

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/315912203>

# Nintendo Wii decrease spasticity and improves standing balance in cerebral palsy

Conference Paper · July 2016

---

CITATIONS

0

---

READS

53

1 author:



Valeska Gatica-Rojas

Universidad de Talca

44 PUBLICATIONS 229 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Spinal cord injury [View project](#)



Virtual reality [View project](#)

# Nintendo Wii decrease spasticity and improves standing balance in cerebral palsy

Gatica-Rojas V<sup>1\*</sup>

<sup>1</sup>Human Motor Control Laboratory, Faculty of Health Sciences, University of Talca, Talca, Chile.

Email: vgatica@utalca.cl

## Background

Spastic cerebral palsy (SCP) commonly presents neuromuscular alterations such as co-contraction, hypertonia and spasticity. Spasticity is manifested by increased of stretch reflex, where a lack of modulation of the stretch reflex causes premature and/or exaggerated muscle contraction that may resist the passive stretch. Spasticity in the ankle plantarflexors can directly affecting the postural stability and standing balance.

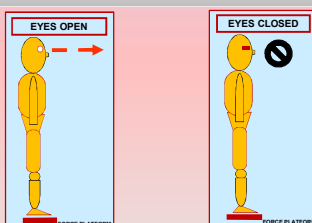
## Objective

The aim of the current study was to evaluate the effects of a Nintendo Wii exercise program on the ankle spasticity and the quiet standing balance in SCP.

## Methods

Ten children and adolescents (aged 6-17 years) with SCP (6 hemiplegic, 3 diplegic y 1 monoplegic) participated in a exercise program with Nintendo Wii Balance Board (NWBB). The intervention lasted six weeks, 3 sessions per week, 25 minutes each session. Ankle spasticity was assessed using the Modified Modified Ashworth Scale (MMAS) [3], and quiet standing balance (QSB) with center of pressure (COP) using a force platform (AMTI OR67) [4]. Baseline and post-intervention data were compared using paired t-test ( $p \leq 0.05$ ).

## Quiet Standing Balance (QSB)



## MMAS

- 0 = no increase in muscle tone
- 1 = a slight increase in muscle tone, manifested by a catch and release, or minimal resistance at the end of the range
- 2 = marked increase in muscle tone, manifested by a catch in the middle range and resistance throughout the remaining range of motion, but affected part easily moved
- 3 = considerable increase in muscle tone; passive movement through joint ROM is difficult
- 4 = affected body part remains rigid in flexion and extension

## Nintendo Wii Balance Board (NWBB): exercise program



## Results

Participants show a significant spasticity decrease in the ankle plantiflexors ( $p < 0.001$ ). Besides, decreased the area of COP sway ( $COP_{Sway}$ ) ( $p = 0.042$ ).

## Conclusion

Six-weeks NWBB exercise program reduced the spasticity at the ankle plantiflexors and improved the quiet standing balance in young people with SCP.