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Reference Values of Mass Grasp, TOE-to-examiner's Finger and Alternate Heel-to-knee; Heel-to-toe Test among Young Adults

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ABSTRACT

Introduction: Coordination refers to the mechanism by which the brain and body work together to produce controlled and purposeful movements. This process involves This process involves the integration of sensory information—such as visual, auditory, and proprioceptive inputs—with motor functions to effectively perform tasks. It includes both gross and fine motor skills, as well as motor planning. Coordination can be evaluated through both non-equilibrium and equilibrium coordination tests.

Aim: This study aimed to determine the reference values for the mass grasp test, toe-to-examiner's finger test, alternate heel-to-knee test, and heel-to-toe test among healthy young adults aged 18 to 25 years.

Materials and Methods: The study recruited 466 participants aged 18 to 25 years through convenience sampling, ensuring that individuals met predetermined eligibility criteria. The sample comprised an equal gender distribution. Each participant was instructed to perform three specific motor tests; the mass grasp test, toe-to-examiner's finger test, and the alternate heel-to-knee; heel-to-toe tests. Participants completed three trials for each test. The readings for both the right and left limbs were recorded in each trial by using a mobile based stopwatch. The tests were administered in a consistent order to minimise variability.Ethical approval was obtained from the MMIMSR (Maharishi Markandeshwar Institute of Medical Sciences and Research) Mullana, Ambala, with the ethical number IEC-2672.

Results: Age, height, weight and Body Mass Index (BMI) of recruited young adults were 21.61+2.02 years, 165.43+9.16 cm, 61.00+10.60 kg, and 22.25+2.83 kg/m^2, respectively. The reference values obtained for the mass grasp test were (0.28±0.073) milliseconds for the right limb and (0.27±0.70) milliseconds for the left limb. For the toe-to-examiner's finger test, the values were (0.96±0.20) milliseconds for the right limb and (0.94±0.20) seconds for the left limb. For alternate heel-to-knee and heel-to-toe tests were (1.94±0.51) milliseconds for the right limb and (1.92±0.52) milliseconds for the left limb, respectively.

Conclusion: Reference values for the mass grasp test, toe-to-examiner's finger test, and alternate heel-to-knee and heel-to-toe tests in young adults aged 18 to 25 years have been established.

Keywords: Coordination, Motor skills, Sensory information.