

Is it possible to assess more pinches?

Roldão, E.¹, Gil Pascoal, A.²

¹Department of Health Sciences, School of Health Sciences, Polytechnic Institute of Leiria, Portugal, elisabete.roldao@ipleiria.pt

²Faculty of Human Kinetics – Lisbon University, Portugal, gpascoal@fmh.ulisboa.pt

ABSTRACT

BACKGROUND: The pinch strength and its function assessment is fundamental in the rehabilitation process on hand dysfunctions. The evaluation of pinch strength is a global measure of the capacity to grab a small object^[1]. The current standardized assessment of the pinch considers three configurations: the tip to tip, the key and the tripod. The relation of this assessment and the difficulties in performing the Activities of Daily Life (ADL), that uses these pinch's is inexistent^[2]. The pinch configurations were recently classified in a new taxonomy sponsored by the European Commission^[3]. They were organized regarding their previous classifications, in other taxonomies, their number of strength vectors, type of contact with the fingers, strength and thumb position^[3]. **OBJECTIVES:** The main objective of this works is to verify if it's possible to assess the pinch strength of the configurations, of this taxonomy, on the Biometrics E-Link[®] Pinchmeter. **METHODS:** This experimental study analyzed the pinch configurations compatible with the using of the Pinchmeter, and establish a specific evaluation protocol, maintaining the American Society of Hand Therapists protocol assessment. We used a caliper to measure the diameter of the Pinchmeter. We cross the results with the characteristics of the pinches, regarding the diameter, and there were identified five configurations, that can be applied in the Pinchmeter. In a second phase of the study were verified the possibility to apply this new pinch configurations assessment in 46 participants without and with neuromusculoskeletal hand pathology. We also collect data regarding the difficulties in performing ADL, through a checklist of pinch tasks, built by the authors and experts using a Delphi Panel. **RESULTS:** We verified that the strength behavior was identical in participants with and without hand pathology and the difference between their strength was significative. The statistical analysis confirms the possibility to access new pinch configurations. The 23 participants with hand pathology identified the ADL tasks, that were difficult to perform. We verify that with more lack of strength more difficulties in performing tasks. This way we can relate difficulties in the performance of the ADL tasks that uses the pinches, with the lack of pinch strength. **CONCLUSIONS:** The assessment of the pinch strength can be related to the functional performance of

ADL, giving a new perspective of the pinch function. We develop an access protocol for these pinches and it is not yet validated. This would be very useful for the clinical professionals working with ADL.

Keywords: *Pinch, Strength, Assessment*

References:

- [1] Victoria A, Mcquiddy Carol R, Scheerer C, Ryan Lavalley & Tomothy McGrath. Normative Values for Grip and Pinch Strength for 6- to 19- Years-Old. Archives of Physical Medicin and Rehabilitation. 2015; 96: 1627-33.
- [2] Simard J, Chalifoux M, Fortin V, Archambault MJ, St-Cerny-Gosselin A & Desrosiers J. Could Questions on Activities of Daily Living Estimate Grip Strength of Older Adults Living Independently in the Community? Journal of Aging Researc. 2012; (1-6).
- [3] Feix T, Romero J, Schmiedmayer & Kragic D. The grasp taxonomy of human grasp types. Ieee transactions on human-machine systems. 2016; 46(1): 66-12.