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The effect of brain gym exercises on visual acuity in physiotherapy students

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Abstract
Background: Physiotherapy students are exposed to prolong near work, screen use, and visually demanding academic tasks, predisposing them to visual fatigue and myopia-related discomfort. Brain Gym exercises are movement-based activities designed to enhance brain-body coordination and visual-motor integration.
Aim: To evaluate the effect of Brain Gym exercises on visual acuity and visual functioning among physiotherapy students.
Method: A pre-experimental pre-post study was conducted on 53 physiotherapy students with myopia. Visual acuity was assessed using the logMAR chart and visual functioning using the Visual Functioning Questionnaire (VFQ). Participants performed selected Brain Gym exercises for 20 minutes daily for 4 weeks. Paired t-test was used for analysis.
Results: There was no statistically significant change in logMAR visual acuity ($p > 0.05$). However, VFQ scores showed a highly significant improvement post-intervention ($p < 0.0001$).
Conclusion: Brain Gym exercises do not alter refractive visual acuity but significantly improve visual comfort, functional vision, and visual performance in physiotherapy students.

Keywords: Brain Gym, visual acuity, logMAR, visual fatigue, myopia, physiotherapy students

Introduction

Vision plays a crucial role in learning, motor coordination, and clinical observation in physiotherapy education. Students are required to read dense text, interpret images, observe movement patterns, and work extensively on digital platforms. Prolonged near work and screen exposure predispose them to visual strain and myopia-related discomfort.

Visual acuity is commonly measured using logMAR charts, which provide standardized and sensitive measurement compared to Snellen charts. However, visual acuity alone does not reflect visual performance during daily academic tasks. Therefore, subjective tools such as the Visual Functioning Questionnaire (VFQ) are important to evaluate functional vision.

Brain Gym, developed under Educational Kinesiology, consists of 26 movements aimed at enhancing brain-body integration, eye-hand coordination, and visual tracking. Many of these exercises directly engage ocular tracking, midline crossing, and postural alignment, suggesting potential benefit for visual performance.

Very few studies have investigated the direct effect of Brain Gym on visual parameters. Hence, this study was undertaken.

Materials and Methods

Study design: Pre-experimental pre-post study
Sample size: 53
Sampling: Convenience sampling
Study duration: 6 months
Intervention duration: 4 weeks
Study setting: RJSCOPT, Kopargaon

Participants

Physiotherapy students aged 18-25 years diagnosed with myopia.

Inclusion Criteria

- Age 18-25 years
- Diagnosed myopia
- Willing to participate
- Available for 4 weeks

Exclusion Criteria

- Other ocular disorders (astigmatism, strabismus, amblyopia)
- Neurological or psychiatric disorders
- Recent eye surgery
- Congenital visual deformities
- Prior Brain Gym training in last 6 months

Outcome Measures

Objective
LogMAR Visual Acuity Chart

Subjective
Visual Functioning Questionnaire (VFQ-25)

Procedure

- Ethical approval and consent obtained
- Baseline assessment using logMAR and VFQ
- Brain Gym exercises performed daily (Lazy 8s, Cross Crawl, Brain Buttons, Hook-ups, Energy Yawn, Thinking Cap, Owl) for 20 minutes for 4 weeks
- Post-assessment using same tools

Statistical Analysis

Software: GraphPad Instat v10
Normality: Shapiro Wilk test
Test used: Paired t-test
Data expressed as Mean ± SD

Results

Table 1: Comparison of logMAR Visual Acuity

Variable
Pre (Mean ± SD)
Post (Mean ± SD)
P value
LogMAR
0.005 ± 0.018
0.005 ± 0.018
>0.05
No significant change in visual acuity

Table 2: Comparison of Visual Functioning Questionnaire Scores
Variable
Pre (Mean ± SD)
Post (Mean ± SD)
P value
VFQ Score
3.31 ± 0.20
2.37 ± 0.18
<0.0001
Highly significant improvement in visual functioning

Discussion

The present study aimed to evaluate the effect of Brain Gym exercises on visual acuity and visual functioning in physiotherapy students.

The results demonstrated no change in logMAR visual acuity after 4 weeks of Brain Gym exercises. This indicates that Brain Gym does not influence refractive components of vision such as axial length or optical power.

However, there was a very significant improvement in VFQ scores, indicating enhanced visual comfort, reduced eye strain, and improved visual performance during academic tasks.

This supports the concept that Brain Gym improves visual-motor integration, ocular muscle relaxation, posture, and visual attention, rather than optical acuity.

These findings align with studies showing that movement-based visual training improves eye coordination and reduces visual fatigue without changing refractive error.

Thus, Brain Gym acts as a functional visual rehabilitation tool, not a refractive correction method.

Conclusion

Brain Gym exercises do not improve objective visual acuity measured by logMAR chart. However, they significantly enhance visual functioning, comfort, and performance in physiotherapy students with myopia. Brain Gym can be recommended as a simple, non-invasive strategy to reduce visual fatigue in students.

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