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Comparison of Gait Parameters in Typically Developing Children with Down Syndrome Children: A Literature Review

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ABSTRACT

Introduction: Down syndrome is a nonhereditary genetic condition, characterized by an extra abnormal chromosome set which is placed on the 21st chromosome and so it is also called trisomy 21 due to one extra chromosome which makes 47 chromosomes in total instead of normal 46. All the Down syndrome children may show some degree of motor delay, postural issues, gait impairment, balance issue, sensory and cognition impairment on the basis of their severity level. Due to generalized hypotonia and flaccid posture which is the major characteristics of Down syndrome condition, children often seen with delay in walking, abnormal gait patterns specially at spatiotemporal area. When compared with typically developing children, it has been noticed that some difference is seen in stride length, step length, cadence and base width which may vary on severity of the condition of particular individual.

Aim and Relevance: The purpose of this review is to provide a vision into how Down syndrome children have different gait patterns for spatiotemporal area in age-matched typically developed children.

Material & Methodology: This literature includes those studies involving gait analysis on Down syndrome children and typical children for comparison purpose.

Inclusion Criteria: Primarily 30 articles were retrieved on the basis of topic gait in typically and down syndrome children from Google Scholar, education Source, and PubMed were the primary medical databases for this review. We shortlisted 15 studies after using keywords like “Down syndrome, gait, spatiotemporal, cadence, stride length” used one & alternatively.

Result: Typically developed children and Down syndrome children have different gait patterns. When gait of Down syndrome children compared with typically developing children, it has been observed that stride length and step length in Down syndrome children found to be 65-75cm (centimetre) and 30-40cm subsequently, velocity around 0.6-0.8 m/sec which is much lesser than in typical children. Cadence found to be approximate 120 steps/min and base width around 10-14cm which is much larger when compared to age-matched typically developing children.

Conclusion: Down Syndrome children have different and unique gait patterns because of their physiology of the body structure and so this type of study for therapeutic intervention is needed to examine and work with the children with Down syndrome to obtain objective data to implicate in therapy to get better balance and improve gait patterns.

Keywords: Down syndrome, gait, spatiotemporal, cadence, stride length

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