- Juan Li, et al (2018) The research was done on rehabilitation for balance impairment patients after stroke: a protocol of a systematic review and network meta - analysis. Outcomes used in these study were Berg Balance Scale, the Fugl - Meyer Assessment (balance), the Postural Assessment Scale for Stroke, as well as the function in sitting test, the Sitting Balance Scale, the Ottawa Sitting Scale, the Activities - specific Balance Confidence Scale, the Overall Balance Index and the Brunel Balance Assessment and the Barthel Index, the Functional Ambulation Category Scale, fall rates, the Timed Up and Go test, the MOS 36 - Item Short - Form Health survey. Study concluded that balance is one of the common impairments in post stroke, which is related to worse physical impairments, disability and low quality of life. Balance impairment leads to high fall rates, which brings a great burden to patients who had a stroke, their families and the society and also hampers patient social life.
- Ho Kwon, Jun - Young Song, et al. (2017) This study concluded when rhythmic and non - rhythmic aerobic exercises were done, all participants resulted improvements in depression levels and balance ability and that the rhythmic aerobic exercises were more effective in improving balance ability. According to this study, both exercises resulted in improvement in depression and balance ability of the elderly. Studies concluded that rhythmic aerobic exercise was more effective for dynamic balance.
- B Ordahan A Y Karahan, et al. (2016) Studies suggest that this process is strengthened by specific intensive tasks. During static balance training, visual biofeedback method was used for rehabilitation, as patient visual information on the position of the centre of gravity within the range of stability, as the patients stands on a pressure plate.
- Aseung Ho Shin, et al. (2015) In this study, step length, stride length and single support percentage of the affected side were measured to determine the average

change of spatial gait variables before and after 6 weeks of gait training. In stroke patients is characterized by a decrease in stride length, duration of stance phase of the affected side, single support percentages, and by an increase in duration of the swing phase of the affected side.

#### 4. Discussion

A total 13 studies were included in this review. A number of physical disorders, including movement, cognitive and balance issues are seen in patients with stroke.

Stroke patients experience problems while performing daily activities like climbing stairs, balance, gait and walking. Studies concluded that rhythmic exercises had a positive effect on the improvement of balance.

According to Juan Li. et. al. found a balance impairment is one of the common impairments in patients after stroke, which is related to worse physical impairments, disability and low quality of life and also good balance is a prerequisite for regaining the ability to walk independently and activities of daily living.

Meiling Yao et al. study explored the incidence and predictors of post - stroke anxiety in elderly patients admitted to hospital following the COVID - 19 outbreak and revealed a prevalence of 30.1% for PSA among elderly patients. This study found that the incidence of PSA was higher in females than in males, probably due to the characteristic that female patients are more susceptible to social stress and other psychological factors.

By performing rhythmic exercises, it also stimulates motor neurons in the brainstem and at the spinal level. The cumulative incidence of stroke in India ranged from 105 to 100, 000 persons per year.

Gait is an essential part of a daily activity and allows participation as a member of a community. Weights loaded on both lower limb improved postural symmetry after training, which led to a decreased center of mass sway and improved balance. As there is decreased gait velocity it resulted into major limitation of the community dwelling activity.

Restoring balance is an important in stroke patient once restoration of gait improves. Velocity of gait is related to many motor function factors in stroke patients, especially weakness in the affected lower limb, which is a manifestation of a decreased number of motor units and activation.

The standing posture of stroke patients is characterized by large amplitude, postural sway associated with a lack of a balance and decreased muscle activation can lead to a disproportionate reaction in postural sway and it is effective on improvement in balance as it is affected by elevated levels of muscle activation.

Gait training with additional weight, improves balance ability and gait ability in stroke patients, this gait training

method is effective and suitable for stroke patients to increase the ability of functional independence.

#### 5. Conclusion

The results of this study show that combining aerobics with music can be effective in improving balance and also it helps to strengthen motor skills. This study concluded that physical activity which included rhythmic exercises reduced the risk of fall and balance issues in post - stroke elderly. Dance based aerobic exercises specifically designed for elderly may improve components of balance and locomotion, thereby attenuating risk of falling. Gait training with rhythmic exercises was more effective at improving the balance. Rhythmic exercise has a positive effect on reaction time and dynamic balance in community dwelling older adults.

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