

Identifying Developmental Dyscalculia: Perspective of Primary School Teachers

Nandini Jayachandran, Immanuel Thomas, & Lekshmi, K.
Institute for Communicative & Cognitive Neurosciences, Trivandrum

Developmental Dyscalculia (DD) is a topic of much concern, as Mathematics is a subject that has much applicability in our daily life and which in turn limits educational attainment and affects the income level of a person. Studies indicate that early identification and remediation can overcome DD to a large extent. One way to ensure early identification of DD is to make sure that teachers in the general education stream have adequate knowledge about the condition and have the necessary skills for the identification of these children. The present study aims to understand the primary school teacher's knowledge about DD, the possibility of additional assistance given to these children and its effectiveness by employing a Focus Group Discussion. The results evolved indicated that teachers are aware of the difficulties faced by these children and the remediations they employ are effective to a certain extent.

Keywords: Developmental Dyscalculia, Focus Group Discussion, Identification

Developmental Dyscalculia is a dysfunction of developing neural networks specifically in the numerical domain due to a variety of possible reasons, including genetic vulnerability, deficits in domain-general abilities like visuo-spatial and verbal processing, attention, and working memory, and adverse environmental and psychological conditions like deprivation and anxiety (von Aster & Shalev, 2007). This condition is characterized by persistent difficulties in learning and remembering arithmetic facts (Geary & Hoard, 2001; Ginsburg, 1997; Jordan & Montani, 1997; Jordan, Kaplan & Hanich, 2002), executing calculation procedures (Russell & Ginsberg, 1984), immature problem solving procedures (Geary, 1990; Geary, Bow-Thomas & Yao, 1992) memory retrieval deficits (Barrouillet, Fayol & Lathulie`re, 1997; Geary, 1990; Geary, Hamson & Hoard, 2000) and poor performance in tasks requiring an understanding of basic numerical processing (Landerl, Bevan & Butterworth, 2004; Butterworth, 1999).

Developmental Dyscalculia can be distinguished from other causes of low numeracy by the presence of more fundamental problems in the understanding of simple number concepts such as poor counting or selecting the larger of two numbers (Landerl, Bevan & Butterworth

(2004) and an inability to subitize (an ability that underpins the acquisition of counting skills). This suggests that Developmental Dyscalculia is due to a highly specific impairment in the capacity to learn arithmetic (Butterworth, 2005). Akin to the phonological deficit hypothesis of dyslexia, the core deficit in the numerical system is "the number sense" deficit which is the ability to quickly understand, approximate and manipulate numerical quantities, as proposed by Dehaene (2001). Its neural substrate is the Horizontal Intra-Parietal Sulcus (HIPS), a specific region of the parietal cortex which contains a non-verbal representation of numerical quantity analogous to a mental number line (Dehaene, Piazza, Pinel & Cohen, 2003). The condition is found to be quite enduring, often persisting into late adolescence (Shalev, Manor & Gross-Tsur, 2005).

Developmental Dyscalculia can be established in standard III, that is at the age of 8-9 years (Fuchs et al., 2011); but its identifiable features may manifest itself even earlier (Fuchs & Fuchs, 2001; Fuchs et al., 2005; Geary, 2005) as early as 5-7 years. It has an estimated prevalence rate ranging from 5-6.5% of school going population (Geary & Hoard, 2001; Gross-Tsur, Manor & Shalev, 1996; von Aster &