

Assessment of Developmental Co-Ordination Disorder in Normal School Going: A Cross Sectional Study

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ABSTRACT

Introduction: Developmental Co-ordination disorder may occur alone or with other developmental co-ordination disorder such as autism and cerebral palsy. Developmental coordination disorder is a neurodevelopmental condition characterized by poor motor proficiency that interferes with an individual's activities of daily living. Present in approximately 5-6% of school-aged children, developmental coordination disorder is a disability. Hence this study aimed to assess the developmental co-ordination disorder among normal school going children.

Material and methods:- This cross-sectional study was carried out in school on 30 children aged 7 to 12 years. After taking institutional ethical clearance and informed consent the developmental co-ordination disorders were assessed using Developmental Coordination Disorder Questionnaire.

Result: Mean age of participants in the study was 10.7 ± 0.71 . While the mean score for gross motor, fine motor, general co-ordination and total was 26.4 ± 5.3 , 17.05 ± 2.17 , 21.5 ± 3.30 and 65.05 ± 8.6 respectively.

Conclusion: The study concluded that developmental co-ordination disorder is not only seen in children with any neurodevelopmental problems but also affects the healthy children and fine motor components were more affected.

Keywords: Co-ordination, Disorder, Fine Motor, Gross Motor, Healthy Children.

INTRODUCTION

At present approximately in 5-6% of school-aged children, developmental coordination disorder (DCD) is a disability in which a child's motor coordination difficulties significantly interfere with activities of daily living or academic achievement. These children typically have difficulty with fine and/or gross motor skills, with motor performance that is usually slower, less accurate, and more variable than that of their peers.¹

Children with DCD exhibit a diversity of motor signs, including fine and gross motor problems with impaired postural control and balance, and sensorimotor coordination or motorlearning difficulties. The prevalence ranges between 1.8% and 8%, depending on the diagnostic criteria used, based on the cutoff of motor scores from standardized scales.² A large number of school-aged children present with motor-based performance problems that have significant negative effects on their ability to participate fully in the daily activities of home, school, and play. Therapists treating these children have a large number of intervention approaches at their disposal.³

There is no tool that is considered the "gold" standard for identifying children with developmental coordination disorder (DCD) and various techniques have been reported in the research literature.⁴ Prevalence rates are mostly based on cohorts born in the 1980s and 1990s and may not reflect outcomes after the advent of active perinatal care of the most immature children. In addition, there are very few recent studies that have reported associations between DCD and other co morbidities in children born extremely preterm.⁵

Children with developmental coordination disorder (DCD) find themselves less competent than typically developing children with regard to their physical abilities and often experience failure. They are therefore likely to avoid physical activity. Physical inactivity is considered an important risk factor for developing overweight and obesity.⁶

The boundaries between these disorders, especially in developmental age, can be blurred and more often conditions are correlated and collide together.⁷ The Diagnostics Statistics Manual—IV classification for DCD describes difficulties across a range of activities of daily living, impacting on everyday skills and academic performance in school. Recent evidence has shown that difficulties persist into adulthood.⁸ However, it is not known if all adolescents with DCD have additional problems or only those affected with the most severe DCD. Although it might be expected that adolescents who have had severe or long-lasting DCD would also have a generalized effect, i.e., a low self-esteem, so far there is no evidence for this.⁹

Developmental coordination disorder (DCD) is a neurodevelopmental condition characterized by poor motor proficiency that interferes with an individual's activities of daily living. These problems in motor coordination are prevalent despite children's intelligence levels. Common symptoms include marked delays in achieving motor milestones and clumsiness, typically associated with poor

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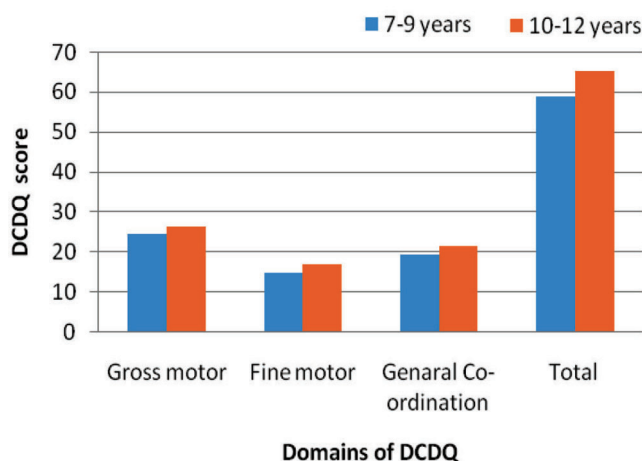
balance, coordination, and especially handwriting skills. Currently, DCD is said to impact about 2–7% of school-age children.¹⁰ Developmental coordination disorder (DCD) affects up to 6% of the population and is diagnosed on the basis of poor motor coordination. Remain through the lifespan for the majority. Reduced physical activity and, outside of the motor domain, significant mental health issues exist for many with DCD.¹¹

MATERIAL AND METHODS

The study commenced after obtaining approval from Institutional Ethics Committee. Total 30 participants aged 7-12 years were included according to inclusion criteria. Then demographic characteristics of participants (age, gender, BMI) were assessed. After that developmental co-ordination disorder was assessed using Developmental Co-ordination Disorder Questionnaire. It has three domains (gross motor, fine motor, general co-ordination and total score) scored on 1 (not at all like your child) to 5 (extremely like your child) likert scale. Data were statistically described in terms of mean ± SD. Statistical analysis was done using Graph Pad Instat Version 3.06

RESULT

Table No. 1 shows the gender wise distribution of data including 7 male and 23 female participants in the study. Table No.2 shows the mean age and BMI of participants and was found to be 9.93±1.36 and 19.2 ± 1.25 respectively. Table No. 3 shows the age wise distribution, mean age of participants in group of 7-9 years and 10-12 years was found to be 8.45±0.82 and 10.78±0.71 respectively. Table No. 4 shows the participants with indication of DCD and results shown that total 3 male participants and 5 female participants have indication of DCD. Graph No.1 shows the age group



Graph-1:- Age group wise distribution of DCD-Q domains

wise distribution of DCDQ domains showing fine motor is more affected than gross motor and general co-ordination while the scores of all domains was found to be less in the age group of 7-9 years than 10-12 years.

DISCUSSION

This study aimed to assess the developmental co-ordination disorder among normal school going children from 7 to 12 years using Developmental Co-ordination Disorder questionnaire. However our study revealed that fine motor activities are more affected than gross motor and general co-ordination. Similar to our study the study performed by Cantell and Smyth et al. who used the best available guidelines and multi stage sampling approach to estimate the prevalence of developmental co-ordination disorder. The prevalence rate obtained using DCD-Q was found to be 18.9%.⁹

In addition, studies have been carried out on 6990 children aged 7 to 8 years who attended the coordination session and completed the writing test or activities-of-daily-living scale. 123 children met criteria for developmental coordination disorder, resulting in a prevalence of 18 of 1000 children at a mean age of 7.5 years, 223 children were considered as having “probable developmental coordination disorder”.¹⁰

Our study also revealed that the female participants was a risk factor for DCD. But the study conducted by Hill L et al. shown that male sex was a risk factor for DCD in general population but not in children born pre term. It is well known that the male sex is a risk factor for neuro- developmental disorders, including CP, autism spectrum disorders and attention deficit disorder.¹¹

Only 23-41% of physicians are familiar with DCD and of those who are aware only 11-59% are knowledgeable about the psychological and secondary consequences of the condition. There is need for greater awareness of DCD and education in the general public and with teachers and physicians specifically. Children with impaired motor co-ordination have difficulty in representing the co-ordinates of intended movements. So, we have proposed that this deficit reflects impairment in the upcoming generation and should

Gender	No. of participants
Male	07
Female	23

Table-1: Gender wise distribution of data

Age (Mean ± SD) years	BMI (Mean ± SD)
9.93 ± 1.36	19.2 ± 1.25

Table-2: Mean age and BMI of participants

Age group (years)	No. of participants	Mean ± SD
7-9	11	8.45 ± 0.8
10-12	19	10.78 ± 0.7

Table-3: Age group wise distribution of participants

Gender	Indication of DCD	
Male	7-9 years	2
	10-12 years	1
Female	7-9 years	1
	10-12 years	4

Table-4: Participants with indication of DCD

be taken into consideration while rehabilitation.

The main limitation of the study was small sample size. Future studies needs to address this limitation. Also need to add the effect of physiotherapeutic intervention on developmental co-ordination disorder.

CONCLUSION

The study concluded that developmental co-ordination disorder also can be seen in normal school going children and fine motor domain of children are morelikely to be affected.

Informed consent

Informed consent of patient is taken.

Conflict of interest

The authors declared no conflict of interests

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