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Test-retest Reliability of the 360° Turn Test in School going Children with Different BMI

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Suraya Niyaz, Postgraduate Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, MM (DU), Mullana, Ambala, Haryana, India.
Riya Kalra, Postgraduate Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, MM (DU), Mullana, Ambala, Haryana, India.
Kanu Goyal, Assistant Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, MM (DU), Mullana, Ambala, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kanu Goyal,

Assistant Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, MM (DU), Mullana, Ambala, Haryana, India.

E-mail: goyalkanu02@gmail.com

ABSTRACT

Introduction: Dynamic balance is an important component of motor performance, plays a vital role in the physical activity and functional mobility of children. The 360-degree Turn Test (360DTT) is a reliable measure for assessing dynamic balance. This study investigates the test-retest reliability of the 360DTT in school-going children aged 6–17 years with varying Body Mass Index (BMI). The rising prevalence of childhood obesity underscores the importance of assessing balance to mitigate the associated risks of physical inactivity and motor deficits.

Aim: To estimate the test-retest reliability of the 360DTT and examine its influence on BMI on dynamic balance in children.

Materials and Methods: This cross-sectional observational study recruited 153 children (51 in each BMI group) from a school. Demographic data, including age, height, weight, and BMI, were measured. Participants performed the 360DTT in a controlled environment, and the test was repeated after 48 hours. The time taken to complete the test in clockwise and counterclockwise directions was measured using a stopwatch. Test-retest reliability was assessed using Cronbach's alpha, Intraclass Correlation Coefficient (ICC), Standard Error of Measurement (SEM), and Minimum Detectable Change (MDC 95%).

Results: The normal and obese groups demonstrated excellent test-retest reliability (Cronbach's alpha ≥0.89, ICC ≥0.89), while the overweight group showed moderate reliability (Cronbach's alpha =0.71, ICC=0.71). Measurement errors (SEM: 0.70–0.92) and MDC95% (1.94–2.55) were minimal across all groups. Performance times were consistent, with mean differences between trials remaining statistically insignificant (p=0.001). Children with higher BMI displayed slower test performance, indicating potential balance impairments.

Conclusion: The 360DTT exhibits high reliability for assessing dynamic balance in school-going children, particularly in normal and obese groups. Overweight children showed moderate reliability . The test's ease of use and reliability make it a valuable tool for evaluating balance and guiding interventions to improve motor performance, particularly in children with obesity-related challenges.

Keywords: Childhood obesity, Dynamic balance, Motor performance.