

INFLUENCE ON BALANCE IN COMMUNITY-DWELLING ELDERLY AND OLD PEOPLE

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Objective

To determine the influence of the application of virtual reality (console gaming platform) on balance in institutionalized elderly and old people.

Materials and methods

Including criteria:

no previous experience with activity promoting video games; willingness to participate; to be able to follow instructions; to be able to walk independently more than 10 meters

Excluding criteria:

severe sensory deficits; severe visual or hearing impairment; ataxia or other cerebellar symptoms; severe deformities or locomotion problems; uncontrolled hypertension, decompensated diabetes or high functional class heart failure

The total points of Berg Balance Scale twice (at the beginning and at the end of the intervention) have been reported.

Ten institutionalized older individuals voluntarily attended were involved. Eight women and two men of average age of 80.6 ± 7.25 years, most of them with length of stay less than 1 year, have been monitored.

The intervention program:

interactive video games by home video game console Xbox 360 with standard display technology

four games were selected: "Skiing" (fig.1), "Boxing" (fig.2), "Shootout" (fig.3) and "Dances" (fig.4) for 5 days a week, for 4 weeks with duration of 20 to 40 minutes.

Measurement

Berg Balance Scale - a 14-item objective measure designed to assess static balance and fall risk in adult populations with maximum score 56 (1).



Fig. 1. Video game "Skiing"



Fig. 2. Video game "Boxing"



Fig. 3. Video game "Shootout"



Fig. 4. Video game "Dances"

RESULTS

The intervention program with interactive video games improves significantly the total score of Berg Balance Scale (fig. 5) with 11,6 points ($p < 0,01$).

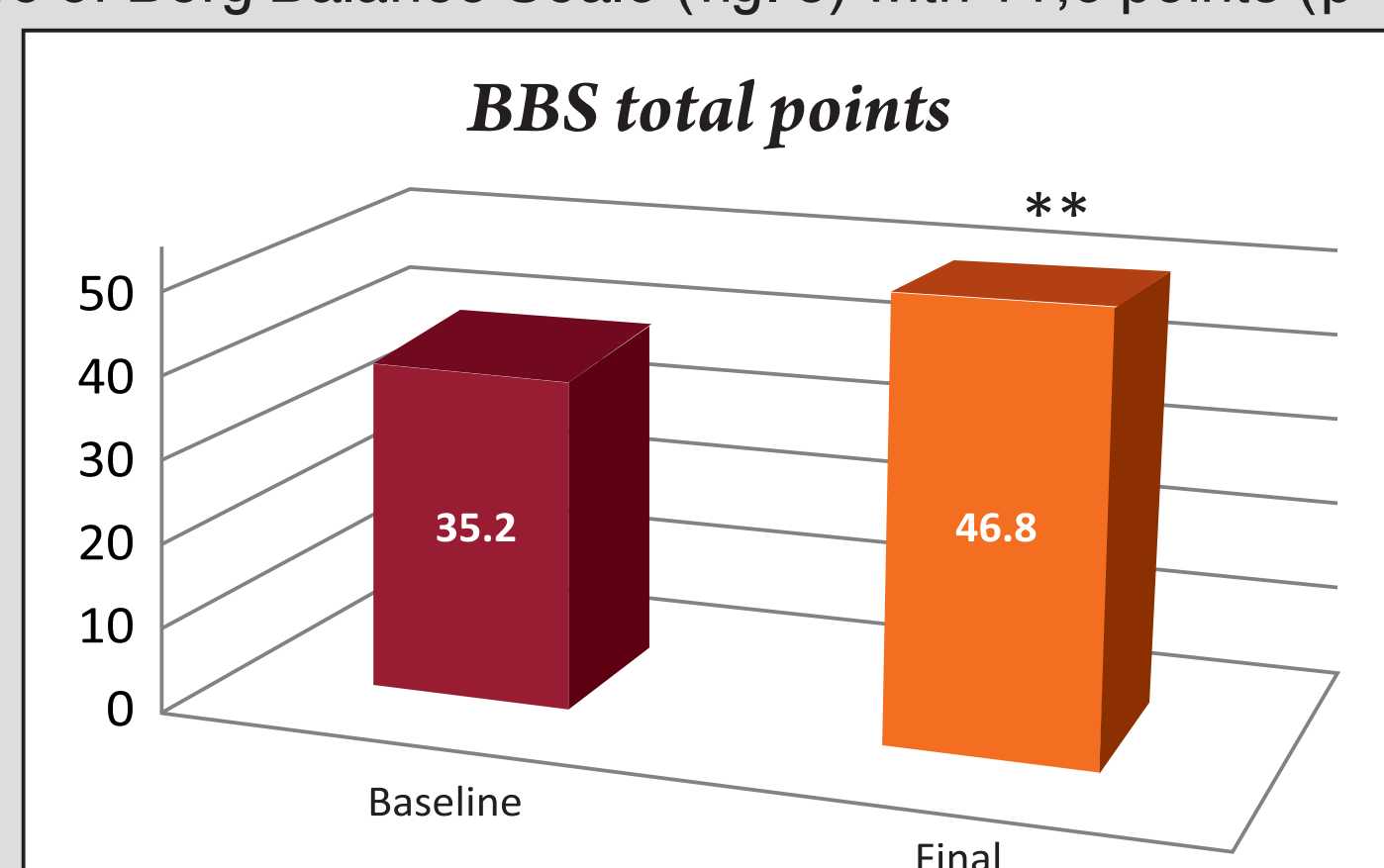


Fig. 5. The mean values of Berg Balance Scale total score
BBS - Berg Balance Scale; ** $p < 0,01$

DISCUSSION

The whole body activity promoting video games involve repetitive, voluntary movements, varied in direction, speed, amplitude, and precision and may positively affect the postural control. The changes in Berg Balance Scale total score are considered as a predictor of falling risk in older people. The baseline total points in this study group were mean 35.2 ± 1.93 which indicates medium fall risk and walking with assistance. The final total score were mean 46.8 ± 2.61 which indicates low fall risk and independent walking. The difference of 11.6 points observed in our study group is genuine change in function between 2 assessments (2) and revealed the positive influence of video games on static and dynamic balance.

CONCLUSIONS

An intervention using commercial video games may influence the balance reactions and risk of falling from moderate to low in institutionalized elderly and old people.

References:

1. Boulgarides LK, McGinty SM, et al. (2003) Use of clinical and impairment - based tests to predict falls by community - dwelling older adults. Phys Ther. 83:328 - 339
2. Donoghue, D., Stokes, E. K. (2009). "How much change is true change? The minimum detectable change of the Berg Balance Scale in elderly people." J Rehabil Med 41 (5): 343-346