

# Evaluation of Horse Riding Simulator with Strengthening Training Program and Conventional Physiotherapy in treatment of Children with Spastic Diplegic Cerebral Palsy

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## Abstract

**Background:** Cerebral Palsy is a group of disorders that affect the development and growth of the movement leading to the determination in the activities of the body, especially related to movements. These disorders occur as a result of damage or deterioration in certain parts of the brain.

**Objective:** To evaluate the effectiveness of horse riding simulator with strengthening training program on children with spastic diplegic cerebral palsy and comparing it with conventional physiotherapy program which is used in rehabilitation.

**Patients and Methods:** Thirty participants were recruited in this study, who were diagnosed with spastic diplegic cerebral palsy. Their ages between four and twelve years old, the children were randomly classified into three groups of interventions (Horse Riding Simulator with Strengthening Training, Horse Riding Simulator with conventional physiotherapy and control group with conventional physiotherapy). For each intervention, the children receive 24 sessions three times a week, [Gross Motor Function Measure-66, pediatric balance scale, and Modified Modified Ashworth Scale] were used to evaluate children in all groups both pre and post each intervention.

**Results:** Post-intervention in the groups of horse riding simulator and strengthening training and horse riding with conventional physiotherapy shows significantly improved in gross motor function measures -66 ( $P=0.021$ ), ( $P=0.001$ ) respectively, while no significant difference have been noted in conventional physiotherapy group. On the other hand, no significant improvement have been shown in all intervention groups in Pediatric Balance Scale. Furthermore, muscle tone reduced with a too small value of significant improvement in a group of horse riding simulator with strengthening training in adductor muscle of hip joint for right and left leg ( $P=0.052$ ), ( $P=0.059$ ) respectively, while no significant differences have been reported in other studies groups, there was no significant improvement have been shown in muscle tone for knee extensor and ankle plantar flexors except too small values close to significant level in the ankle plantar flexors for the right leg in a group of horse riding with strengthening training ( $P= 0.050$ ).

**Conclusion:** The evidence from this study confirmed that horse riding simulator with strengthening training has a positive effect on (GMFM-66) and could reduce spasticity in the muscle for children with spastic diplegia cerebral palsy.

**Key words:** Cerebral Palsy, Spastic Diplegia, Horse Riding Machine, Strengthening Training, Balance.

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