

## Automation of Measurements for Digital Posturography in a Standing Position: Software EPPA!

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### Abstract

This paper introduces the development of the EPPA! Software, with its Spanish acronym, "Evaluación Posturográfica de Pie Automatizada," created using Matlab R2019a from Mathworks®.

EPPA! serves the following purposes:

- a) To facilitate the objective evaluation of posture in a standing position through the standardization of 55 (fifty-five) variables (linear ( $\pm 1$ cm) and angular ( $\pm 2^\circ$ )), linked to anatomical indicators in digital posturographs in the standing position.
- b) To provide access to intersegmental postural diagnoses based on regions, planes, and views, with respect to ideal reference lines and normality ranges.
- c) To enable additional measurements of the evaluator's choice, beyond the standardized ones, tailored to the clinical case and the significance of specific anatomical regions or singularities of interest.

To validate the software, a comparison with the open-source software Kinovea © 0.9.5 was conducted using a pilot sample ( $n = 6$ ) of older adult volunteers of both genders, who were referred for postural treatment due to diagnoses of orthopedic and/or traumatological musculoskeletal conditions. This study excluded individuals with neurological pathologies affecting motor control. The comparison was carried out by healthcare professionals with expertise in posturographic assessment. We found significant differences in the results of this comparison, with the Two One-Side Test (TOST) based on the normality of variable (linear and angular) in paired samples ( $p < 0.05$ ).

**Keywords:** Human posture, Postural Evaluation, Posturography, Software design, Physical Therapy.