

CODE: ABS 032

## **EFFECTIVENESS OF PLAY-BASED AEROBIC AND INTERACTIVE REACTION LIGHT TRAINING ON EXERCISE TOLERANCE, VISUOMOTOR INTEGRATION AND HEALTH-RELATED QUALITY OF LIFE IN CHILDREN LIVING WITH HIV: A PILOT STUDY.**

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**Background:** Children living with Human Immunodeficiency Virus (HIV) often exhibit reduced exercise tolerance, impaired visuomotor integration and poor health-related quality of life due to chronic disease burden and long-term therapy. There is a need for engaging, child-friendly interventions that target both physical and cognitive domains. Play-based interventions, which are inherently motivating and developmentally appropriate, have been shown to improve participation and adherence in children. Similarly, interactive reaction light training provides visual stimuli that enhance coordination, reaction time, and cognitive processing.

**Purpose:** This pilot study aimed to evaluate the effectiveness of play-based aerobic exercise combined with interactive reaction light training in this population.

**Methods and Materials:** A randomized controlled pilot study was conducted with 7 participants allocated into an experimental group receiving play-based aerobic and reaction light training and a control group receiving conventional physiotherapy alone. Outcome measures included the 6-Minute Walk Test (6MWT), Bender Gestalt Test (BGT), and QoL-CHAI questionnaire. Data were analyzed using paired and independent t-tests with significance set at  $p < 0.05$ .

**Results:** Both groups showed significant improvements ( $p < 0.05$ ). However, the experimental group demonstrated greater improvement across all outcomes compared to the control group. Post-test analysis revealed significant differences favoring the experimental group.

**Conclusion:** Play-based aerobic exercise combined with interactive reaction light training is more effective than conventional physiotherapy in improving physical capacity, visuomotor integration and quality of life in children living with HIV. Integrating play-based aerobic and reaction light training in pediatric HIV rehabilitation to enhance physical, cognitive outcomes, improve engagement, and guide evidence-based physiotherapy practice.

**Keywords:** Play-based aerobic exercise, Interactive reaction light training, Exercise tolerance, Visuomotor integration, Human Immunodeficiency Virus.