

Exploring Self-Perceptions and Problem Behaviors in Children with Probable Developmental Coordination Disorder with and without Overweight

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ABSTRACT

In the current study, we have documented the problem behavior experienced by children with developmental coordination disorder in their preschool and we have additionally evaluated the reasons for the initiation and persistence of behavioral problems and then evaluated whether sensory processing dysfunction (SPD) and parenting stress were associated with the behavioral problems. Fifty primary school children were included in the study and independent t test was used in examining the group difference among children with and without obesity among developmental coordination disorder children. To analyze the association between sensory processing dysfunction and parenting stress with problem behavior Pearson correlation analysis was used. Results of the current study suggest that primary school children were having more social withdrawal and there is negative correlation found between SPD and problem behaviors. Parenting stress was identified as a major indicator for problem behavior in children with developmental coordination disorder. Understanding the self perception ability and parenting stress with obesity can help occupational therapist and physical therapist to plan intervention programme for children with motor coordination defects.

Keywords: DCD, Problem behavior, Parenting stress, self perception, obesity, Behavior problems.

Introduction

Developmental coordination disorder (DCD) is a motor skill disorder which is characterized by difficulty in jumping and exhibiting any tasks that demand physical coordination. These children

experience delay in walking and difficulty in sitting. Impairments in motor coordination lead to frequent failure in sports and academic tasks. These children isolate themselves from the peer group and family members. They experience difficulty in social interaction as well as restricted patterns of behavior at school and at home¹.

Children with DCD were termed as clumsy and awkward by their parents and majority of the children with motor coordination difficulty were identified at the preliminary stage by their school teachers as teachers spends much time by examining the child's handwriting skill, playing task, peer group interaction and other tasks. They are the one to observe the child's difficulty at the earlier stage and parents even if identified their children struggling to tie shoe lace and button up the shirts, they fail to evaluate the child's motor coordination defects at first².

Children tend to isolate at home and develops problematic behaviors and then the behavioral problems gets exacerbated as the child grows older. Core symptoms seen in children with DCD include poor visual perceptual skill, bilateral coordination, balancing skill, poor handwriting skill and poor motor planning skills. They also experience internalizing or externalizing problem behaviors and this problem behavior will exacerbate the functional difficulties among children with DCD³.

These children consider themselves as poor and incapable to execute functional activities of daily living skills. They tend to compare themselves with the peer group children in green land play. The tasks which the child with DCD learns, relearn and execute with maximum effort is easily accomplished by typically developing children. This has developed a habit of avoidance and activity restriction among children. As the child grows he/she is found to have established psychiatric consequences and problem behavior⁴.

Obesity is the global burden and the parent's inspite of their stress towards the handling the child with DCD, handling the obese child is again adds a greater stress as the child age increases. The association between self perception abilities and problem behavior of obese children with developmental coordination disorder remains unexplored area. The current study explored this possibility. Understanding the self perception ability and problem behaviors among obese children with DCD helps professionals and parents to design suitable interventions¹³.

Methodology

This study was conducted to explore the less researched area in DCD. The self perception ability and problem behavior among obese children with DCD. Children of age group 5 to 10 years were included and the data was collected between January 2020. The institutional ethical committee of SRM medical college hospital and research institute approved this study. Parents were instructed and explained the nature of the research and how the children included in the study were benefitted. Parents gave written consent for their child's active participation in the study. Every child included in the study was delivered their verbal assent.

Total number of children participated in the study is 40 and they were excluded if found to have any other neurological and musculoskeletal disorders. If the child found to have normal BMI but having a suspected DCD were not included in the study. Children were excluded when they found to have missing data on BMI, Motor performance and self perception domains. 40 children included in the study were found to have overweight and obesity. Children were diagnosed and confirmed as DCD based on the DSM-V criteria.

Children were divided randomly in three groups where group A is composed of children with DCD and overweight. Group B is without overweight DCD children and Group C is a control group typically developing children. MABC-2 test is divided and assess three different age bands and it consist of eight items to document the motor performance. Three subsets like manual dexterity, aiming and catching as well as balance. The obtained raw scores were converted into standard score (1–19). If the standard score lies in the range above the 16th percentile, it is regarded as normal and the children have age matched motor skill execution capability. Scores at the range of 6 to 16 were considered at risk on motor performance.

Score less than 6th percentile is indicator for significant motor problems. MABC-2 was used in examining the difference in motor performance. Self perception profile for children was used to examine the perceived athletic competence, physical appearance, self esteem and social acceptance. Each question were answered with choosing a contradictory quotes, kids were good at sports or not good at sports. Then the children were instructed to indicated the selected response in true for them a bit or totally true. Total score range from 6 to 24 points. Raw scores were converted into percentile scores. Child scores \leq 15th percentile were considered having low self perception and if the scores lies at >15 th percentile were considered as having high self-perceptions and the childs BMI was measured with electronic weight scale and their Height was

measured with a centimetre later BMI was then calculated by dividing weight in kilograms over. We evaluated the MABC-2 and BMI in a quiet room by the research assistants.

Results

Descriptive statistics was used for motor performance, self-perceptions, and BMI (Table1). Spearman correlations were used in evaluating the associations between self-perceptions and motor skill execution for children with DCD and TD children (Table 2).

Table 1: Demographic profile of children

characteristics	Children with DCD-overweight	Children with DCD-Normal BMI	Typically developing children
Age	9.0	9.2	9.5
Motor performance	6.1	6.0	12.6
BMI	22.9	16.3	16.2

Table 2: Main effects for groups and gender

Self perception	DCD-Overweight	DCD-Normal BMI	Typically developing children	p
Global self-esteem	18.45	20.23	20.21	.123
Physical appearance	18.23	20.02	20.34	.154
Athletic competence	16.45	17.23	18.25	.004
Social acceptance	16.45	18.25	17.25	.002

Discussions

Social isolation and negative behavior is most frequently reported characteristic among children with motor coordination disorder. Participation in daily activities of living is restricted and as a consequence of it, majority of children were having low level of vitamin D and researchers have documented that avoidance of green land play is the major cause for vitamin D deficiency as these children were not allowed to get exposure to sunrays as they avoid peer group play in green lands⁵.

Majority of the research studies have documented that difference in mental development and physical development in school children and pre-school children were the baseline for development of problem behavior. Previous researchers Davis and Carter in 2008, examined the

problem behavior in children with ASD in preschool and school aged children. Research in developmental coordination disorder is limited and no studies have examined the parental stress, problem behavior and sensory processing dysfunction in children⁶.

The results of the study revealed that older children were more prone for anxious behavior and few children were found to be engaged in self injury and social negativism. But the research documents conducted in the past left with no generalized findings as the participants included in the study were with intellectual, learning disability and developmental disabilities. Sensory processing dysfunction is evaluated in terms of problem in detecting the sensory stimulus and integrating as well as responding trouble to sensory stimulus⁷.

Children with developmental coordination disorder were over responsive and under responsive to sensory stimulus and they exhibit withdrawal response to variety of stimulus. These difficulties hinder the child's developmental problem and inhibit the child's participation in daily living activities. Empirical evidences documents that sensory processing dysfunction accompanies anxiety and other psychiatric illness⁸.

Majority of the researchers examined the relation between sensory processing dysfunction and behavioral problems in children with ASD but research is limited in DCD and the available studies were with lower number of participants and thus having a low statistical power for analysis. Majority of the researchers have focused on the sensory processing dysfunction in children with DCD and concluded that there is no similar trend observed and the pattern of dysfunction varies based on many extrinsic and intrinsic factors and the major disparity was documented by different age group of children with developmental coordination disorder⁹.

To analyze the difference between sensory processing dysfunction and problem behavior in children with developmental coordination disorder, researchers have evaluated different age group children but there is no research comparison on preschool and school age children with DCD. Parenting stress is the underlying cause for problem behavior in children with DCD and due to the stress and discomfort majority of the parents tends to avoid their children and fails to interact with their children¹⁰.

Parenting stress impairs the positive attitude and behavior of the parents and the stress influences the behavior of the parents. They tend to show harsh behavior towards children and there is a lack of wellbeing and warmth. When children with developmental coordination disorder avoids peer group and develops the attitude of isolation, parents were found to be less responsiveness and

found to lack communication with the children and they further risk the child's development and progression¹¹.

Previous researchers have documented that stress experienced by the parents of children with developmental coordination disorder will influence the parenting behavior and that results in harsh behavior towards the child and there is a lack of affection and warmth. They appear to be less affectionate with the child and there is no parent child interaction and bonding. They stop interacting with the DCD child and these negative behaviors from the parents enhance the risk of child's problem. The child might develop anxiety and depression as well as aggressive behavior towards peer group children. The evidence is inconsistent in evaluating the self perception and problem behavior in children with DCD. There is a positive association between obesity and stress¹². There is also a positive association between internalizing and externalizing problem behavior.

Conclusion

To conclude, this study adds knowledge to the self-perceptions in children with DCD. They perceive themselves low in society than the typically developing children. Further research is needed to evaluate if the obesity in children with DCD have an impact on self perception ability. The result of the current study stress the importance for therapists to develop treatment programmes for children with DCD.

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Availability of data and other materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. Please mail and reach us in monisha_ravikumar@srmuniv.edu.in

Ethics approval and consent to participation

The study was approved by the Institutional Ethics Committee (Human Studies) of the SRM Institute of Science and Technology, Kattankulathur with Approval No. 1755/IEC/2019. Written informed consent for interviews was obtained from all participants. The privacy and confidentiality of all the participants was strictly maintained.

Competing interests

Authors declare no conflict of interest

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