

# Adapted Dance: A Therapeutic Modality for Neurorehabilitation



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## Agenda

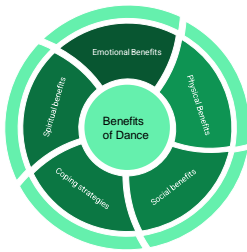
### Learning Objectives:

1. Understand the evidence-based physical, mental, emotional, and social benefits of dance in therapeutic settings
2. Recognize the parallels between dance and sensorimotor training in neurorehabilitation
3. Explore adapted dance techniques that support movement, coordination, and neuroplasticity
4. Engage in interactive activities demonstrating how dance can be integrated into sensorimotor training for rehabilitation



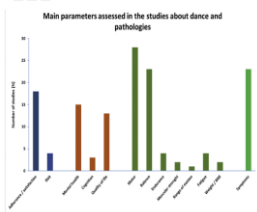
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## Dance: A therapeutic modality



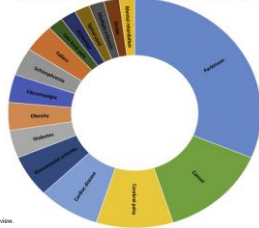
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## Clinical research in dance



Brayner, A. V. (2019). Effects of dance activities on patients with chronic pathologies: scoping review. *Pathogens*, 8(7), e02104.

Distribution of studies about dance program and chronic pathologies



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## Goals of Neurorehabilitation

- Improve motor skills, balance and coordination
- Increase muscle strength, endurance
- Reduce symptoms
- Restore activities of daily living (ADLs)
- Help the patient reach maximum independence
- Improve well-being of patient

## Health Benefits of Dance

- Improved muscular strength, endurance and cardiovascular fitness
- Increased coordination, agility and flexibility
- Better posture and balance
- Improved spatial awareness
- Improved wellbeing, better social skills, self-esteem and confidence

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## Argentine Tango

- Population: Individuals with Parkinson's Disease
- Intervention: 3-week, high volume (450 minutes/week) Adapted Tango intervention
- Pre-Post Changes
  - Peak forward CoM displacement was reduced
  - Improvements on Berg Balance Scale and Dynamic Gait Index
  - Adherence: 77%



Morley, A., Ting, L.H., Hackney, M.E. Balance, Body Motion, and Muscle Activity After High-Volume Short-Term Dance-Based Rehabilitation in Persons With Parkinson Disease: A Pilot Study. *J Neurol Phys Ther*. 2019 Oct;43(4):207-68. doi: 10.1089/NPT.0000000000000110. PMID: 27576992; PMCID: PMC6526380.

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## Agilando

- Population: Healthy elderly adults (range, 60-94 years)
- Intervention: A special dance program developed for elderly people (called Agilando) in a dance school, for 24 weeks.
- Pre-Post Changes
  - Significantly shorter reaction times
  - Improved performance in hand-arm steadiness, control precision, and wrist movements
  - Enhanced tactile and haptic performance
  - Improved general well-being



Katzenoth, J. C., Kiliach, T., Hill, S., Tegenhoff, M., & Dine, H. R. (2013). Six months of dance intervention enhances postural, sensorimotor, and cognitive performance in elderly without affecting cardio-respiratory functions. *Frontiers in aging neuroscience*, 5, 5.

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## Turkish Folklore dance

- Population: Healthy elderly adults Over age 65
- Intervention: Adapted Turkish dance for 8 weeks, 1 hour each, 3 times a week
- Pre-Post Changes
  - Improvements in 6 min-walk, chair rise, stair climbing, Berg Balance scale
  - Increased muscle force and endurance



Eyigor, S., Kocapinar, H., Dumaz, B., Kiboglu, U., & Cakar, S. (2009). A randomized controlled trial of Turkish folklore dance on the physical performance, balance, depression and quality of life in older women. *Archives of gerontology and geriatrics*, 48(1), 84-86.

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## Creative Dance

- Population: 37 participants over age 55-80
- Intervention: 3 days a week over 12 weeks, each session approximately 90 minutes
- Pre-Post Changes
  - Better arm-positioning
  - Better knee JPS, knee kinesthesia in flexion and extension
  - Improved proprioception



Marmeleira, J. F., Pereira, C. L. N., Cruz-Ferreira, A., Freitas, V., Pires, R., & Fernandes, O. M. (2009). Creative dance can enhance proprioception in older adults. *Journal of sports medicine and physical fitness*, 49(4), 480-485.

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## Adapted Indian Dance



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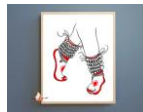
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## Indian Classical Dance

- Nritta, Nritya, Natya
- Progressively increasing complexity
  - Foot patterns at three different speeds
  - Coordinated hand-leg movements
  - Increasing mobility
- Gross and fine motor skills
- Rhythmic weight shifting
- Rhythmic patterns
- Structured total body movements
- Multisensory integration
- Depict emotions
- Accessible to all



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## Adapted Choreography for Sensorimotor Control

### Current training

- Perform tasks of increasing motor complexity with changing base of support
- Dual-tasking
- Visual tracking by turning head
- Head shaking to engage the vestibular system
- Rhythmic entrainment for dynamic stability

### Dance Movements

- Coordinated lower and upper extremity movements
- While doing these movements, look at your hands, follow them by turning your head
- Change rhythm patterns, add complexity

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Warm Up

Warm up music

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14

Music

Chatushra Slow



Rupaka



Chatushra Fast



Matya



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15

### What a wonderful world

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#### Verse 1

I see trees of green, red roses too  
I see them bloom for me and for you  
And I think to myself  
What a wonderful world

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### What a wonderful world

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#### Verse 2

I see skies of blue and clouds of white  
The bright blessed days, dark sacred nights  
And I think to myself  
What a wonderful world

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### What a wonderful world

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#### Verse 3

The colors of the rainbow, so pretty in the sky  
Are also on the faces of people going by  
I see friends shaking hands, saying, "How do you do?"  
They're really sayin', "I love you"  
I hear babies cry, I watch them grow  
They'll learn much more than I'll never know

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### What a wonderful world

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Verse 4

And I think to myself  
 What a wonderful world  
 Yes, I think to myself  
 What a wonderful world

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### Thank you

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