

Validity of the paper grip test to assess muscle strength in people with Type 2 diabetes

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Aims: The paper grip test was developed as a screening tool for muscle weakness in people with leprosy and previous research has been found it to be accurate in detecting muscle weakness in people without diabetes. This study investigated the validity of the paper grip test as a clinical tool for assessing plantar flexion strength of the hallux in people with Type 2 diabetes. **Methods:** 66 people (25 females and 41 males) with Type 2 diabetes and neuropathy (vibration perception threshold ≥ 25 Volts) were recruited from and tested at an Indian hospital (mean \pm SD: age 59 ± 8 years, duration of diabetes 13 ± 7 years). Plantar flexion strength of the hallux was measured simultaneously using the paper grip test (clinical assessment) and a plantar pressure platform (biomechanical assessment). Participants were divided into two groups: one group consisting of the 35 participants who passed the paper grip test and the second of the 31 participants who failed. An independent sample t-test was conducted to determine if a significant difference in peak force measured at the hallux during the paper grip test was evident between the groups. **Results:** Participants who passed the paper grip test for the hallux demonstrated significantly greater peak force at the hallux (33.55 ± 18.13 N vs. 19.49 ± 8.28 N; $t(64) = 3.97$, $p < 0.001$) than those who failed. **Conclusions:** In the population examined the paper grip test was found to be a valid clinical tool for assessing plantar flexion strength of the hallux.