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To study developmental coordination disorder in school going children in Loni

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Abstract
Developmental coordination disorder (DCD) is defined as a condition with significant impairment in the development of motor coordination, which interferes with academic achievement and/or activities of daily living (ADL). Developmental coordination disorder appears to be a common disorder of childhood and is usually recognized in children between 6 years to 12 years of age. But due to lack of awareness about DCD in parents in rural area, this condition is undiagnosed in most of the rural areas. The Developmental Coordination Disorder Questionnaire (DCDQ) is a parent report measure and it is developed to assist early identification of Developmental Coordination Disorder (DCD) in children. Early diagnosis is necessary for better management of DCD, hence this study was undertaken to know the prevalence of DCD so as to create awareness among the people because many children having coordination disorder may go unnoticed. The objective of the study is to study the prevalence of developmental coordination disorder in school going children and its gender wise distribution.100 participants from Ahilyabai Holkar Madhyamik Vidyalaya, Loni were selected randomly. They were between 5 years to 15 years of age. Developmental Coordination Disorder Questionnaire (DCDQ) was filled by the parents of the children. Then the data was collected and analyzed. Data was analyzed using Chi square test. The value of Chi Square test was 2.205, d.f:1 and P:<0.13, statistically not significant. The study concluded that there was 30% of prevalence of indication or suspects of developmental coordination disorder in school going children in Loni and among those participants; boys were having more prevalence of DCD than girls.

Keywords: DCD, DCDQ, Children

1. Introduction
Coordination is defined as movement which is smooth, accurate and purposeful and is brought about by the integrated action of many muscles, superimposed upon a basis of efficient postural activity [1]. Developmental coordination disorder (DCD) is defined by using the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), as a condition with significant impairment in the development of motor coordination, which interferes with academic achievement and/or activities of daily living (ADL) [2].

Developmental coordination disorder appears to be a common disorder of childhood and is usually recognized in children between 6 years and 12 years of age.[3] Boys are more commonly diagnosed with DCD than girls (2:1).Previously DCD occurred in 10% to 19% of school-aged children, but currently the prevalence is expected to be between 5% and 8%, of all school aged children. In India 1.37% (kattankulathur), 19% (Greek), 8% (Canada), 6% (American Psychiatry Association) [2].

Research found that root cause of developmental coordination disorder is unknown. Signs of developmental coordination disorder include: Delayed motor milestones such as sitting, kneeling, half-kneeling, creeping, crawling, standing or walking, clumsiness, slowness and difficulty with fine and gross motor skills like catching a ball, using scissors, handwriting, riding a bike, problem in walking, tripping over feet.[4] Risk factors for DCD are male gender, very preterm birth, small-for-gestational age, independent walking at age 15 months or later, difficulties in attention, social communication, non-word repetition, spelling and reading. Secondary consequences are compromised physical fitness, decreased participation in daily-living, physical and social activities, and hypermobility of joints, mental health difficulties, overweight or obesity [5].

A number of questionnaires have been developed to screen for DCD. Of these, the most well-known is the Developmental Coordination Disorder Questionnaire (DCDQ), which was first published in the American Journal of Occupational Therapy [6]. The Developmental Coordination Disorder Questionnaire (DCDQ) is a parent report measure and it is developed to assist early identification of Developmental Coordination Disorder (DCD) in children [4]. Parent report of children's current skills and deficits has consistently been shown to be a sensitive, reliable, and valid source of information. Parent questionnaires can give qualitative, accurate assessment of their children's skills in a naturalistic environment [7]. Most of the motor skills that this questionnaire asks about are things that your child does with his or her hands, or when moving [8]. Schoemaker and Wilson (2015) propose that the most optimal early-age screening tool for DCD is a parent or teacher-report questionnaire. They determined that only individuals who spend a great deal of time with a child are able to quantify the effects of motor deficits on everyday activities by comparing them to children with normal rates of

development.[6] Children must rule out the possibility of a physical, medical condition or learning disability.[4] DCDQ'07 has reliability of 0.89; sensitivity is 84.6% and specificity of 70.8% and can be administered from age group of 5 years to 15 years [2].

Planned intervention should take account of personal and environmental factors as well as the burden of disease on participation [9]. Children with developmental coordination disorder typically undergo different types of therapies (e.g., occupational therapy or physical therapy) aimed at improving their motor performance [5].

2. Methodology

This study was approved by institutional ethical committee of Dr. A. P. J. Abdul Kalam College of Physiotherapy. Developmental coordination questionnaire 2007 was converted into Marathi, as parents of children in this rural area were not well acquainted to English language, so for easy convenience this questionnaire was converted into Marathi. 100 children were selected randomly from Ahilyabai Holkar Madhyamik Vidyalaya. Children from age group of 5 years to 15 years were asked to participate in the study. Students fitting into inclusion and exclusion criteria were recruited and their parents were asked to sign informed written consent form. After receiving the informed written consent form, parents were given DCDQ'07. Then filled questionnaire was collected from students and parents scrutinized for its completeness. Database collected was analyzed using Chi Square Test. Once the data was analyzed, the conclusion was drawn.

3. Result

The result indicated that there was 30% of prevalence of indication or suspects of developmental coordination disorder in school going children in Loni and among those participants; boys were having more prevalence for DCD than girls. And the data is not statistically significant, which means prevalence of DCD has no association with the gender.

Table 1: Prevalence of DCD

Age Group	Indication/Suspect for DCD	Probably not DCD
4 years - 6 months to 7 years - 11 months	1	7
8 years - 0 months to 9 years - 11 months	1	5
10 years - 0 months to 15 years - 0 months	28	58
Total	30	70

Result 1- Prevalence of indication or suspect of DCD was 30%.

Table 2: Gender wise distribution

Gender	Indication/Suspect for DCD	Probably not DCD	Total
Male	19	33	52
Female	11	37	48
Total			100

Result 2 – Indication or suspect of DCD was more in males than in females.

Table 3

Gender	Indication/Suspect for DCD	Probably not DCD	Total
Male	19	33	52
Female	11	37	48
Total	30	70	100
Chi - Square test = 2.205 D.F:1			P<0.13

Statistically not Significant

4. Discussion

The main purpose of this study was to determine the percentage of indication or suspects of developmental coordination disorder in school going children in Loni and to study the gender wise distribution of developmental coordination disorder in school going children in Loni.

The present study was conducted on 100 participants of which 52 were boys and 48 were girls. Indication of DCD or suspect DCD was 30% in the age group of 5-15 years. Our study explores the prevalence at each age group and in the boys and girls which earlier studies have not been studied. As seen in the earlier study done by Susan R. Harris PhD PT, Elizabeth C.R. Mickelson BSc(PT) MD, Jill G. Zwicker PhD OT(C) which has higher prevalence which nearly correlates with our study.

These performance differences in males and females can be due low birth weight of child. DCD is common in children born preterm. Low birth weight and postnatal steroid exposure were significant predictors of DCD [9].

The high prevalence of DCD and the higher prevalence among older children and boys become extremely worrying, as this disorder tends to exceed the limit of a problem that is only motor and coordinative, interfering with the overall development.

Another risk factor for DCD may be independent walking at age 15 months or later, difficulties in attention, social communication, and non-word repetition, spelling and reading [5].

The risk of DCD increases with decreasing gestational age. Intrauterine growth restriction is also a strong risk factor, as well as delayed walking.

Young maternal age may also contribute for higher prevalence of DCD among boys than girls.[10]

Higher prevalence of DCD among boys may be due to more boys participates in the study than girls since it was randomized study.

However, despite limitations, it is believed that the efforts employed to conduct studies in large scale may contribute to raising awareness about this disorder and to changing public policies regarding the care of children with DCD.

5. Conclusion

The present study concluded that, there was 30% of prevalence of indication or suspects of developmental coordination disorder in school going children in Loni and among the incidence participants; boys were having more prevalence of DCD than girls.

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