Summary of ERIC Projects

Development of an Assessment Tool and Integrated Management Protocol for Children with Development Co-Ordination Disorder

Kavitha Raja*, Ganasan, V.**
Saumen Gupta*** and Srilatha****

Among the plethora of minor childhood disabilities is Development Coordination Disorder (DCD). It is a chronic neurological disorder which starts in childhood and manifests itself as marked impairments in motor coordination, interfering with the participation of the children in their home and academic activities. DCD is believed to affect 5-6 per cent of school-aged children (American Psychiatric Association, 2000) and tends to occur more frequently in boys. DCD can exist on its own or it may be present in a child who also has learning disabilities, speech/language difficulties, and/or attention deficit disorder. Educators and parents who are with the child every day may be the first to notice the difficulties that the child is experiencing. Children with DCD who are not recognised may experience failure and frustration, are often perceived to be lazy or unmotivated, and may develop additional physical, social, and behavioural problems.

The children with DCD require early intervention to help them learn strategies to compensate for their coordination difficulties, to feel better about themselves as individuals, and to prevent developing

* *Professor*, JSS College of Physiotherapy, Mysore, (E-mail: Kavitharaja62@gmail.com).

** *Principal*, Takshshela Junior College, Ujjain (e-mail: tjcujjain456010@yahoo.com).

*** Department of Physiotherapy, Sikkim Manipal Institute of Medical Sciences, Gangtok (E-mail: Saumengupta@gmail.com).

**** *Research Scholar*, Department of Physiotherapy, School of Allied Health Sciences, Manipal University, Manipal (E-mail: lathanayak_22@yahoo.co.in)

other secondary issues. Intervention for children with DCD may include referral to an occupational therapist or physiotherapist. An occupational therapist and/or physical therapist may help the child learn to perform daily tasks more successfully and will make recommendations to parents and educators regarding the participation of children with DCD at home, in the classroom, on the playground, and in leisure activities in the community. The, present study aimed to develop an assessment tool and management strategy for DCD in the school context along with the DCD questionnaire, which is a parent-report screening tool that asks parents to compare their child's performance in everyday tasks with that of their typically developing peers. The revised DCDQ'07 can be completed by parents of children aged 5 to 15 years (Wilson et al. 2009).

Objectives of the Study

As the study was conducted in two parts, phase-wise objectives are given below.

Phase I objectives-

- Development of tool to diagnose low motor proficiency
- Validation with existing tools.
- Reliability testing.

Phase II Objectives

- Development of a management strategy that will embed into the existing academic framework to integrate children with DCD into the mainstream.
- Effectiveness of the programme as indicated by improvement on the DCD tool as well as changes in academic performance.

Method

Using a 3 round Delphi process, items were generated for the tool within each of the domains identified from literature that exhibit a deficit in children with DCD. Likewise, scoring criteria were formed and the tool was tested on 60 children initially and items removed and scoring criteria formalised. Thereafter, the tool was tested on 127 children and domains were identified and items reduced with Rasch analysis using Winsteps. The final tool has 20 items comprising of 3 constructs, and a short version comprising 12 items. These constructs are related to manipulation, motor diversity, and sensory motor coordination. Some of the items on the

tool included- cutting a figure, hopscotch with a cube, storytelling, reading a familiar paragraph etc.

This final tool was tested for test retest reliability to assess its stability (r=0.79). Using the tool, children with possible DCD were identified. These children were given a remediation programme that was embedded in the school curriculum.

The following guidelines were given for the intervention strategy:

- Manual dexterity: change the writing instrument so as to enable penmanship which requires less pressure on the paper.
- Introduce craft work as per the child's interest that involves use of instruments, fine motor activity and in hand manipulation.
- Engage the child in play activities that require motor control and balance and cognitive processes like obstacle clearance, hurdles etc.

After the intervention was given for six weeks, children were retested. There was no measurable improvement in academic performance, as the duration may have been inadequate. Teachers were interviewed regarding their opinion on the feasibility of incorporating the testing and intervention in the school curriculum. Teachers commented that testing was time consuming and required special skills. But the intervention was easy to embed in the school curriculum. The tool items were validated against items on an existing tool of motor proficiency viz. Movement Assessment Battery for Children (MABC) and were found to be valid (r=0.55-0.9).

Limitations and Strengths

The developed tool has validity against existing tools of motor proficiency. Excellent correlations are not expected as existing tools are not specific to DCD. The final items on the tool are easy to replicate and can be completed in 30 minutes including instruction and setting up.

Despite the fact that the tool developed in present study is based on rigorous research in prescribed manner for tool development and adheres to theoretical constructs of DCD, the intervention period was not sufficient to effect changes in academic performance. Thus, further work must be done to decide on the optimum duration of intervention to bring about measurable changes in children with DCD with the embedded programme. To add another dimension to the tool, normative timings for urban and rural children separately must be calculated.

Conclusion

This study met its objectives and the tool Assessment Battery for Children with Co-ordination Disorder is a valid and reliable tool to assess the capacity component of DCD. To improve its effectiveness it must be used in conjunction with Development Co-ordination Disorder Questionnaire (DCDQ) to identify children with DCD.

Reference

Wilson, B.N., S.G. Crawford, D. Green, G. Roberts, A. Aylott and B.J. Kaplan. 2009. Psychometric Properties of the Revised Developmental Coordination Disorder Questionnaire. *Physiological Occupational Therapy Paediatrics*. 29(2). pp. 182-202.