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# Evaluation of IQ in Children with Developmental Coordination Disorder

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**Abstract:- Aim of the study is to find the intelligence quotient in children with developmental coordination disorder. 34 individuals were selected based on the inclusion and exclusion criteria out of which parents of 32 children participated in the study. DCD children were screened using DCDQ'07questionnaire, BOT2 tool, DSM-V diagnostic criteria and the intelligence quotient is evaluated using Malins Intelligence questionnaire for Indian Children. The results were determined by statistical analysis, which shows DCD children do not have any significant IQ changes when compared with their peer group.**

***Keywords:-*** *developmental coordination disorder, intelligence quotient, Malins Scale, BOT2 tool, DSM-V diagnostic criteria, DCDQ'07 questionnaire.*

.

## I. INTRODUCTION

Developmental coordination disorder (DCD) is an old entity that is been described by several terms over centuries to describe the children who were seen with predominant picture of motor difficulties[1]. DCD is defined on the basis of the failure of learning or developing of a skill, habit or a quality by the child when compared to the peer group which includes both gross and fine movements, which is not understood by any impaired learning and they do not get the same opportunity to gain the motor skills which their peers gain[2]. DCD is a developmental problem that is overlooked by the clinicians[3].

Many literatures state that these difficulties will show a considerable impact on the children's lives by producing great struggles in planning and executing[4]. This disorder not only affects the children in school but also in their home activities[5]. They produce a contrast effect to these children when compared to normal children in acquiring the skills with little effort[6]. It is one of the most common childhood developmental disorders[7].

The long term health impact and education problems due to this disorder is not yet understood[8]. Developmental coordination disorder (DCD) is a neurodevelopmental disorder that deficits both the gross and fine motor coordination[9]. This disorder does not accompany any other disorders like severe intellectual or visual impairment, or the motor disabilities like cerebral palsy[10]. It is commonly seen around 5% of the school-aged children[11]. Though it is guessed to be seen in 5% of the school-aged children it seem to be less well understood and very less recognised condition both in medical and educational setting[12].

Intelligence quotient is the measure of the reasoning ability of the person[13]. It is an estimated or determined measure that measures how well a person can use the information and logics to answer the questions that are being asked and to ask questions to others or make any predictions[14]. This test is used to measure short- and long-term memory[15]. This also measures the ability of the person to solve puzzles and to recall the information's that have been heard and how quick they are able to[16].

The intelligence scale has an average of 100, if the person could achieve a score higher than 100, the person is considered to be smarter than the average person, and a score less than 100 indicates the person as less smart than the average person[18].

Intelligence is an inferred process which is used to judge well, to understand, to reason out, to form concepts and to grasp their significance, and to adapt to the adequately new situations in the life[19]. So a person to lead a normal life as such their peer group intelligence is necessary[20].

## II. MATERIAL AND METHODS

- *Study Design:*
  Observational study.

- *Study Setting:*
  - Sri Visa matriculation school
  - Queen mary's nursery and primary school
  - Shree Bhagyalakshmi memorial matriculation school.

- *Sampling Method:*
  Random sampling method

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➢ *Sample Size:*

32 students were selected between the age group of 9-14 years.

➢ *Inclusion Criteria:*

- Subjects age group- 9-14 years.
- Subjects involved both the genders.
- Normotensive.
- without any disabilities, impairment, or handicapped
- Subjects those who are willing to participate.

➢ *Exclusion Criteria:*

- Hypertensive patients.
- Children with any head injuries.
- Mental disorder.
- Other genetic defects.
- Subjects who are not willing to participate.
- Psychological problems.

➢ *Procedure:*

The study was designed as an observational study design, study setting was done at four different schools at Chennai. The number of students screened by (DCDQ0'7) were 750, out of which 34 children were found to be under DCD category, parents of 2 children were not willing to participate. Inclusion criteria included both the gender; children between the age of 9-14 years without any disabilities, impairment, or handicapped. The exclusion criteria included children with any head injuries, mental disorder, and any other genetic defects. The materials required for the study were "developmental coordination disorder questionnaire 2007 (DCD Q 07)", bot-2 tool, Malins intelligence scale for Indian children (MISIC). DCD Children were screened using DCD 07 Q, BOT-2 tool and based on the DSM 5 Criteria. The DCD 07 is a used as a standard tool for screening the children with DCD, it is a valid and reliable questionnaire and the sensitivity and specificity of the questionnaire for the age group 7-17 years is 88.5% and 75.6% respectively, the scores between15 to 57 indicated DCD[21]. This questionnaire consists of 15components which is classified into three different components that included "control during movements" as the first component and the second component as the "fine motor and handwriting" and the finally the third component included "general coordination"[22]. During the procedure of completing the questionnaire, parents were guided by the investigator. Questionnaires that were completely filled were taken into count. BOT 2 tool was used to measure fine motor skills and gross motor skills of the children, DSM-5 diagnostic criteria was used to make a diagnosis of depression for the children. MISIC an intelligence test for children aged 6-15 years 11 months[23]. The MISIC is highly reliable scale and it has a high validity and sensitivity score. The procedure takes about 2-2 and half hours, this test consists of 12 sub tests that are divided into 2 groups that consists of verbal scale which consist of 6 subtests and performance scale that consist of 5 subtests[24]. After the test completion the data were statistically analysed.

## III. RESULT

From the statistical analysis, it has been revealed that there is no significant difference in intelligence quotient of children with and without DCD. The children with DCD does not show any significant changes in their IQ levels.

## IV. DISCUSSION

Missiuna and rivard in their studies they concluded that the children with DCD suffer in expressing their true abilities as they find difficulty in doing their gross motor and fine motor skills which includes the writing works and handwriting[25].

Allloway in his research suggested that they face difficulties in academic activities like reading, memory, and solving problems[26]. DCD is a disorder identified using the motor difficulties faced by the child and which in turn lead the child in various psychosocial problems as they find difficulties in spending their time with their peer group and participations in social activities, this was discussed by Sylvestre in 2013[27]; and Campbell studied about bullying in 2012[28]; and low self- worth and perceived self-competence was discussed by Piek and banynam in 2006[29].

In 2012 Lingam discussed about the relationship between DCD and internalising disorders that include anxiety and low mood[30]. It is believed that this sequelae could lead to poor performance in the school.

Kadesjo and Gillberg in 1999 concluded that the DCD children might have specific learning disabilities, particularly dyslexia that leads the children to a secondary psychosocial consequences[31]. Kaplan and Dewey in their article they disclosed that often in the diagnosis of the DCD there is a combination of two or more developmental and educational milestones[32].

Two researchers reported about the average level of IQ in about 108 countries and provinces[33].

In this research the US countries and the East Asia countries has the average test values within the expected ranges but the African countries have scored around and below 70[34]. Even other researchers have bought into a disrepute that the people in the African countries have a lower IQ average[35].

Earlier the intelligence test was measured by hoe quick the person was able to respond[36]. But a large disputes arose that the speed test does not predict a person's intelligence[37].

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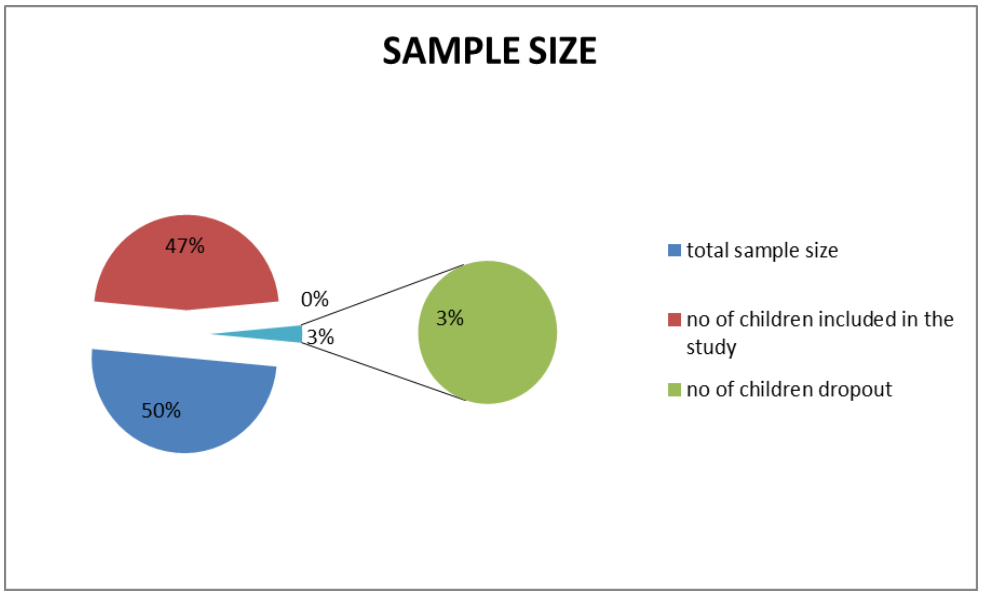


Fig 1

## V. CONCLUSION

From the results, it has been proved statistically that DCD children could complete the task as their peer group. It is found that children with DCD does have any comparative changes in their IQ. The limitation of the current study includes small sample size and minimal duration. Future recommendations include larger sample size, Quality of life of DCD children and the difference between male children and female children can be assessed.

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- *Ethical Clearance: Taken from IEC- INSTITUTIONAL ETHICAL COMMITTEE SAVEETHA UNIVERSITY.*

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