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PARAMETERISATION AND RELIABILITY OF THE FUNCTIONAL REACH TEST IN PEOPLE WHO SUFFER STROKEMerchán-Baeza JA¹, González-Sánchez M¹, Cuesta-Vargas AI^{1,2}¹Department of Physiotherapy, University of Malaga, Malaga, Spain²School of Clinical Sciences of the Faculty of Health at the Queensland University of Technology, Brisbane, Australia
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AIM: The aim of this study is to analyse the reliability, sensitivity and specificity of the parameterisation of FRT using inertial sensors to record kinematic variables in subjects who have had a stroke. Our hypothesis is that the IS will be reliable instruments for kinematic study of the FRT.

METHODS: This is a cross-sectional study of 5 subjects over 65 years who suffer of stroke. During the execution of Funtional Reach Test the subjects carried two inertial sensors, one was placed in the lumbar and the other in the trunk. After analysing the data obtained in the kinematic registration by inertial sensors a number of direct and indirect variables were obtained. The variables extracted directly from FRT through the IS were distance, maximum angular lumbosacral/thoracic displacement, time maximum angular lumbosacral/thoracic displacement, time return starting position and total time. Using this data the speed and the acceleration of each one of them were calculated. A descriptive analysis of all kinematic outcomes recorded by the two inertial sensors was developed (trunk and lumbar) and the average range achieved in the FRT. Reliability measures were calculated by analysing the internal consistency the measures with 95% confidence interval of each outcome variable. The reliability was calculated in the functional reach and the outcomes measured by the IS.

RESULTS: The values in the the Functional Reach Test obtained in the present study ($2.06 \pm 12.75\text{cm}$) are similar to those obtained in other studies with this population and in the same age range. Intrasubject reliability values observed in the use of inertial sensors are all located above 0.820, ranging from 0.829 (time B_C lumbar area) and 0.891 (A_B displacement of the trunk). Likewise, the observed intersubject values range from 0.821 (Time B_C lumbar area) and 0.883 (B_C trunk displacement). On the other hand, the reliability of the FRT was 0.987 (0.983-0.992) and 0.983 (0.979-0.989) intersubject and intrasubject respectively.

CONCLUSION: The main conclusion that can be reached is that the inertial sensors are a tool with excellent reliability, validity, sensitivity and specificity in the parameterisation of the Functional Reach Test in people who have had a stroke.

Table 4: Intra-observer and inter-observer reliability of variables measured directly during functional reach test.

| Variable | | | INTRA-OBSERVER | | | INTER-OBSERVER | | |
|-----------------------|-------|-----|----------------|----------|-------|----------------|----------|-------|
| | | | ICC | IC (95%) | | ICC | IC (95%) | |
| | | | | Min. | Max. | | Min | Max |
| Trunk | Time | A_B | 0.855 | 0.833 | 0.872 | 0.851 | 0.828 | 0.869 |
| | | B_C | 0.835 | 0.822 | 0.852 | 0.831 | 0.824 | 0.848 |
| | | A_C | 0.847 | 0.839 | 0.868 | 0.840 | 0.839 | 0.868 |
| | Displ | A_B | 0.891 | 0.879 | 0.913 | 0.883 | 0.877 | 0.913 |
| | | B_C | 0.863 | 0.843 | 0.878 | 0.858 | 0.845 | 0.871 |
| | | A_C | 0.877 | 0.861 | 0.895 | 0.870 | 0.859 | 0.888 |
| Lumbar | Time | A_B | 0.867 | 0.844 | 0.880 | 0.858 | 0.841 | 0.879 |
| | | B_C | 0.829 | 0.806 | 0.855 | 0.821 | 0.804 | 0.852 |
| | | A_C | 0.851 | 0.837 | 0.869 | 0.839 | 0.832 | 0.860 |
| | Displ | A_B | 0.878 | 0.850 | 0.896 | 0.875 | 0.852 | 0.893 |
| | | B_C | 0.868 | 0.849 | 0.883 | 0.863 | 0.846 | 0.870 |
| | | A_C | 0.872 | 0.853 | 0.889 | 0.868 | 0.850 | 0.877 |
| Functional Reach Test | | | 0.987 | 0.983 | 0.992 | 0.983 | 0.979 | 0.989 |