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The Effectiveness of Vestibular Rehabilitation and Balance Exercises in Improving Patients with Inner Ear Balance Disorder

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ABSTRACT

"Objective: This study aimed to investigate the effectiveness of vestibular rehabilitation and balance exercises in ameliorating symptoms in patients with inner ear balance disorders. Design: This 12-week experimental study

Patients: Four female patients with inner ear disorders participated in the study; one patient dropped out, resulting in a final sample of three participants who completed all interventions. Results: Significant improvement was observed in the balance scale, with a percentage change ranging from 33.3% to 100%, averaging 66.7%. For vertigo, a 100% reduction in symptoms was noted.

1. INTRODUCTION

The vestibular system, located in the inner ear, plays a crucial role in balance and spatial orientation, functioning as the primary sensory system for detecting head movement and maintaining equilibrioception (Day & Fitzpatrick, 2005). Dizziness, while a common complaint, is not considered a normal physiological state (Huang & Ting, n.d.). It can significantly impair functional activities, such as daily tasks, occupational performance, and ambulation (Hecht et al., 2024). The primary objective in managing vestibular neuritis is symptom control. To achieve this, healthcare providers may implement the following strategies. This therapeutic approach utilizes specific exercises designed to retrain the brain and enhance the body's ability to compensate for vestibular deficits, ultimately reducing symptoms such as vertigo and imbalance (Hall et al., 2022). These exercises, such as the Cawthorne-Cooksey exercises, have been shown to be effective in treating both vestibular and non-vestibular balance issues (Asif et al., 2022).

2. METHOD

This case study was conducted at the Physical Therapy Department of Abu Salim Accident Hospital, where patients underwent a series of twelve sessions beginning on July 3.

Sessions were scheduled three times per week, with each session lasting between one and one and a half hours for all patients.The most frequently reported symptoms among the patients included dizziness and balance disturbances.

Patients were selected for this study based on the following inclusion criteria:

Each patient's balance was assessed using the Y-Balance Test, which was employed to quantify their balance capabilities. The test setup involved a Y-shaped apparatus or tape placed on the floor to replicate this configuration.

3. ETHIC APPROVAL

For research to be considered ethical, it must receive approval from a scientific research ethics committee located in the same region where the research is being conducted.

4. RESULT

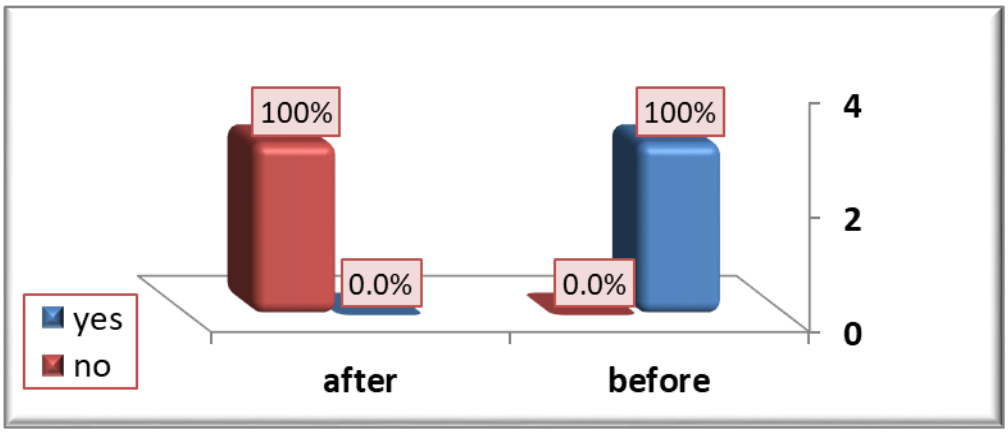
This section presents the statistical analysis of data collected from three female patients, focusing on their health status before and after treatment.

As presented in Table 1

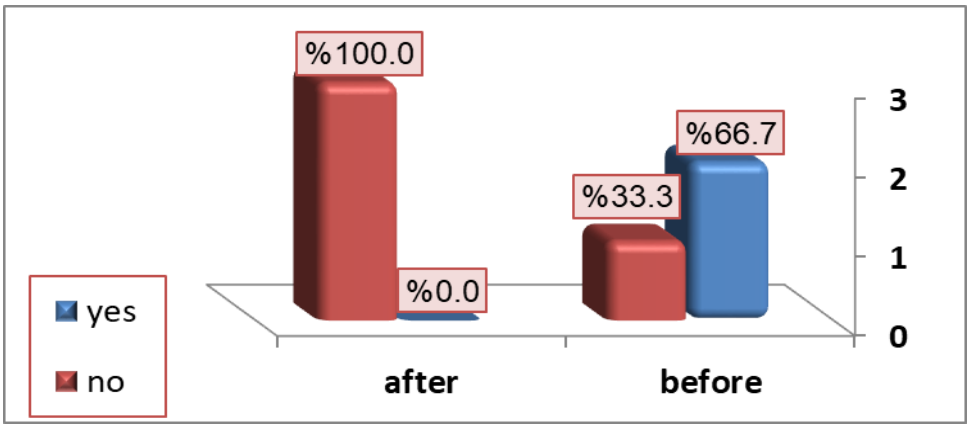
Questions	Case number	Before	Mean	Std. D	After	Mean	Std. D
Experience spells of vertigo	1	Yes	1.0	0.000	No	2.0	0.000
	2	Yes			No		
	3	Yes			No		
independent in self-cure activities	1	yes	1.33	0.577	Yes	1.0	0.000
	2	yes			Yes		
	3	No			Yes		
Can you drive	1	yes	1.33	0.577	Yes	1.33	0.577
	2	no			No		
	3	yes			Yes		
the daytime	1	yes	1.33	0.577	Yes	1.33	0.577
	2	no			No		
	3	yes			Yes		
the nighttime	1	no	1.67	0.577	No	1.67	0.577
	2	no			No		
	3	yes			Yes		
vertigo spontaneous, induced by motion induced by position changes	1	yes	1.0	0.000	No	2.0	0.000
	2	yes			No		
	3	yes			No		
Are you working	1	yes	1.33	0.577	Yes	1.33	0.577
	2	no			No		
	3	yes			Yes		
experience a sense of being off-balance	1	no	1.33	0.577	No	2.0	0.000
	2	yes			No		
	3	yes			No		

all three participants reported experiencing episodes of dizziness prior to treatment. Specifically, Participant 3 demonstrated improved independence in self-management activities, and post-treatment, reported a reduction in both spontaneous and motion-induced dizziness.

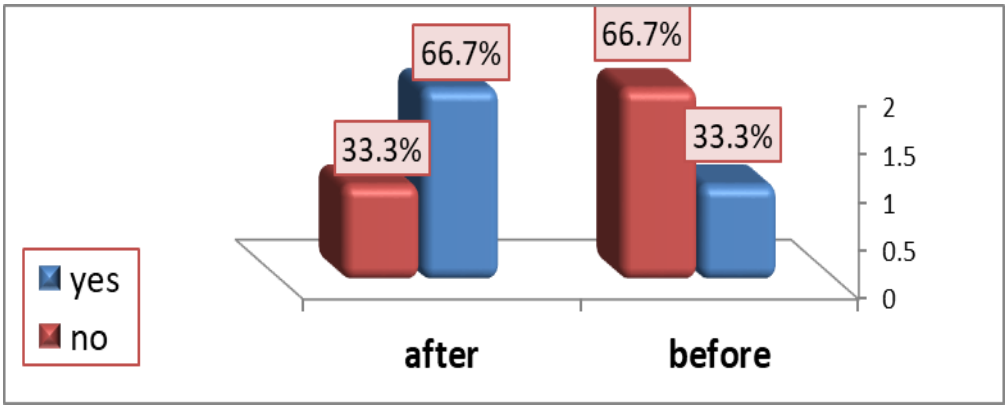
"The mean response before treatment was 1.0, which increased to 2.0 after treatment.



Figures1: shows the distribution of sample members according to Experience spells of vertigo



Figures 2: shows the distribution of sample members according to their suffering from a medical disability before and after



Figures 3: shows the distribution of sample members according to their exposure to stumbling and swaying before and after treatment

illustrate the distribution of responses across participants regarding the questionnaire items.

5. DISCUSSION

This study aimed to evaluate the efficacy of combining vestibular rehabilitation exercises with balance exercises in ameliorating symptoms associated with inner ear disorders, including dizziness, impaired balance, reduced walking ability, and diminished overall physical activity levels.

During the initial sessions, patients reported severe dizziness and impaired balance during ambulation and daily activities, which frequently resulted in falls and necessitated limitations, such as refraining from driving.

6. CONCLUSION

In conclusion, this study confirms a significant improvement in balance and a substantial reduction in dizziness levels among patients with inner ear disorders following the integration of vestibular rehabilitation exercises with balance exercises.

Despite these positive outcomes, the limited sample size may restrict the generalizability of the results. This highlights the necessity for future studies with larger cohorts to achieve a more comprehensive understanding of the effectiveness and impact of these exercises.

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