

Physiotherapy Intervention on Balance, Motor Skills, and Functional Movement in Children with Developmental Coordination Disorder: A Scoping Review

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ABSTRACT

Developmental Coordination Disorder (DCD), prevalent in roughly 6% of primary school children, poses significant challenges to motor development. This common disorder manifests as difficulties with balance, coordination, and postural control, hindering the acquisition of essential gross motor skills. Consequently, children with DCD often exhibit reduced physical fitness, strength, and stamina, and may display passivity and inactivity. This study aims to review and condense existing research on physiotherapy treatments that enhance balance, posture, strength, and gross motor skills in children with DCD. A literature search was conducted across PubMed and Google Scholar databases for the period 2014–2024. The search utilised keywords such as “Children,” “Neuromuscular Training,” “Strength Training,” and “Developmental Coordination Disorder,” combined with Boolean operators AND and OR. Only studies investigating strength training or neuromuscular training as interventions in children with DCD, with measurable treatment outcomes, were included in the analysis. Non-English articles were excluded. Of the 18,521 articles initially identified, only six met the inclusion criteria. The reviewed literature primarily assessed balance, postural control, and strength using various tools, including

balance tests for static and dynamic stability, sway energy scores, computerised dynamic postural assessments, and dynamometers. Some studies compared children with DCD to typically developing children using the Movement Assessment Battery for Children. Combined Hems Ball Training showed statistically significant improvements ($p < 0.05$) in balance and postural control, while Functional Movement Power Training (FMPT) proved superior to Functional Movement Training alone for strength and postural control. One study found no significant difference between experimental and control groups with neuromuscular training. Additionally, the timing of gastrocnemius muscle activation and reduced motor unit firing variability in DCD children were identified as key factors affecting performance. Limited studies indicate that Combined Hems Ball Training and FMPT significantly improve balance, postural control, and strength in children with DCD. However, further high-quality trials are needed to provide more conclusive evidence. Furthermore, recognising the crucial role of muscle activation timing and motor unit variability in children with DCD underscores the need for targeted approaches for intervention planning.

Keywords: Child, Motor skills disorders, Postural balance, Resistance training.