Effect of Dance Therapy on Balance, Quality of Life And Depression Status in Patients With Parkinson’s Disease

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ABSTRACT

Introduction: Parkinson’s disease (PD) is the second most common neurodegenerative disorder, characterised by the cardinal features of rigidity, tremors, bradykinesia & postural instability. Balance disturbances, poor quality of life and depression are common in Parkinson’s disease. Habitus social dancing over several years is associated with superior balance, gait function and leg reaction times compared to age-matched non-dancers. Older adults who danced were more motivated to pursue healthy, exercise-related behaviors and demonstrated improved balance and functional mobility. Dance is an excellent example of an activity that provides these requirements and is considered enjoyable, motivating and engaging. In addition, quality of life improved significantly among individuals with PD who participated in tango, whereas those who participated in Waltz/ Foxtrot or Tai Chi had no change.

Method: 15 patients were selected by convenient sampling. Intervention was given for balance, quality of life and depression status by using dance therapy twice a week for 4 weeks. Pre and Post assessment was done before starting of 1st session and at the end of 8th session by using BBS, PDQ39 and BDI. Statistical analysis was done by using Wilcoxon signed rank test.

Result: Significant improvement in pre and post scores of BBS (p=0.001) and PDQ39 (p=0.001) were observed statistically. BDI scores (p=0.317) were not statistically significant.

Conclusion: This study concludes that Dance Therapy has shown significant improvement in Balance and Quality of Life of the patients. So this study accepts the hypothesis that Dance Therapy is effective in improving Balance and quality of life in Parkinson’s patients.

Key Words: Parkinson’s disease, Balance, Quality of life, Dance Therapy.

INTRODUCTION:

Parkinson’s disease (PD) is the second most common neurodegenerative disorder, after Alzheimer’s disease. PD affects 1% of the population over 60 years of age, and the risk increases proportionally with age. It is a
chronic progressive disease of the nervous system characterised by the cardinal features of rigidity, tremors, bradykinesia & postural instability\textsuperscript{1,2}. The first published description is contained in an essay on the shaking palsy published in 1817 by James Parkinson\textsuperscript{3} as a condition in which the sufferers exhibited “involuntary tremulous motion with lessened muscular power in parts not in action & even when supported with a propensity to bend the trunk forward & to pass from a walking to a running place the senses & intellects being uninjured.”

Balance is a complex process and every activity we carry out requires us to react to gravity & our body to adjust accordingly in order to maintain balance.

Rehabilitative programs for postural instability are most effective if they incorporate dynamic balance practice and continual adjustment to environmental demands\textsuperscript{4,5} Dance is an excellent example of an activity that provides these requirements. Considered enjoyable, motivating and engaging\textsuperscript{6,7,8} dance may be an excellent way to address motor impairments associated with PD as it likely fosters interest in continued participation. Habitual social dancing over several years is associated with superior balance compared to age-matched non-dancers\textsuperscript{9,10}. Older adults who danced were more motivated to pursue healthy, exercise-related behaviors and demonstrated improved balance and functional mobility\textsuperscript{11,12} Greater balance in elders that participated in tango lessons were noted when compared to a walking group\textsuperscript{13}. For individuals with PD, balance improvements after an Argentine tango program exceeded those of traditional exercise after a long duration, moderate dosage program\textsuperscript{14,15} Improvements in balance were also demonstrated after a short duration, high dosage tango program\textsuperscript{16}. In addition, quality of life improved significantly among individuals with PD who participated in tango\textsuperscript{17}, whereas those who participated in Waltz/ Foxtrot or Tai Chi had no change\textsuperscript{17} All studies to date have examined the effects of dance on individuals with PD. This study aimed to determine the effectiveness of group dance class for an individual with PD, by pharmacological agents, thus non-pharmacological approaches are necessary\textsuperscript{18}

**METHOD:**

Patients diagnosed with Parkinson’s disease and willing to join the study were selected by convenient sampling. Screening was done for them by using MMSE & Hoeh Yahr scale. Totally 15 patients were selected for the study who fulfilled the criteria for inclusion.

Written consent was taken from all the patients and they were explained about the procedure and the instructions. BBS, PDQ-39 score and Becks depression Inventory were taken as an outcome measure before starting the first session as a part of pre assessment.

Class started with standing warm-ups to classical instrumental music. Warm-up consisted of breathing exercises, ROM exercises of limbs using dance movements. After that the class listened and dance to classical instrumental music with beats. Novel Bharatanatyam –Nritta (technical aspect) step elements were introduced and participants practiced the new steps repetitively in continuation. The participants travel around the dance floor by walking in various rhythms in synchrony.

Steps that the class practiced included:

- Feet taps called Adavus which are basic hand-foot coordination techniques.
- Multi-directional steps combining the adavus.
- Rocking weight-shifts, leg lifts, and decorative embellishment Bharatanatyam-style steps, which often involved single leg support for a few seconds

Later on hand movements will be slowly added to these previously learnt foot adavus.

Thus steps involving the hands and legs together will be practiced creating Nritya (Dramatic element)

The class will end with different facial movements done in front of the mirror and reciting 1 shloka at the end.
This training was given for 2 days a week for 4 weeks. After completion of last session post assessment scores were taken on the basis of outcome measures.

**DATA ANALYSIS AND INTERPRETATION:**

For pre-post comparison for values of BBS score, PDQ39 and BDI at the end of intervention, Wilcoxon Signed Rank Test was used

**Statistics:**

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>BBS_pre</th>
<th>BBS_post</th>
<th>BDI_pre</th>
<th>BDI_post</th>
<th>PDQ_pre</th>
<th>PDQ_post</th>
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<tbody>
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<td>N</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Mean</td>
<td>36.4667</td>
<td>38.93</td>
<td>6.47</td>
<td>6.33</td>
<td>425.85</td>
<td>343.64</td>
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<td>Median</td>
<td>39.0000</td>
<td>41.00</td>
<td>6.00</td>
<td>6.00</td>
<td>422.85</td>
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<td>Std. Deviation</td>
<td>6.10464</td>
<td>6.756</td>
<td>3.091</td>
<td>3.177</td>
<td>77.952</td>
<td>72.866</td>
</tr>
</tbody>
</table>

**Graph 1.**

**Graph 2.**

**Graph 3.**
RESULT:
In this study, 15 Parkinson’s patients were included based on the inclusion criteria. Patients were treated by using dance therapy. Outcome measures were BBS, PDQ39 and BDI.
Data analysed by using the SPSS Professional statistics, Version 21 software for windows. Wilcoxon Signed Rank test was used to compare pre and post intervention scores.
By applying Wilcoxon Signed Rank test for BBS scores
The mean value for BBS pre training was 36.46 which showed significant increment indicating improvement in post treatment mean value of BBS 38.93 as shown in table.
Significant increment in BBS score was observed after training which was p=0.001 indicating effectiveness of dance therapy.
By applying Wilcoxon Signed Rank test for Quality of Life measurement
The mean value for PDQ pre training was 425.85 which showed significant reduction indicating improvement in post treatment mean value of PDQ 343.64 as shown in table.
Significant reduction in PDQ39 score was observed after training which was p=0.001 indicating effectiveness of dance therapy.
By applying Wilcoxon Signed Rank test for Depression status
The mean value for BDI pre training was 6.47 which showed insignificant improvement in post treatment mean value of BDI 6.33 as shown in table.
Insignificant improvement in BDI score was observed after training which was p=0.317 indicating effectiveness of dance therapy.

DISCUSSION:
There are only few supporting evidences of Dance Therapy as an adjunct therapy with physical therapy. there is a need to evaluate effects of active dance therapy as an adjunct therapy on motor performance in parkinsons’s disease (PD) patients. With exciting advances in basic science research suggesting neurochemical and neuroplastic changes after exercise, an increasing number of high-quality studies are documenting particular aspects of mobility improving after exercise. Exercise has the potential to help both motor (gait, balance, strength) and non motor (depression, apathy, fatigue, constipation) aspects of Parkinson's disease as well as secondary complications of immobility (cardiovascular, osteoporosis).There are recent evidence on the effects of exercise in improving mobility while highlighting the importance of targeted exercise intervention for maximizing the benefits of exercise.19
In this study we evaluated the balance, quality of life and depression status of Parkinson’s patient’s pre and post intervention. After 4 weeks of 40 minutes group dance lessons twice per week, a participant with H&Y stage 3 and 4 PD improved in measures of balance and quality of life significantly. This is the first study to demonstrate the potential benefits of Indian Classical dance for an individual with PD.
In previous work on tango in PD, they noticed an average change of 8 % on the Berg Balance scale and 4% on the PDQ 39-SI from pre to post 16 whereas in another study a 131% change on the Berg and a 14% change on the PDQ 39 summary index was noted. The participants in this study experienced a __% change on the Berg and a __% change on the PDQ-39 summary index.
Madeleine E. Hackney et al. studied the effects of partnered Tango dance on patients with severe PD. He evaluated the endurance, balance and quality of life of the patients pre and post dance sessions. After completion of 20 dance sessions of 2 sessions per week of 1 hour each, it was observed that the participant improved on the Berg balance scale, 6 minute walk test, and functional Reach test. They reported increased balance confidence and improved quality of life as measured by the Parkinson Disease Questionnaire-39 summary index. Gains were maintained at the one-month follow-up. Thus twenty partnered tango lessons improved balance, endurance, balance confidence, and quality of life in a participant with severe PD. This is
the first report of the use of Tango dance as rehabilitation for an individual with advanced disease who primarily used a wheelchair for transportation. Composed of dynamic steps, Bharatanatyam involves frequent movement initiation and cessation, a range of speeds, rhythmic variation and spontaneous multi-directional perturbations. Participants must focus on step placement, trunk control and stepping strategies, whole body coordination, somatosensory awareness, attention, path of movement and aesthetic qualities of movement. There are also auditory and visual cues provided in Bharatanatyam that may facilitate movement, and prior research has supported the helpful effects of visual and auditory cues for enhancing mobility in individuals with PD. All these characteristics may target PD-related movement impairments, such as bradykinesia and postural instability, and possibly others that were not measured in this study, i.e., multi-tasking, and stride length regulation. More research is necessary to examine the effects of such a dance program on the activities of daily living in individuals with PD. The improvement in quality of life, as noted on the PDQ-39, could be especially important to an individual in late stages of PD. Psychological adjustment to the effects of Parkinson disease had a greater effect than disease severity on several aspects of quality of life. Relationship-related goals with partner and family appear to be of utmost importance to those with PD and activities that foster achievable life goals and prevention of life goal derailment are imperative for their mood function and quality of life. Previous work has shown that tango improves quality of life not just through gains in mobility but also through enhanced social support. This study was done on 15 patients with diagnosed Parkinson’s disease. Dance training was given by using structured instructions by an instructor on classical music with beats playing in the background for 2 days in a week for 4 weeks. The present result shows significant improvement in balance and quality of life statistically and clinically. Along with it clinical improvement in depression status was also noticed. So in conclusion we can say Dance therapy using Bharatanatyam Indian classical form is able to improve the balance and quality of life in patients with Parkinson’s disease.

**CONCLUSION:**
This study concludes that Dance Therapy has shown significant improvement in Balance and Quality of Life; Although Depression score post intervention showed insignificant improvement. So this study accepts the hypothesis that Dance Therapy is effective in improving balance and quality of life in patients with Parkinson’s disease.

**REFERENCES:**