controls (CG) (age = 35.20 ± 6.23 years; BMI = 22.25 ± 1.97 kg/m$^2$) and 10 haemophilic patients (HG) (age = 36.80 ± 10.49 years; BMI = 27.94 ± 7.36 kg/m$^2$) with different grade of elbow arthropathy (HJHS average in elbows = 10.20 ± 9.11) participated. Microsoft Kinect V2 (MKV2) depth camera and goniometer were used to measure the elbow ROM from the maximum extension to the maximum flexion in increments of 10°. To improve MKV2 accuracy, a measurement correction model (cubic polynomial fit) was applied. MKV2 validity was assessed comparing MKV2 and goniometer measurements using the Bland-Altman method. Differences in the ROM between CG and HG were analysed with Wilcoxon test.

**Results**: Before adjustment, the mean error of the MKV2 with respect to the goniometer was 7.87° (limits of agreement (LoA) = −10.28°;26.02°) in the CG and 9.49° (LoA = −7.92°;26.89°) in the HG. After applying the fitting model, the mean error was reduced to −0.08° (LoA = −8.10°; 7.93°) in the CG and to −0.73° (LoA = −10.70°; 9.25°) in the HG. This reduction of the error was statistically significant ($P < .001$). Regarding the ROM, the HG showed a significantly ($P < .001$) lower extension and flexion of the elbow than the CG, both with the goniometer and with the MKV2 measurements. There were no statistically significant differences between measurements performed with the goniometer and with MKV2, except for the extension in the HG ($P = .008$).

**Conclusions**: Results indicate that the angle-corrected MKV2 is a valid tool to measure elbow ROM of haemophilic patients. Therefore, this telemedicine tool, in addition to its gaming use, can complement classical goniometry allowing the clinicians to remotely measure the patients' ROM, especially post bleeding, when an accurate control of a therapeutic program is needed. Moreover, MKV2 can reduce patients' hospital dependence.

## T-P-147 (216) | Interaction of dual task in haemophiliac and non-haemophiliac subjects in postural control during quiet stance

Carlos Cruz-Montecinos[1,2]; Felipe Querol[2,3]; Joaquin Calatayud[3]; Juan J Carrasco[3]; Veronica Soto[4]; Sofia Pérez-Alenda[2,3]

[1]*Department of Physical Therapy, University of Chile, Santiago, Chile;* [2]*Haemostasis and Thrombosis Unit, University and Polytechnic Hospital La Fe, Valencia, Spain;* [3]*Department of Physiotherapy, University of Valencia, Valencia, Spain;* [4]*Haemophilia and Inherited Bleeding Disorder Treatment Center, Roberto del Río Hospital, Santiago, Chile*

**Introduction**: The most common consequences of haemophilia are joint damages, principally the lower limb (knee and ankle) affecting range of motion, force and proprioception. Recently, it has been proposed that haemophilic arthropathy is accompanied with poor automatic postural control strategies. One form to study the automated process in postural control is the dual task paradigm. The main objective of this study is to probe the following hypothesis: haemophilic patient have less automatic postural control during cognitive dual task.

**Methods**: Eighteen adult patients with severe haemophilic and fifteen non-haemophilic patients were assessed. Each participant was invited to maintain a quiet stance during 30 seconds three times with deprivation of visual stimulus in single task (maintain bipodal posture) and cognitive dual task (bipodal posture and mathematical task). The postural sway was assessed by triaxial accelerometer at L5. The sway analysis consisted in measure two variables, the acceleration of center of mass and irregularity of acceleration signal through sample entropy to assess the automatic process of postural control. The two-way ANOVA was applied by group (haemophiliac and non-haemophiliac) and conditions factors (close eyes and dual task). If interaction was significant the par-comparison was applied with Bonferroni post-hoc.

**Results**: The two-way ANOVA showed a significant interaction in sample entropy between group and conditions only in mediolateral axis ($P = .038$). Also, we found a significant difference in the factor group ($P < .001$) and conditions ($P = .008$). The post-hoc analysis exhibited a higher sample entropy during dual-task in non-haemophilic group ($P = .006$), however in haemophiliac patients the sample entropy was maintained without change between conditions ($P = .900$).

**Conclusion**: The results suggest that haemophiliac patients has lees automatic control in the dual task condition during quiet stance. The poor automatic adaptation during dual task propose that is necessary postural exercise to optimize the automatic adjustments during different physical and cognitive conditions.

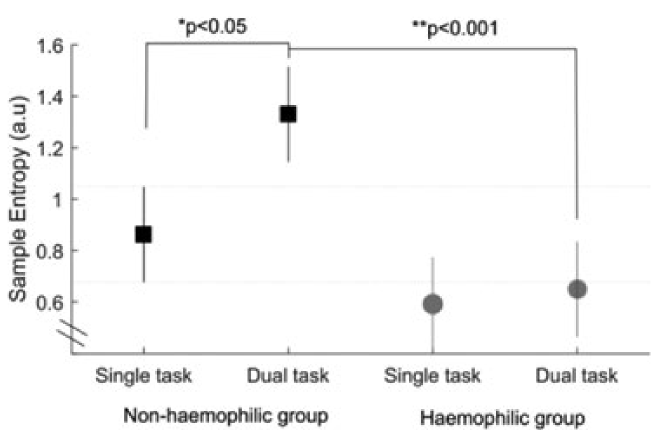


**FIGURE 1.** Interaction of group and conditions during quiet stance.