



## Efficacy of the Cognitive Orientation to Daily Occupational Performance in Indian Children with Developmental Coordination Disorder

Ganapathy Sankar U, Monisha R\*

SRM College of Occupational therapy, SRM Institute of Science and technology, SRM Nagar, Kattankulathur, Kanchipuram-603203, Tamil Nadu, India

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### ABSTRACT

Participation restriction in sports and academic activities, which results from difficulties in performing all the activities of daily living in children with DCD. We aim to analyze the effects of cognitive orientation on occupational performance using COOP approach and to examine the transfer skills exhibited by children with DCD. Pre and post test design is adapted in the current study. Total of 8 girls aged 5-10 years were included in the study. Children participated in 12 COOP sessions at least twice a week and a trial session is delivered to all the children participated in the study, in order to gain orientation towards the protocol adapted in the study. COOP measure and performance quality rating scale were used as a outcome measure and in the perspectives of the evaluator all the children had attained a statistically and clinically significant improvement and 5 girls were able to transfer the learnt skill in many tasks which is new. This study adds evidence that COOP approach can be implemented in all the pediatric therapy centers in India.



### \*Corresponding Author

Name: Monisha R  
Phone:  
Email: [monishaphysio186@gmail.com](mailto:monishaphysio186@gmail.com)

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### INTRODUCTION

Children with DCD were poor participants in physical education classes and they experience difficulties in all the activities of daily living and academic skills which require motor skill (Araújo *et al.*, 2019). A child is classified and identified as DCD based on his poor performance in motor skill, when compared to the age matched peers, a child with DCD experiences difficulty in all the ADL skills (American Psychiatric Association, 1994). The prevalence

of DCD is 7-8% (Sankar and Monisha, 2018b). However this prevalence percentage varies based on the geographical location and time frame. The assessment tool which is used to estimate the prevalence percentage is also considered to be the reason for the wide variation (Sankar and Monisha, 2019b). In Kattankulathur, the prevalence of DCD is 6% among children of age group 7-10 years. The prevalence is higher in premature born children and it is more common in boys than girls (Cantell *et al.*, 2008).

Motor difficulties were associated with psychiatric problems, which affects the prognosis of children with DCD and it associate the children with other comorbidities. The major co-occurring problems which a child with DCD experience are anxiety, depression and social negativism. Children with DCD consider themselves as useless and not efficient in performing all the activities of daily living as like the peer group (Sankar and Monisha, 2019c). The task which is easily done by the age matched peer group takes excess practice attempts and learning. They avoid participation in physical and skill based activities. They lack confidence in active play (Ganapathysankar and Saritha, 2011).

Although the term DCD is frequently used in India, but these children were identified and considered formally as DCD without no formal diagnosis and without a gold standard assessment tool. These children were not into a standardized care as they were not exactly diagnosed as DCD. There is no specialized care for a child with DCD. Therefore there is a crucial need for a gold standard assessment tool and specialized interventions for the rehabilitation of a child with DCD (Sankar and Monisha, 2018a). However occupational therapist in India uses sensory integration therapy, motor training strategy to enhance the task orientation and its associated response for a child with DCD. However COOP Approach showed a strong literature evidence, but it is not considered as a first line treatment strategy by the therapist in Indian context.

COOP – cognitive orientation to daily occupational performance is used in the treatment of performance problems of children with DCD. In order to enhance the every days functional performance , COOP – top-down approach can be used.

As COOP is a individualized intervention that focuses on children by using performance analysis to enhance cognitive strategies to improve performance in ADL. Benefits of COOP is, it is short term programme and can be delivered at many settings like home, school and in therapy centers, it can be delivered as individual or group approach. Previous researchers examined the use of COOP approach in 3 children and suggested the need to add the intervention programmes in detail in order to match up the age appropriate task. Researchers insisted the need that parents have to understand the need for the intervention programme and parents need to support for global strategy GOAL-PLAN-DO-CHECK. Thus the aim of the current study is to examine whether Indian children could use global strategies acquired in COOP and to examine their improvement in occupational performance and satisfaction (Cairney *et al.*, 2006).

## MATERIALS AND METHODS

Pre and post test design is adapted in the study to assess the effectiveness of the COOP Approach over occupational performance and satisfaction in children with DCD. The instruments which were used to assess the child at the baseline and over the post treatment session with COOP are developmental coordination disorder questionnaire (DCDQ), Child behavior checklist (CBCL), Wechsler intelligence scale for children, PEGS- perceived efficacy and goal setting system, COPM-Canadian occupational performance measure scoring system, PQRS-

Performance quality rating scale. DCDQ is used to assess whether the child is a suspect of DCD or not. CBCL is filled up by the parents of children with DCD and it examines the child's emotional, behavioral and social problems from parents' perspectives. Instead of diagnosing the child with CBCL, it is used to classify the child into 3 categories, clinical, borderline, and non-clinical. CBCL can also be used to assess the competence . PEGS is used as an interview process that involves various picture and cards that help children to identify the task they consider as difficult and it is used to assign a set of goals to enhance performance in children with DCD. COPM is used to examine the self-perception of performance in ADL, current study employed COPM for both the child and parent. PQRS used the rating from 1- 10 to rate the performance. Motor skill defect has been assessed using MABC but it examines only 3 broad areas, manual dexterity, ball skills and balance. WISC is used to investigate the intelligence level of the child with DCD. By using the baseline evaluation tool, children with DCD of age 5-10 years were included in the study. Any child with neurological impairment were excluded out of the study.

The current study was approved by SRM College of occupational therapy- SRMIST. Written informed consent was collected from all the parents of children with DCD and information sheet which contains the structure of the research methodology was circulated to the parents. 3 researchers participated and collaborated with the current research, as they were blinded and used DCDQ to assess children with possible suspect of DCD. A trained psychologist was also participated in the study and assessment of children was done using WISC-III. A total of 22 children enrolled at the baseline, when the research initiated. After DCDQ assessment 14 were excluded and got referral to other primary health care center. Second researcher who participated and blinded in the study assessed CBCL to screen for children with behavioral problems. Third researcher who is blinded along with our primary researcher interviewed the children with DCD and asked them to make major goals with PEGS and scored their performance using 10 point scale. Mothers helped their children to participate in ADL and helped the children to identify their goals, especially according to the child's choice. They were free to select any extra goal to attain during COOP sessions (Table 1). 2 researchers with minimum 8 years of experience scored PQRS. COOP protocol comprises of 12 sessions, with two sessions using pre test and post test assessments. In COOP approach, parent's participation plays a vital role. COOP contains 12 therapy sessions, 60 minutes each, twice for a week. In COOP,

**Table 1: Children's Characteristics**

Child- Placebo Name	Characteristics	Goals	DCDQ	WISC III	CBCL
A1	Inattention	1. 1. 2. 2. 3. 3.	22	95	30
A2	Perception defecit	1. 1. 2. 2. 3. 3.	40	140	31
A3	Incoordination	1. 1. 2. 2. 3. 3.	25	135	25
A4	Clumsy	1. 1. 2. 2. 3. 3. 4. 4.	35	100	28
A5	Reduced processing speed	1. 1. 2. 2. 3. 3.	45	115	26
A6	Problem with sequencing motor activity	1. 1. 2. 2. 3. 3.	28	132	22
A7	Inattention	1. 1. 2. 2. 3. 3.	29	98	28
A8	Inattention	1. 1. 2. 2. 3. 3.	44	138	25

**Table 2: Coop Rating by Child, Parent and Researcher – Occupational Performance**

Child Name	Child		Parents		Researcher	
	Pre- Test	Post- Test	Pre- Test	Post- Test	Pre- Test	Post- Test
A1	2.5	5.5	2	6	2.6	8
A2	5	5.5	4	6	2	5
A3	2	6	3	7	3	6
A4	5	8	4	9	5	9
A5	6	8	3	6	4	8
A6	3	4	4	8	5	7
A7	2	2.1	2	3	6	6
A8	5	7	2	6	2	4

**Table 3: Coop Rating by Child, Parent and Researcher – Satisfaction**

Child Name	Child		Parents		Researcher	
	Pre- Test	Post- Test	Pre- Test	Post- Test	Pre- Test	Post- Test
A1	2	4	2	7	2	6
A2	3	5	4	6	2	5
A3	2	6	3	8	3	8
A4	5	7	4	7	5	8
A5	6	7	3	5	4	7
A6	3	4	4	8	5	7
A7	2	2	2	4	5	5
A8	5	7	2	6	2	4

child and parents used global strategy and task were simplified by breaking down the task using DPA-Dynamic performance Analyses. Learning skills include feedback processing and demonstration of skills. Assistant clinicians videotaped child’s activity and analyzed PQRS. All the researchers were oriented towards the scoring criteria but they were also blinded towards the sequence of the research. The scores were averaged and values taken up to maximize validity and reliability.

**DATA ANALYSIS**

Analyzes was performed using SPSS software. Pre test and post test scores were compared for each participants with non-parametric test, Wilcoxon test, main outcome measure was COPM scoring system. Second outcome measure includes the motor skill performance.

Childs names were hided and given a placebo numbers for identification. 8 girls and their baseline characteristics were presented in (Table 1). Every girl scored within clinical range on CBCL. Clinical signs reported by the girls with DCD includes anxiety, depression and isolation. When motor skill defect is considered A2, A4, A6,A8 , but 2 children moved to mild coordination defect A1, A5. One child

with DCD came out of all the symptoms A3, One child remains the same A7 (Tables 2 and 3). This small sample size described in the current study can able to interpret the symptoms clinically but unable to obtain and conclude regarding the extensive evidence. When individual pre test and post test data is compared there is a improvement in occupational performance and satisfaction.

This study explores that Indian children, treated with an COOP Approach, showed enhanced occupational performance and satisfaction. This current study used a small sample size, but it highlights the statistically significance obtained for occupational performance among children with DCD. Performance of children in ADL as measured by PQRS attained statistically significant values in this first pilot trial. Further researchers need to document the comparative effectives of COOP treatment to conventional therapy in children with DCD. In 2015, Thornton conducted a research study on COOP and found statistically significant values in COPM. In COOP approach the choice of skills the children was about to select is free and majority of the girls chooses ball throwing and catching (Sankar and Monisha, 2019a). As ball skills were frequently introduced to the children with DCD in schools and

in home. Next skill majority of the girls chosen was handwriting, as the children frequently encounter trouble in academics as it directly related to reduced speed in writing, finger grip, difficulty in sequencing motor skills. But handwriting skill is highly demanding for the children with DCD (Levine et al., 2000). Both children and parents perspectives on satisfaction and improvement in occupational performance following COOP is similar and parents reported that adequate skill training made their children with DCD to allow them to express their thoughts (Steadman-Pare et al., 2001). Every caregiver or mother is allowed to participate in the study and few mothers (Mothers of child A1,A5,A8) have a negative perspectives during the baseline evaluation sessions, but at the end of each sessions with COOP their children showed improved performance in ADL. Further research is needed to evaluate the mother's perspectives and role of caregivers over COOP in rehabilitation of children with DCD.

## CONCLUSIONS

Indian children's with DCD often left undiagnosed as there is no gold standard assessment tool to categorize Indian children as a suspects of DCD. COOP is concluded effective in enhancing performance in children with DCD. There is a need for systematic examination for other therapeutic interventions which can be cost effective.

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## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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