



## **A comparative study to assess the effectiveness of gaze stability versus Brandt Daroff exercises on quality of life in patient with benign paroxysmal positional vertigo in ENT department of government medical college and hospital Dehradun Uttarakhand**

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### **Abstract**

Benign paroxysmal positional vertigo (BPPV) is a prevalent cause of vertigo, affecting 30% of people at least once in their lifetime. Physical exercise has been shown to be an effective treatment for BPPV. This study aimed to compare the effects of gaze stability exercises versus Brandt-Daroff exercises on the quality of life in BPPV patients at Government Dun Medical College and Hospital, Uttarakhand, India. An experimental pre-test post-test design was used, with 20 BPPV patients in each group selected through purposive sampling. The Dizziness Handicap Inventory (DHI) tool was utilized for assessment. Results indicated that the mean DHI score in Group 1 (gaze stability) was 35, while in Group 2 (Brandt-Daroff) it was 25.75. The study concluded that gaze stability exercises are more effective than Brandt-Daroff exercises in improving the quality of life for BPPV patients.

**Keywords:** Gaze stability, Brandt Daroff exercise, quality of life benign paroxysmal positional vertigo

### **Introduction**

**Research study on BPPV prevalence:** Global research trends in BPPV: A bibliometric analysis shown that BPPV prevalence pronounced peak in 2021 due to COVID - 19 noted increases in outpatient consultations around 183% in 2020 [1].

Study also found; half of patients admitted to the hospital for falls has positive dix-hall pike test. Due to lack of awareness of the disease, diagnosis is delayed. Study have also shown that BPPV patients has also suffer from anxiety, insomnia, social dysfunction & even severe depression with female patients especially showing more severe psychiatric abnormalities.

changing in position [2]. Figure 1 shows structure of semicircular canal which is about three; Anterior, Posterior and Lateral situated in plane responsible for equilibrium.

Benign paroxysmal positional vertigo (BPPV) is the most common vestibular disease which mainly manifested by vertigo. BPPV includes 25% of all type of vertigo and 60% of peripheral vertigo. BPPV patients has dizziness, nausea, imbalance, vertigo and impaired standing & walking while BPPV leads to fatal injury caused by falls. It affects overall health including physical activities social participation and

emotional wellbeing also. Because of demand of the study and its impact on overall health, Student researcher felt the need to conduct the study for the patients benefits by focusing on enhancing life quality by preventing risk of fall, physical disability and inactivity with enhancement of lifestyle. Vestibular system is a sensory system includes the parts of inner ear help in controlling body balance and eye movement. It is responsible for providing information to brain about motion, head position & posture [3].

Gaze stability is the ability of the eyes to fixate on a stable point when the head is moving in space. GSE facilitate compensation and to help restore body's natural ability to hold an image clear and stable when head moves. Through practising specific eye and head movements that activate and challenge VOR by strengthening brain and eye muscles and the communication pathways that connect them [4-6].

Brandt-daroff exercises are a series of simple movement originally designed to habituate the CNS to the provoking position. Exercise includes sitting, supine with head rotation to 45 degree in left, right and repeating the steps. This also act to dislodge debris from the cupula or by causing debris to move out of the canal [7-10].

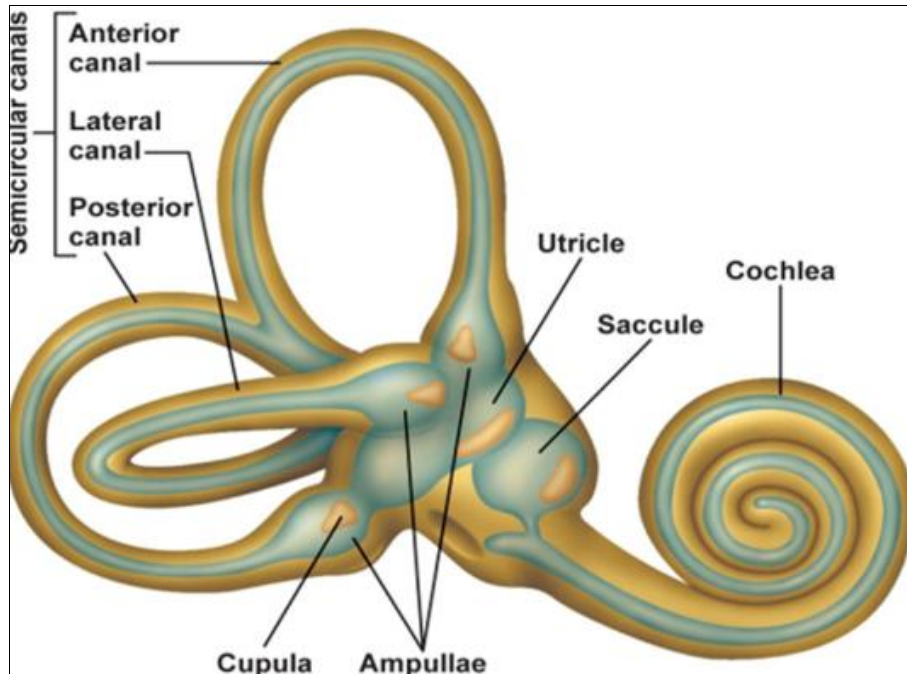


Figure 1 Semicircular Canal

**Materials and Methods**

Quantitative Approach with experimental group pre - test and post - test Research design was used in the study. A purposive sampling technique was used to collect data from 40 benign paroxysmal positional vertigo patients, based on the inclusive criteria 20 samples in experimental group I and 20 samples in experimental group II was selected [11]. The study was conducted in Government Doon Medical College and Hospital Dehradun Uttarakhand. On the first day demographic variables data in both groups were collected using a structured interview method. A pretest was then conducted on the participants using the

structured dizziness handicap inventory questionnaires check list to assess level of quality of life [12-13]. Patients in experimental group I were given gaze stability exercise and in experimental group II were given brandt daroff exercises (6 days weekly) every day for 15 minutes. 28 days after the exercise post - test was performed using the same DHI tool [14-15]. Data analysis was done by using SPSS version 25 and used both descriptive (mean, percentage, standard deviation) and inferential statistics. Figure 2 details about the methodology percentage, standard deviation) and inferential statistics. Figure 2 details about the methodology flow used for carrying out the entire study.

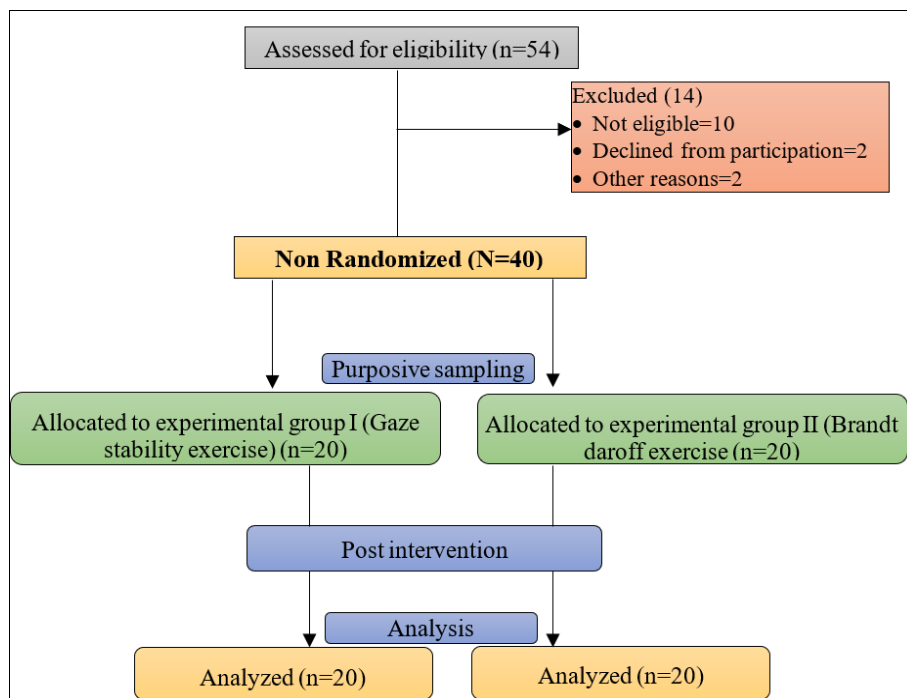


Fig 2: Methodology flowchart

**Tool**

**Section A: deals with socio-demographic variables**

It includes Age, gender, educational status, residence area and occupation of benign paroxysmal positional vertigo patients.

**Section B: Deals with Structured Dizziness Handicap Inventory Questionnaire**

It contains 25 questionnaires, to each item the following scores can be assigned:

No = 0 Sometimes = 2 Yes = 4 (Total score =100)

16 - 34 points (mild handicap)

36 -52 points (moderate handicap)

54 + points (severe handicap)

**Statistical Analysis**

Frequency and percentage distribution were used to analyses the demographic variables and the mean and standard deviation were calculated. Independent ‘t’ test was used for comparison of pre - test and post - test values between two experimental group.

**Ethical Consideration**

Administrative permission was obtained from the principal and ethical committee of the State College of Nursing, 107, Chander Nagar, Dehradun, Uttarakhand. To conduct the research study, Written permission was obtained from Principal, Government Doon Medical College, Dehradun. Written informed consent was obtained from the participants for the study.

**Results and Discussion**

Table 1 shows the frequency and percentage distribution of Dizziness Handicap Inventory (DHI) scores for the experimental group (GSE) before and after the intervention. In the pre-test, 45% of participants had a mild handicap, 35% had a moderate handicap, and 20% had a severe handicap. Post-test results indicate that the percentage of participants with a mild handicap remained the same at 45%, while those with a moderate handicap increased to 50%, and those with a severe handicap decreased significantly to 5%. This suggests that the gaze stability exercises were effective in reducing the severity of dizziness-related handicaps, as evidenced by the shift from severe to moderate handicaps and the statistically significant improvement at the  $p < 0.05$  level.

**Table 1:** Frequency and percentage distribution of subject pre-test and post-test DHI score in gaze stability group

DHI Score	Experimental Group I (GSE)			
	Pre-test		Post test	
	f	%	f	%
Mild handicap	9	45	9	45
Moderate handicap	7	35	10	50
Severe handicap	4	20	1	5
Significant at level of $p < 0.05$				

Table 2 presents the frequency and percentage distribution of Dizziness Handicap Inventory (DHI) scores among subjects in the Brandt-Daroff exercise group, comparing pre-test and post-test results. In the pre-test, 50% of the subjects experienced a mild handicap, 40% had a moderate

handicap, and 10% had a severe handicap. Post-test results showed significant improvement, with 85% of subjects reporting a mild handicap, 5% a moderate handicap, and 5% a severe handicap. This indicates that the Brandt-Daroff exercises were effective in reducing the severity of dizziness-related handicaps among the subjects.

**Table 2:** Frequency and percentage distribution of subject pre-test and post-test DHI score in brandt daroff exercise group

DHI Score	Experimental Group II (BDE)			
	Pre-test		Post test	
	f	%	f	%
Mild handicap	10	50	17	85
Moderate handicap	8	40	1	5
Severe handicap	2	10	1	5

Table 3 compares the pre-test and post-test values of quality of life among the experimental group I (GSE). The mean quality of life score decreased from 42.4 in the pre-test to 35 in the post-test, with a mean difference of 7.4. The standard deviation was 10.15 for the pre-test and 11.27 for the post-test. The paired ‘t’ value was 17.14, and the p-value was 0.0001, indicating a statistically significant improvement in the quality-of-life post-intervention at the  $p < 0.05$  level. This suggests that the intervention had a positive effect on the quality of life among the participants.

**Table 3:** Comparative mean, mean difference, standard deviation and paired ‘t’ value between pre test and post - test values of quality of life among experimental group I (GSE)

Group	Mean	Standard deviation	Mean difference	paired ‘t’ value	p value
Pre-test	42.4	10.15	7.4	17.14	0.0001
Post-test	35	11.27			
Significant at level of $p < 0.05$					

Table 4 compares the pre-test and post-test values of quality of life (QOL) among the experimental group II (BDE). The mean QOL score decreased from 31.85 in the pre-test to 25.75 in the post-test, with a mean difference of 6.1. The standard deviation was 10.68 for the pre-test and 10.87 for the post-test. The paired t-test value of 15.37 and a p-value of 0.0001 indicate that the reduction in QOL scores is statistically significant. This suggests that the Brandt-Daroff exercises had a meaningful positive impact on improving the quality of life for the participants.

**Table 4:** Comparative mean value, mean difference, SD and paired ‘t’ value between pre and post-test values of QOL among experimental group II (BDE)

Test	Mean	Standard deviation	mean difference	paired ‘t’ test	p value
Pre-test	31.85	10.68	6.1	15.37	0.0001
Post-test	25.75	10.87			

Table 5 compares the pre-test scores of quality of life (QOL) between experimental group I (GSE) and experimental group II (BDE). Group A (GSE) had a mean score of 7.4, while Group B (BDE) had a mean score of 6.1, resulting in a mean difference of 1.3. The unpaired t-test value of 3.16 and a p-value of 0.003 indicate that the difference in pre-test scores between the two groups is

statistically significant. This suggests that there was a notable difference in the initial quality of life scores between the groups before the interventions were applied.

**Table 5:** Comparative mean value, mean difference, SD and unpaired 't' test value of pre-test score of quality of life between experimental group I and II (gaze stability exercise and brandt-daroff exercise)

Pre-Test	mean	mean difference	unpaired 't' test	p value
Group A (GSE)	7.4	1.3	3.16	0.003
Group B (BDE)	6.1			

### Conclusion

In conclusion, the study demonstrates that Group A (GSE) significantly outperformed Group B (BDE) in improving the quality of life (QOL) for BPPV patients. The average score for Group A was 38.8, compared to 27.45 for Group B, with a mean difference of 11.35. Both interventions showed significant improvements from pre-test to post-test, with statistically significant p-values (0.0001) indicating meaningful positive impacts. The unpaired t-test value of 3.49 and a p-value of 0.001 further highlight the significant difference between the groups, confirming that GSE is more effective than BDE. This suggests that GSE, by habituating the CNS and strengthening the VOR, reduces episodes of dizziness more effectively. Consequently, GSE should be considered a first-line intervention for BPPV patients to enhance their quality of life and reduce the recurrence of dizziness.

**Conflict of Interest:** Not available.

**Financial Support:** Not available.

### References

- Zhou F, Yu B, Luo J, Ma Y, Li J, Zhang T, *et al.* Global trends in the research on benign paroxysmal positional vertigo: A 20-year bibliometric and visualization analysis. *Front Neurol.* 2022;17(13):1046257.
- Rodrigues DL, Ledesma ALL, Pires de Oliveira CA, Bahmad F. Effect of Vestibular Exercises Associated with Repositioning Maneuvers in Patients with Benign Paroxysmal Positional Vertigo: A Randomized Controlled Clinical Trial. *Otol Neurotol.* 2019;40(8):824-829.
- Balatsouras DG, Koukoutsis G, Fassolis A, Moukos A, Apris A. Benign paroxysmal positional vertigo in the elderly: current insights. *Clin Interv Aging.* 2018;13:2251-2266.
- Aldawsary N, Almarwani M. The combined effect of gaze stability and balance exercises using telerehabilitation in individuals with vestibular disorders during the COVID-19 pandemic: A pilot study. *PLoS One.* 2023;18(5):e0282189.
- Muthusamy J, Vediappan V. The effect of gaze stability exercises on balance and gait in elderly population-A comparative study. *Neurol J.* 2022;4(1):14-20.
- Gazbare PS, Rawtani ND, Rathi M, Palekar TJ. Effect of Yogasanas Versus Gaze Stability and Habituation Exercises on Dizziness in Vestibular Dysfunction. *Neurol India.* 2021;69(5):1241.
- Teixido M, Casserly R, Melley LE. Lateral modified Brandt-Daroff exercises: a novel home treatment technique for horizontal canal BPPV. *J Int Adv Otol.* 2021;17(1):52.
- Sah RK, Walton M, Paul N, Ross AC. Brandt-Daroff Exercise versus Standard Technique on Symptoms Experienced by Patients with Benign Paroxysmal Positional Vertigo in a tertiary Care hospital: A Comparative Study. *MedS Alliance J Med Med Sci.* 2022;2(4):71-76.
- Monem AAEM El, Deeb H El, Ahmed Mohamed Eldesoky H, Mahmoud Elrefaey N. On Effect of Epley's Maneuver and Brandt-Daroff Exercises on Decreasing Severity and Recurrence of Benign Paroxysmal Positional Vertigo. *Egypt J Health.* 2023;14(1):1016-1029.
- Abdou El-M El-Monem El-Deeb H, Ahmed Mohamed Eldesoky H, Mahmoud Elrefaey N. Effect of Epley's Maneuver and Brandt-Daroff Exercises on Decreasing Severity and Recurrence of Benign Paroxysmal Positional Vertigo. *Egypt J Health Care.* 2023;14(1):1016-1029.
- Sah RK, Walton M, Paul N, Ross AC. Brandt-Daroff Exercise versus Standard Technique on Symptoms Experienced by Patients with Benign Paroxysmal Positional Vertigo in a tertiary Care hospital: A Comparative Study. *MedS Alliance J Med Med Sci.* 2022;2(4):71-76.
- Dhote SB, Bele AW. A Protocol on Effect of Gaze Exercises and Balance Regimen on Quality of Life of Patients with Peripheral-Vertigo. *Indian J Forensic Med Toxicol.* 2021;15(2):753.
- Duracinsky M, Mosnier I, Bouccara D, Sterkers O, Chassany O. Working Group of the Société Française d'Oto-Rhino-Laryngologie (ORL). Literature review of questionnaires assessing vertigo and dizziness, and their impact on patients' quality of life. *Value Health.* 2007;10(4):273-284.
- Whitney SL, Marchetti GF, Morris LO. Usefulness of the dizziness handicap inventory in the screening for benign paroxysmal positional vertigo. *Otol Neurotol.* 2005;26(5):1027-1033.
- Alashram AR. Effectiveness of brandt-daroff exercises in the treatment of benign paroxysmal positional vertigo: A systematic review of randomized controlled trials. *Eur Arch Otorhinolaryngol.* 2024;281(7):3371-3384.

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