INTRODUCTION

Parkinson’s disease (PD) is a neurodegenerative disorder characterized by motor symptoms such as bradykinesia, tremors, stiffness, and postural disturbances. In addition to these motor symptoms, PD is also associated with various non-physical symptoms such as pain, fatigue, hyposmia, sleep disturbances, depression, and cognitive impairments. The pathology of PD primarily involves the basal ganglia and the presence of Lewy bodies, which are protein clusters containing alpha-synuclein. The exact etiology of PD is still unknown, and current therapies have limited effectiveness in modifying the progression of the disease [1].

Balance is an essential aspect of physical functioning that involves the integration of sensory information and the coordination of movements to maintain stability. Individuals with PD often experience balance impairments, which can significantly impact their quality of life and increase the risk of falls. Balance problems in PD are characterized by reduced stability, decreased stride length and height, slow gait speed, altered body rotation, and impaired arm swing [2].

One potential contributing factor to balance impairments in PD is the instability of gaze control. Gaze stability refers to the ability to maintain a stable gaze on a target while the head is moving. It is an important aspect of postural control and plays a crucial role in maintaining balance during locomotion. Dysfunction in gaze stability can disrupt the integration of visual and vestibular information, leading to postural instability and increased fall risk [3].

The objective of this manuscript is to evaluate the impact of incorporating gaze stability exercises in balance training programs for individuals with Parkinson’s disease. Specifically, we aim to assess the effects of balance training programs with and without gaze stability exercises on balance performance, postural control, and fall risk in participants with PD. To achieve this objective, we conducted a randomized controlled trial (RCT) in which individuals with PD were randomly assigned to two groups: one group receiving balance training with gaze stability exercises and the other group receiving balance training without gaze stability exercises [4].

By comparing the outcomes between the two groups, we aim to determine the specific impact of incorporating gaze stability exercises in balance training for individuals with Parkinson’s disease. The findings of this study have the potential to inform and enhance the development of targeted interventions that can improve balance and reduce fall risk in individuals with PD [5].

MATERIALS AND METHODS

Data source: Pacific Medical College and Hospital, Bedra, Udaipur

Methods of data collection

Population: Participants diagnosed with PD.

Study design-randomization

Sample size-60 subjects, 30 in each group. Study duration was 08 w.

Inclusion criteria

• Both male and female.
• Elderly population above 60 y
• Subject willing to participate and medically stable.
• Mild and moderate stage of Parkinsonism disease

Exclusive criteria

• Neurological disorder like stroke, peripheral neuropathy, traumatic brain injury.
• Auditory impairment
• Lower and upper limb amputation

ABSTRACT

Objective: Parkinson’s disease (PD) is a neurodegenerative disorder characterized by motor symptoms and various non-physical symptoms. Balance impairments are common in individuals with PD and can increase the risk of falls. Gaze stability, the ability to maintain a stable gaze while the head is moving, is an important aspect of postural control and can contribute to balance impairments in PD.

Methods: The study conducted a randomized controlled trial (RCT) with individuals diagnosed with PD. Two groups were formed: one receiving balance training with gaze stability exercises and the other receiving balance training without gaze stability exercises. Measurements were taken before and after the two-month intervention period.

Results: The gender distribution showed that there were 12 men and 18 women in Group A, and 17 men and 13 women in Group B. Within both groups, there were significant improvements in self-care, range of motion, postural instability, and falling values after the intervention.

Conclusion: Incorporating gaze stability exercises in balance training programs for individuals with PD can improve fall frequency, mobility, self-care skills, and balance. Gaze stability exercises are effective in addressing postural instability and enhancing balance and gait abilities. These findings suggest the potential benefits of incorporating gaze stability exercises in interventions to reduce fall risk and improve the quality of life for individuals with PD.

Keywords: Parkinson’s disease, Balance training, Gaze stability exercises

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- Advanced stage of Parkinson disease

**Material used**

- Hard armless chair
- Stopwatch or wristwatch
- Walkway
- Wall
- Bed
- Stability trainer
- Pen and paper

**Methodology**

In this study, informed consent was obtained from individuals with Parkinson’s disease (PD). The organizations included in the study were randomly selected based on certain criteria. The intervention involved discussions and goal formulation within each organization. The intervention was conducted for six days a week over a period of two months. Measurements were taken before and after the intervention. Group A focused on static and dynamic balance exercises with progression and challenges, while Group B focused on gaze organization and stability exercises. Group A performed activities to improve static stability, such as sitting, kneeling, and standing postures, as well as various exercises to gradually increase independence. Progression included performing activities on softer surfaces and narrowing the base of support while incorporating visual cues. The institutional ethics committee has reviewed protocol no. IEC/232/2022 to conduct the above study. The protocol was approved by the member of IEC held on 29/08/2022.

**RESULTS**

The table above shows that the study was conducted with 30 patients in each group, in group A 12 men and 18 women; There are 17 male and 13 female subjects in group B. In the between-subject differences study, p<0.001

<table>
<thead>
<tr>
<th>Table 1: Gender distribution</th>
<th>Group A</th>
<th>Percentage</th>
<th>Group B</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>40</td>
<td>17</td>
<td>5.66</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>60</td>
<td>13</td>
<td>43.33</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100%</td>
<td>30</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table above shows that the study was conducted with 30 patients in each group, in group A 12 men and 18 women; There are 17 male and 13 female subjects in group B. In the between-subject differences study p<0.001

When evaluated before and after the intervention, there were significant improvement results in self-care, range of motion, postural instability and falling values in groups A and B, p<0.000.
DISCUSSION

The objective of this manuscript was to evaluate the impact of incorporating gaze stability exercises in balance training programs for individuals with Parkinson’s disease. The study utilized a randomized controlled trial (RCT) design to compare the effects of balance training programs with and without gaze stability exercises on balance performance, postural control, and fall risk in participants with Parkinson’s disease [6].

The results of the study demonstrated significant improvements in balance performance and postural control measures at 6 mo for the group that received balance training with gaze stability exercises. The Modified Falls Efficacy Scale (MFES) and the Time Up and Go (TUG) test showed statistically significant differences between the control and experimental groups. The MFES measures the level of perceived disability and fear of falling during social and physical activities, while the TUG test assesses an individual’s mobility [7].

The findings suggest that incorporating gaze stability exercises in balance training can reduce the risk of falls and effectively improve balance, perceived disability, and fall prevention in individuals with Parkinson’s disease. The relationship between postural control and visual reference for postural control was supported by the literature on Parkinson’s disease and fall prevention [8].

However, the study had certain limitations. The sample size was small, and the number of treatment sessions was limited. Advanced stages of Parkinson’s disease were excluded from the study due to the unavailability of the sample. The lack of long-term follow-up limits the understanding of the intervention’s sustained effects [9]. Further research is recommended to explore the effects of stability activities and gaze stability exercises in individuals with Parkinson’s disease. Future studies with larger sample sizes would enhance the validity of the results. Long-term follow-up studies should be conducted to assess the overall improvement in stability and fall prevention and to evaluate the long-term impact of physiotherapy services [10].

Additional research can also investigate the impact of physiotherapy services in different subgroups of Parkinson’s disease, such as advanced stages. Considering the covariate of exercise effect, future studies should examine the type and frequency of physical activities performed on a daily basis. In summary, the study population consisted of 60 participants with Parkinson’s disease, with 30 subjects assigned to the balance exercise group and another 30 subjects assigned to the gaze stability with stability exercise group [11].

The mean age of the participants was 67 y. The treatment approach in this study was based on the Modified Falls Efficacy Scale and the Time Up and Go test, which showed that individuals with Parkinson’s disease benefited from a goal-directed training approach for fall prevention and mobility. The efficacy of the treatment was evident in the participants’ social and daily environments [12].

Overall, this manuscript provides valuable insights into the potential benefits of incorporating gaze stability exercises in balance training programs for individuals with Parkinson’s disease, highlighting the importance of addressing postural control and visual reference in improving balance and reducing fall risk [13].

CONCLUSION

In conclusion, this study demonstrates that incorporating gaze stability exercises in balance training programs for individuals with Parkinson’s disease leads to improvements in fall frequency, mobility, self-care skills, and balance. The results indicate that gaze stability exercises are effective in addressing postural instability and enhancing balance and gait abilities. The findings highlight the potential of incorporating gaze stability exercises in balance training interventions to improve the quality of life and reduce fall risk in individuals with Parkinson’s disease.

FUNDING

Nil

AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICT OF INETRESTS

Declared none

REFERENCES