



The physio balance: A review

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Abstract

Background:

- To create awareness among professionals & students and to cognize the importance of the physio balance.
- Balance refers to an individual's ability to maintain their line of gravity within their Base of support (BOS).
- It can also be described as the ability to maintain equilibrium, where equilibrium can be defined as any condition in which all acting forces are cancelled by each other resulting in a stable balanced system.

Methodology:

Data source: Relevant articles were identified by searching from: PubMed, SCIEDIRECT, EBSCO, SCOPUS, Web of Science, shodhganga, Elsevier, Google Scholar.

Data selection: Little significant scientific studies were found relating to the importance of rehabilitation & assessment in sports. Five studies were selected based on inclusion criteria. Two pilot studies included as The Role of assessment in sports.

Results:

- Exalted balance makes daily activities, such as walking on stairs, carrying heavy items, and plop changing directions, easier. A strong, stable base will allow you to move with more coordination, ease, and fluidity. Also gain stronger and more enhanced movement during athletic activities.
- Evolutive good balance helps to improve overall health and fitness levels. These improvements help to prevent the risk of injury and falls, especially in older adults and people with Parkinson's disease. This allows maintaining independence longer.

Conclusions: Physiotherapy interference like balance training combined with muscle strengthening, the range of movement and walking training exercise is effective in improving balance in patients with Parkinson's disease and more effective than balance exercises alone. Highly challenging balance training and incremental speed-dependent treadmill training can also be part of a rehabilitation program for management of balance dysfunction and Postural instability in patients with idiopathic Parkinson's disease.

Keywords: parkinson's disease, physiotherapy, postural instability, balance dysfunction

Introduction

- Balance refers to an individual's ability to preserve their line of gravity within their Base of support (BOS).
- It can also be described as the ability to preserve equilibrium, where equilibrium can be defined as any condition in which all acting forces are cancelled by each other resulting in a stable balanced system.

Definition: "Physiotherapy can detect both static and dynamic balance. Static balance refers to control of your stationary body, while dynamic balance refers to the control you have over your body while it's moving. Deep core stability and hip and leg muscle control are essential for good balance".

(OR) Balance is cognizable and maintained by a complex set of sensorimotor control system that include sensory input from vision (sight), proprioception (touch), and the vestibular system (motion, equilibrium, spatial orientation); integration of that sensory input; and motor output to the eye and body muscle.

{Refrence: Physical Rehabilitation. By-Susan B.O' Sullivan. Thomas J. Schmitz. George D. Fulk(6th Edition)

The following systems provide input regarding the body's equilibrium and thus maintain balance.

1. Somatosensory / Proprioceptive System
2. Vestibular System
3. Visual System

Types of balance

1. Steady state (static) balance

- Maintain stable position in standing or sitting
- This happens when the objects centre of gravity is on the axis of rotation.

2. Reactive balance (Dynamic balance)

- Recovering from an unexpected perturbation.

- Reactive balance is defined as automatic movement patterns, or strategies, that occur when balance is disturbed.
 - They are faster responses than movements under voluntary control. If the response is appropriate no loss of balance will occur.
- 3. Proactive (Anticipatory) balance**
- To develop a device this provides safe controlled, simple, and inexpensive. Reactive balance training for adults.
 - Anticipatory - Body recognize that something is going to happen that will disturb its balance and make the adjustments before it happen.

Vicious cycle



Fig 1

A system model of balance



Fig 2

Abnormal balance

- A. Dynamic balance problem

- B. Difficulty initiating gait
- C. Moments of freezing during movement
- D. Altered gait cycle

Physiotherapy treatment techniques

- Single legs standing
- Alternat single legs standing
- Heel shin test
- Wobble board
- Tandem walk
- Figure of Eight walk

Valid tools to measure balance

- Berg's Balance scale (BBS)
- Romberg test
- Timed up and go test (TUG)
- Functional Reach Test (RT)
- Nudge test
- The Performance-Oriented Mobility Assessment (POMA, Tinetti)
- Other tests: Hallpike-Dix Test

Indication

- Gait and balance difficulties regardless of the underlying neurologic or orthopedic cause
- Medical conditions that can cause mobility difficulties include Parkinson's disease, multiple sclerosis, stroke, neuropathies, and head trauma
- Vestibular disorders that cause dizziness
- Patients with osteoporosis or elderly can benefit from specific balance training to prevent falls and decrease risk of fractures.

Precaution

- High Fall Risk
- Co morbidities
- Recent Surgery
- Injuries

Materials and Method

Study design: Narrative Study/Literature Review

Source of data: PubMed, Sciencedirect, EBSCO, SCOPUS, Web of Science, shodhganga, Google Scholar.

Results and Discussion

- Exalted balance makes daily activities, such as walking on stairs, carrying heavy items, and plop changing directions, easier. A strong, stable base will allow moving with more coordination, ease, and fluidity. Also gain stronger and more enhanced movement during athletic activities.
- Evolutive good balance helps to improve your overall health and fitness levels. These improvements help to prevent the risk of injury and falls, especially in older adults and people with Parkinson's disease. This allows maintaining independence longer.

Conclusion

Physiotherapy interference like balance training combined with muscle strengthening, the range of movement and walking training exercise is effective in improving balance in patients with Parkinson's disease and more effective than balance exercises alone. Highly challenging balance training and incremental speed-dependent treadmill training can also be part of a rehabilitation program for management of balance dysfunction and Postural instability in patients with idiopathic Parkinson's disease.

References

1. Cattaneo D, Jonsdottir J, Zocchi M, Regola A. Effects of balance exercises on people with multiple sclerosis: a pilot study. *Clinical Rehabilitation*,2007;21:771-781. 10.1177/0269215507077602.
2. Paltamaa J, West H, Sarasoja T *et al.* Reliability of physical functioning measures in ambulatory subjects with multiple sclerosis. *Physiother Res Int.* 10.1002/pri.30. [published erratum appears in 2006;2011:2123],2005;10:93-109.
3. Nene A. Physiological cost index of walking in able bodied adolescents and adults. *Clin Rehabil*,1993;7:319-326. 10.1177/026921559300700408.

4. Cattaneo D, Jonsdottir J, Repetti S. Reliability of four scales on balance disorders in persons with multiple sclerosis. *Disability and rehabilitation*,2007;29(4):1920-1925. 10.1080/09638280701191859.
5. Smedal T, Lygren H, Myhr K, Moe-Nilssen R, Gjelsvik B, Gjelsvik O *et al.* Balance and gait improved in patients with MS after physiotherapy based on the Bobath concept. *Physiother Res Int*,2006;11(2):104-116. 10.1002/pri.327.
6. Lord S, Wade D, Halligan P. A comparison of two physiotherapy treatment approaches to improve walking in multiple sclerosis: a pilot randomized study. *Clinical Rehabilitation*,1998;12:447-486.
7. Means KM, Rodell DE, O'Sullivan PS. Balance, Mobility, and Falls Among Community-Dwelling Elderly Persons: Effects of a Rehabilitation Exercise Program. *American Journal of Physical Medicine & Rehabilitation*,2005;84(4):238-250. 10.1097/01.PHM.0000151944.22116.5A.
8. Barnett A, Smith B, Lord SR, Williams M, Baumand A. Community-based group exercise improves balance and reduces falls in at-risk older people: a randomised controlled trial. *Age and Ageing*,2003;32(4):407-414. 10.1093/ageing/32.4.407.
9. Newman M, Dawes H, Berg van den M, Wade D, Burrige J, Izadi H. Can aerobic treadmill training reduce the effort of walking and fatigue in people with multiple sclerosis: a pilot study. *Multiple Sclerosis*,2007;19:113-119. 10.1177/1352458506071
10. <https://www.sciencedirect.com/science/article/abs/pii/S221103482030050X>
11. <https://www.sciencedirect.com/science/article/abs/pii/S0028384315001498>
12. <https://journals.sagepub.com/doi/abs/10.1191/0269215505cr815oa>
13. Suomi R, Kocejka D. Postural sway patterns of normal men and women and men with mental retardation during a two-legged stance test. *Arch Phys Med Rehabil.* Google Scholar | Crossref | Medline | ISI,1994;75:205-209