

# Evaluation of Physical Fitness in Primary School Children with Developmental Coordination Disorder- Pilot Study

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## Abstract

Children with developmental coordination disorder (DCD) were not physically fit and not motivated to get engaged in physical activities. When the peer group children get easily adapted to games in green land, the child with DCD will get anger and frustration in order to learn the play and to make themselves adapted to it and to learn it. The current study examines the physical fitness and exercise capability in children with DCD. 10 children were included in the study with age range from 7 to 9 years. Children were included into the study after baseline evaluation with DCDQ. All children were instructed to perform the five-jump test (5JT), the triple-hop distance (THD). Pre test and post test scores includes Walking 6-min walking test (6MWT) in order to assess the exercise capability. DCD children had poor scores on the THD and 5JT. Moreover, children with DCD had difficulty performing 6MWT. In conclusion, the present study revealed that exercise tolerance in children with DCD is poor and adequate interventions should be prescribed with individually tailored protocol.

**Keywords:** DCD, 6MWT, Primary School Children, Exercise Capacity, Physical Fitness

## INTRODUCTION

Developmental coordination disorder (DCD) is a condition that affects the motor coordination and it affects nearly 8% of primary school children (Ganapathy Sankar, 2019)<sup>1</sup>. The characteristic feature of DCD is motor coordination difficulty and it directly affects activities of daily living skill and it had a greater impact on the academic activities of the child. Children find it difficult to write, difficult to clinically reason the availability of space and lines to write and because of these coordination difficulty these children with DCD faces academic failure. Performing and participating in physical activity session is difficult for these children. Because of the difficulty in coordination, they experience trouble in riding a bicycle or catching a ball as these activities require bilateral integration (ganapathy sankar & Monisha, 2018)<sup>2</sup>. To classify these children under the category of DCD, they should be assessed in the baseline evaluation which is done by the primary researcher in all the primary schools were the participants were included. A child with DCD shouldn't have pervasive developmental disorder or other intellectual or neurological defect. Few parents had a false perception on the diagnosis of their child. They imagine that, DCD will cure on its own as their child age, they will be free from their coordination problem and they outgrew of the condition. Increasingly, literature search have identified that a child with DCD experience problems in performing fine motor skills, gross motor skills, or both. Terms which is used to identify the child with DCD in the past is very confusing in the literature which we explore before decades, often researcher used to describe a child with DCD as "awkward", "clumsy", or couch potato. Other terms this appears in the literature such as "developmental dyspraxia", "apraxia", and "minimal brain dysfunction". It is challenging for the therapist and pediatrician in the clinical setting to identify a child with DCD as due to the inconsistency among the assessment

tools that identify DCD. Developmental Coordination Disorder Questionnaire (DCDQ), is used in the current study for the baseline screening. In recent years, DCD children were exposed to cardiovascular abnormality as because of low physical fitness and exercise capability. Child with DCD avoids participation in play at green land. In fact, children with DCD were more exposed to cardiovascular disorders as because of the obesity and poor physical activity<sup>3</sup>. There is a alarming risk for cardiovascular disease and decreased participation in physical activity. Children with DCD avoid physical activity with peer groups. They feel isolated and this has increased depression and social negativism. The sedentary lifestyle practiced by children with DCD affects the cardiovascular health.

## METHODOLOGY

The study before pilot testing has been approved by the department of occupation therapy, SRM Institute of science and technology. Prior to testing, the protocol was explained by the primary researcher Dr. Ganapathy sankar in detail to the parents. written informed consent was signed by all participants. A total of 15 children were selected from five primary schools in and around chennai; all children were screened using DCDQ. Five children were not included because of the presence of hearing impairment. In total, 10 children with DCD underwent pilot testing.

Age group of the participants lies between 7 to 9 years after the participants were explained about the study, they underwent the baseline physical examination by the physician to understand their vitals and their cardiovascular fitness in order to perform the physical fitness test. The child with DCD and his physical state needs approval from the physician to began the test and after the physician approval, the children were demonstrated with

the tests they were going to perform. The participants were examined by a physician to ensure the children with DCD were free from other chronic lung and heart diseases. Children with IQ less than 70% and with pervasive developmental disorder and with any neurological impairment were excluded out from the study and children who fall under the suspect category with DCDQ were included. Information sheet which describes the whole study were issued in bi-language to all the parents of children with DCD. Nature of the study is explained to the parents. Written informed consent forms were signed by parents after reading the information sheet and they were free to contact the primary researcher at any time during their participation and after participation in the research. Mobile number of the primary researcher is circulated to all the participants for their ease to contact at any time.

A total of 10 children were included in the pilot testing and every child's original identity is hidden and they were provided with the specific placebo number to increase the confidentiality. Physical fitness was tested in the primary schools during the child's physical education periods at the school sports hall. Each child is instructed to dress comfortably and it should be free and should allow sufficient ease to perform movement comfortably and completely. Children were instructed to perform the physical fitness test individually and the assessment is performed by the secondary researcher. Each fitness test is demonstrated and explained properly to the child with DCD before final attempt of scoring the evaluation sheet. Practice trail of 3 attempts were given before filling up the scoring in the final evaluation sheet. During each physical fitness test, children received a strong verbal motivation to boost the performance to maximum scores. If any child finds difficulty to deal with physical fitness test, if any error they have made, re-demonstration of task should be performed and finally 6MWT should be performed by the child. The triple hop test is used in the current study to assess the child's physical fitness state and the test is used to examine the lower extremity strength and power. A tape was adhered to the ground and perpendicular to the tape to measure the triple hop distance. the primary researcher mark the distance from the ground to the point where heel struck the ground. Initial practice attempts were allowed and arm swing is allowed. Five jump test is used to analyze the lower limb explosive power and it measures the horizontal distance covered using lower limb actions. From the initial baseline position, the child is instructed to jump to the front with one leg and instructions were given to finish the last fifth stride by landing on both feet together.

The 6MWT was conducted at the primary school over a on a flat surface in a 30-m-long covered corridor marked every 2m. 6MWT was carried out by the primary researcher according to the American Thoracic Society (American Thoracic Society, 2002). Children were allowed to stop and rest during the test, the child will receive the verbal encouragement during the 6mwt and after completion vitals were assessed and if breathlessness is reported it needs documentation.

TABLE 1: Total scores obtained in the physical fitness test among children with DCD

PHYSICAL FITNESS TEST	TOTAL SCORE N=10
Triple hop distance	2.09
5 jump-test	2.25
6MWD	355.89
Dyspnea	2.98
Heart rate before	76.55
Heart rate after	80.45
Oxygen saturation (%) before	99.87
Oxygen saturation (%) after	95.77

### RESULT

When Motor ability of the child is assessed, their exist a significant lower total score and when examining the physical ability of the child using physical fitness test, children with DCD had decreased performance in 5JT and THD.

### DISCUSSION

The Current study documented the physical activity and its significance in children with DCD and it also highlights that Physical inactivity leads to poor exercise capacity and it declines the fitness and wellbeing of children with DCD. Low and poor performance have been documented in triple hop test and 5 jump height. This poor performance as documented in the current study will leads to cardio vascular abnormalities and greater chance of obesity. Ganapathy sankar .(2017) in his research study he have reported that 6.7% of children with DCD were obese and they were at risk of having cardiovascular disorders<sup>4</sup>. As the child with DCD avoids physical activity sessions it affects the physical and psychological wellbeing of these children and they avoid themselves from the family members and friends. They isolate themselves and confound to home, if neglected without much attention, they will be socially isolated and frustrated. This condition if sustained these children were having more chance of getting social negativism<sup>5</sup>.

Limitations: number of children included in the current study is less.

Conclusion: the present study concludes that children with DCD possess poor physical fitness and there is a need for individualized strength training protocol and educational programmes to motivate the parents of child with DCD to encourage their child to have exposure to green land physical activity sessions with peer group.

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