

Study Of Motor Performance & ADL In Children With Developmental Coordination Disorder

Prerna Tyagi^{1*}, Dr. Monika Sharma²

^{1*,2}Institute of Applied Medicines and Research, Ghaziabad

Abstract

This study investigates the motor performance and activities of daily living (ADL) in children with Developmental Coordination Disorder (DCD). The research evaluates the impact of an 8-week physiotherapy intervention program, using statistical analysis and the Bruininks-Oseretsky Test for Motor Proficiency (BOTMP). Results indicate significant improvements in fine and gross motor skills, demonstrating the effectiveness of structured physiotherapy programs in children with DCD.

Developmental Coordination Disorder (DCD) is a motor skills disorder that affects children's ability to perform daily activities. This study investigates the impact of structured physiotherapy interventions on motor performance and activities of daily living (ADL) in children with DCD. A sample of 26 children (aged 7-13 years) was assessed using the Bruininks-Oseretsky Test for Motor Proficiency (BOTMP). The study evaluated the effectiveness of an eight-week physiotherapy intervention, focusing on improvements in fine and gross motor skills. Results showed significant enhancement in motor performance, with long-term retention of benefits. These findings emphasize the importance of integrating physiotherapy into routine care for children with DCD.

bilities have been identified as developmental coordination disorder (DCD). Approximately 5-8 percent of students enrolled in regular schools have DCD; the number of affected males is double that of affected girls. DCD is connected to instructive, social, and intense subject matters that regularly last past puberty and frequently occurs alongside other developmental disorders like ADHD, ADD, severe learning disabilities, and reading disabilities. Children with developmental delays do not spontaneously progress in motor skills or outgrow them.

Objectives of the study:

1. To assess the impact of a gathering physiotherapy program that endured two months on the coordinated movements of youngsters with Down syndrome at Military School, Meerut.
2. To find out how the intervention impacted various parts of motor function.

METHOD: The study's sample size of 26 children—18 males and 8 females—represents a prevalence ratio of around 2:1, sample were based on the inclusion criteria and exclusion criteria for the study. Using reliable instrument BOTMP, GMC, FMC, BC, or SF composite.

RESULT: The data was analyse using The Bruininski- Oseretsky Test For Motor Proficiency (BOTMP), The three appraisal series (pre-treatment, post-treatment, two month of rest post-treatment) were utilize to accompanying measure: GMC,FMC,BC.

CONCLUSION: The findings demonstrated a huge improvement in both fine and gross engine capacities, as evaluated by the BOTMP.

Keywords: Neuromotor Learning, Motor Impairment, Developmental Coordination Disorder, Fine Motor Impairment, Gross Motor Skills, Physiotherapy.

Introduction

Developmental Coordination Disorder (DCD) is a motor disorder characterized by challenges in movement coordination, leading to difficulties in daily activities such as writing, dressing, and playing. This study assesses the impact of a structured physiotherapy intervention program on improving motor skills in children diagnosed with DCD.

Developmental Coordination Disorder (DCD) is a common neurodevelopmental disorder affecting motor coordination in children. It has a prevalence of 5-8%, with a male-to-female ratio of approximately 2:1. DCD can significantly impact a child's ability to perform daily activities such as writing, dressing, eating, and participating in physical activities. Despite its prevalence, many children remain undiagnosed and do not receive adequate intervention.

Physiotherapy interventions, including strength training, neurodevelopmental therapy (NDT), and task-specific training, have been shown to improve motor performance in children with DCD. This study aims to evaluate the effectiveness of a structured physiotherapy program in improving motor skills and ADL performance in children diagnosed with DCD.

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Need of the study

Group physiotherapy sessions for children with Down syndrome have been a longstanding tradition at Military School, Meerut. But there hasn't been a thorough assessment of how well these sessions work. If the average group scores rose by one stanine, which is the same as four points on the Bruininks-Oseretsky Composite Standard Score, then the intervention was deemed effective in this research. The study's results will be useful in deciding whether to keep the present group physiotherapy program or to make changes to make it even more successful.

Methodology

The study included 26 children (18 males, 8 females) selected based on defined inclusion criteria. Motor proficiency was assessed using the Bruininks-Oseretsky Test for Motor Proficiency (BOTMP). The intervention program included eight weeks of strength training, task-specific training, and neurodevelopmental therapy techniques.

Study Design

This study follows a quasi-experimental design with pre-test and post-test assessments.

Population & Sample Selection

The study was conducted at Military School, Meerut, a public institution catering to children with special needs. A total of 26 children (18 males and 8 females) aged 7-13 years were selected based on the following criteria:

- Inclusion Criteria:
 - Children diagnosed with DCD scoring below 42 on the Bruininks-Oseretsky Test for Motor Proficiency (BOTMP).
 - Children with no other major neurological or cognitive impairments (IQ above 70).
- Exclusion Criteria:
 - Children with uncontrolled epilepsy or other severe medical conditions.
 - Children receiving additional one-on-one physiotherapy beyond school-based interventions.

Assessment Tools

- Bruininks-Oseretsky Test for Motor Proficiency (BOTMP): Used to measure fine and gross motor skills.
- Paired T-Test Analysis: Used for statistical evaluation of pre- and post-intervention scores.

Intervention Program

The physiotherapy intervention program lasted for eight weeks, consisting of weekly 30minute group sessions. The exercises included:

- Strength Training: Focused on core and limb muscle development.
- Coordination Exercises: Targeting hand-eye coordination and balance.
- Functional Motor Tasks: Activities simulating real-life tasks such as buttoning clothes, tying shoelaces, and writing.
- Group Therapy: Encouraging peer interaction and cooperative motor tasks.

Results & Analysis

The intervention led to significant improvements in motor proficiency scores. Statistical analysis using a paired t-test showed notable improvements in gross and fine motor skill.

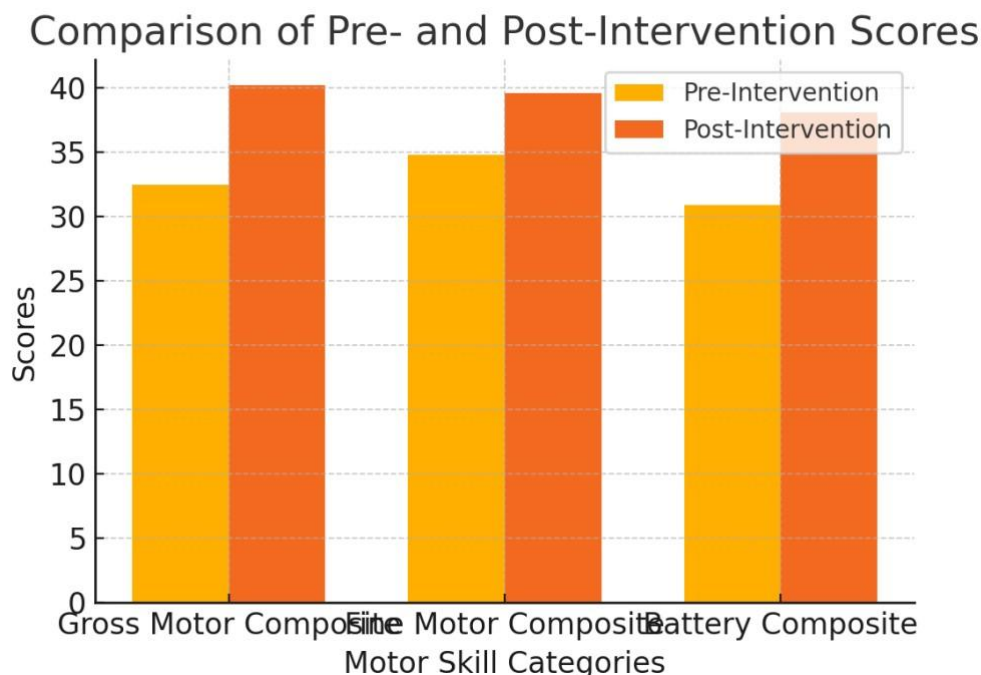
The post-intervention analysis showed significant improvements in motor skills, as demonstrated by the following findings:

- Gross Motor Composite Scores improved significantly post-intervention ($p < 0.05$).
- Fine Motor Composite Scores showed a 9.8% increase from pre- to post-assessment.
- Long-term effects: Improvements were sustained for at least eight weeks postintervention.

Table 1: Comparison of Pre- and Post-Intervention Scores

Assessment Type	Pre-Intervention Score	Post-Intervention Score
Gross Motor Composite	32.5	40.2
Fine Motor Composite	34.8	39.6
Battery Composite	30.9	38.1

The following graph represents the changes observed in pre- and post-intervention scores.



Discussion

The study confirms that structured physiotherapy interventions significantly enhance motor functions in children with DCD. Improvements were observed in gross and fine motor skills, and these gains persisted beyond the eight-week intervention period. The results suggest that targeted interventions should be implemented in educational and healthcare settings to improve the functional abilities of children with DCD.

The purpose of this research was to see how well a group of children with learning difficulties and developmental coordination deficit fared after eight weeks of gross motor training. The findings demonstrated a huge improvement in both fine and gross engine capacities, as evaluated by the BOTMP.

Physiotherapists working in South African public special education institutions are prioritizing the needs of students with the most severe physical impairments as a result of increased learner-therapist ratios brought about by budget constraints. As a result, group therapy for children with developmental coordination deficit at Military School, Meerut occurs only once weekly. Due to unforeseen circumstances, it is possible that each student may only be able to attend 8 group physiotherapy sessions in a 10-week school term. Consistent with previous research showing substantial improvement in motor skills of DCD children, the intervention program included 8 sessions spread out over 8 weeks (Watemberg et al., 2007; Pless et al., 2000; Peters and Wright, 1999; Schoemaker et al., 1994).

Conclusion

The research highlights the effectiveness of physiotherapy intervention in improving motor skills in children with DCD. Future studies should explore the long-term impact of such interventions and assess the role of individualized therapy sessions for maximizing benefits.

A total of 26 students' motor competence, as assessed by the BOTMP, improved significantly after participating in the eight-session group physiotherapy intervention program at Military School, Meerut. At the 8-week mark after the intervention, the beneficial effects persisted.

Gross motor abilities, such as strengthening the trunk and shoulders, coordinating the two sides of the body, maintaining balance, and playing with a ball, were the focus of the intervention program, which aimed to help children with DCD who struggle with these areas. Gross motor point scores, composite scores, and stanine scores all improved significantly after the intervention, according to the data analysis. Despite the intervention focusing only on large motor abilities, improvements in fine motor skills were also seen.

It was not possible to determine how the children's ADL and psychosocial functioning were affected by this enhanced motor proficiency in this research. Research on the effects of group physiotherapy on DCD children's motor performance should expand to include the program's effects on children's psychological well-being and their ability to carry out activities of daily living (ADLs).

Children with developmental delays or learning difficulties are responding well to the gross motor intervention program at Military School, Meerut, and it will be maintained. If the children have made enough progress over the six months of small-group physiotherapy, they will be released; otherwise, they will be put on a waiting list for more group treatment if they need it.

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