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Short communication

## O 066 - correlation of the foot profile score and gait profile score

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## 1. Introduction

The Gait Profile Score (GPS) is a single measurement calculated as the average root mean square difference between a patient's data and normative data for the lower limb kinematic variables [1]. The Foot Profile Score (FPS) is a measure analogous to the GPS, but based on the Oxford Foot Model kinematics [2].

## 2. Research question

The aim of this study is to investigate the relationship between the FPS and GPS to evaluate to what extent the FPS is additionally informative.

## 3. Methods

Lower limb and Oxford Foot Model kinematics were collected using a 16 camera system (Vicon Motion Systems Ltd.). The GPS and FPS were calculated in 60 subjects with global involvement and in 60 subjects with clubfoot. The global involvement (GI) group consisted of 30 children/ 30 adults with varying diagnoses including cerebral palsy, orthopaedic, and neurological conditions. We used right leg data in 31 subjects and there were 36 males. The clubfoot group consisted of children aged 5–16 (mean 10 years), with 45 males and 39 right legs analysed. The Spearman Rank Correlation was used to analyse the relationship between the FPS and the GPS for both groups.

## 4. Results

The GI group had a GPS mean of 8.3 (SD 2.9) and a FPS mean of 8.3 (SD 2.5) indicating that at group level both distal and proximal joints contributed to gait abnormalities. The clubfoot group had a mean GPS of 5.7 (SD 1.3) and a mean FPS of 7.1 (SD 2.1) indicating foot specific problems in this group. The correlation between the GPS and FPS in the GI group was significant at 0.67 with  $p < 0.01$  (Fig. 1). The correlation between the GPS and FPS in the clubfoot group was much lower at 0.37 with  $p < 0.01$  (Fig. 2).

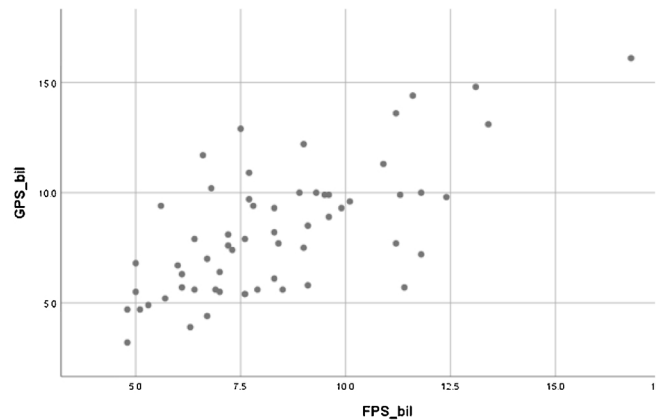


Fig. 1. Global involvement group FPS/GPS correlation.

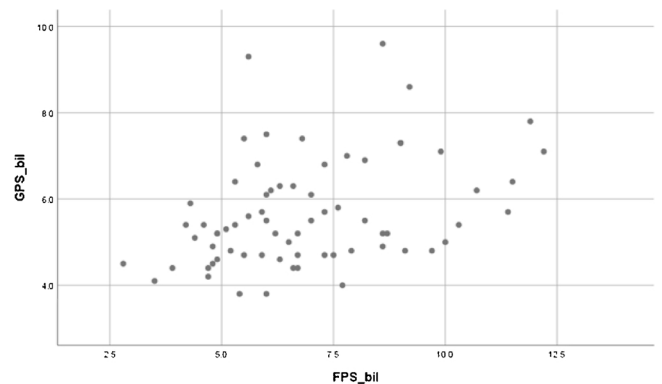


Fig. 2. Clubfoot group FPS/GPS correlation.

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## 5. Discussion

As expected, there was a different relationship between the GPS and FPS in the clubfoot compared to GI group. The GPS only uses a single rigid line to represent the foot, so may not always fully capture the extent of the effect of foot deformity on gait. In addition, some populations have an isolated foot problem, with little effect on proximal joints. This may produce a relatively low GPS, meaning the GPS may not always be appropriately sensitive for these populations. The difference in correlations between these groups indicates that the FPS is

able to represent gait deviations not reflected by the GPS in populations where foot deformity is dominant. The FPS gives additional information, especially in subjects with foot specific deformity and should be presented alongside the GPS to gain a better understanding of the quality of an individual's gait pattern.

## References

- [1] R. Baker, et al., *Gait Posture* 30 (2009) 265–269.
- [2] J. Stebbins, et al., *Gait Posture* 23 (4) (2006) 401–410.