Bruna Leal de Freitas et al., Physiother Rehabil 2018, Volume 3
DOI: 10.4172/2573-0312-C1-003

Analysis of interaction of different devices in a virtual reality task in individuals with Duchenne muscular dystrophy

Bruna Leal de Freitas[1], Talita Dias da Silva[1], Tânia Brusque Crocetta[1], Thais Massetti[1], Fatima Aparecida Caromano[1], Shelly Coe[2], Luciano Vieira de Araújo[1], Helen Dawes[2] and **Carlos Bandeira de Mello Monteiro[1]**

[1]University of São Paulo, Brazil

[2]Oxford Brookes University, UK

Introduction: Duchenne muscular dystrophy (DMD) is characterized by the progressive and irreversible weakening of muscles that leads to severe physical disability. Interactive devices using virtual reality software can enable individuals with DMD to achieve autonomy and independence.

Objective: The aim of this study was to compare the performance of different devices of interaction (Leapmotion, Touchscreen and Kinect system) in a virtual reality task.

Methods: The study included 120 individuals, 60 DMD ranging from 9 to 34 years (mean 16 years) and 60 control group (CG) matched by age and gender. The task presented in a computer screen with 126 blue bubbles and the goal was for individuals to change the color (from blue to gray) for the largest number of bubbles possible during 10 seconds (the results presented with mean scores "M"), using all three devices.

Results: All participants had improved performance with practice, regardless of the interface used. The DMD group had significantly worse results compared to control. On comparison of the interfaces, in the CG the performance was significantly better in touch screen (M=105) when compared to leap motion (M=86) and kinect (M=81). In DMD group, the opposite happened, the performance was better in leap motion (M=62) when compared with touch screen (M=50) and kinect (M=54).

Conclusion: Leap motion interface provided better performance for individuals with DMD due to allowed distal muscle function and ease of instrument adjustment while the CG performed better on touch screen interface due to the possibility of haptic information and response speed offered by the interface.

Recent Publications

1. Jung I Y, Chae J H, Park S K, Kim J H, Kim J Y and Kim S J (2012) The correlationanalysis of functional factors and age with Duchenne muscular dystrophy. Annals of Rehabilitation Medicine 36(1):22-32.
2. Crocetta T B, Araújo L V, Guarnieri R, Massetti T, Ferreira F H I B, Abreu L C and Monteiro, C B M (2017) Virtual reality software package for implementing motor learning and rehabilitation experiments. Virtual Reality DOI: 10.1007/s10055-017-0323-2.
3. Iosa M, Morone G, Fusco A, Castagnoli M, Fusco F R, Pratesi L and Paolucci S (2015) Leap motion controller for stroke rehabilitation. Topics in Stroke Rehabilitation. 22 (4).

Biography

Bruna Leal de Freitas has completed her Postgraduate program in Rehabilitation Sciences, from School of Medicine, University of São Paulo, Brazil.

fisio.brunaleal@gmail.com