

Effects of a Drums Alive® Intervention on trained motor skills, cognitive and conditional parameters in seniors living in nursing homes

P.R. WRIGHT¹, G. SCHLEE², H. SCHULZ¹

¹ Chair of Sports Medicine, ² Chair of Biomechanics, Technical University; Chemnitz/Germany

INTRODUCTION

Physical activity at the senior age has various positive effects on the aging process. (HOLLMANN, STRÜDER 2009). Thereby conditional and coordinative parameters can be improved insistently. In this context KRAMPE et al. (2010) showed substantial improvements in gait patterns whereby the risk of falls could be reduced significantly. Other studies monitored significant muscle growth as well as improvements in bone density (MCCARTNEY et al., 1996). Therefore trained motor skills such as stair climbing and walking could be coped much better. Regarding the coordinative skills, significant differences between trained and untrained elderly women could be shown after conducting a homolateral hand-foot-coordination training in terms of rhythmic gymnastics (CAPRANICA et al., 2005).

In this regard a comparison of different interventions combining aspects of music therapy as well as exercise therapy is of special interest. Thereby interventions which include drumming and/or percussion could be very promising as mankind traceable has been drumming since the Late Neolithic. In the course of human history drumming has become extremely important in all human cultures (FIGL, 2003). Hence a high compliance of the elderly is expected.

This study examined the effects of a new fitness trend named DRUMS ALIVE®, which includes aspects of exercise therapy as well as music therapy, in comparison to a body-percussion program in terms of a hand-foot-coordination training. Thereby the effects on trained motor skills as well as cognitive and conditional performance were of particular interest.

METHODS

Subjects

25 subjects of two different nursing homes participated in the study [10♂/15♀]. The average age was 82.16 years [±8.59]. All subjects have been divided into two intervention groups: one group [n=12] conducted the hand-foot-coordination training [Bodypercussion=BPC] and the second group [n=13] performed the age-specific Drumming on big gymnastic balls [Drums Alive®=DA].

Furthermore these groups have been divided into sub-groups, that were defined by their health prerequisites and mobility. Seniors living in the nursing home PROSENIORE [n=15] were able to walk, lived independently and showed few comorbidities. Subjects of the nursing home AZURIT [n=10] had significant limitations such as dementia and other severe cognitive impairments as well as amputations with high levels of care.

Interventions

As mentioned above the interventions consisted of a Body-Percussion-Program [BPC] which can be named as hand-foot-coordination training as well and the age-specific Drums Alive®-Intervention [DA] which in the fitness industry is also known as GOLDEN BEATS. Both interventions included music to which the subjects should be moving. Over a duration of one month, the seniors trained twice a week for 45 to 60 minutes.

Regarding the type of intervention and the two different nursing homes the subjects were recruited from, the following groups have been emerged: PROSENIORE: DA [n=9] and BPC [n=6] AZURIT: DA [n=5] and BPC [n=5]



Abb. 1: Drums Alive® Intervention in standing and sitting position



Abb. 2: Systolic and diastolic resting blood pressure in the DA-Group before and after the 4-week intervention

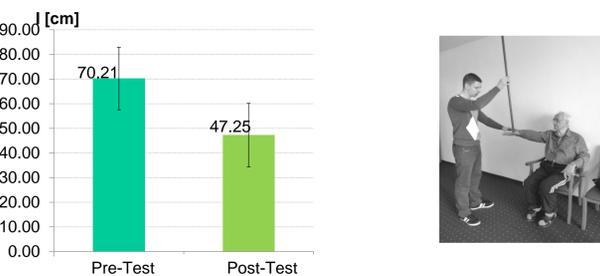


Abb. 3: Change of reaction time in the DA-group before and after the 4-week intervention

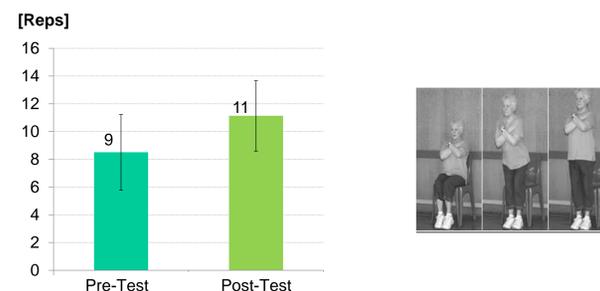


Abb. 4: Change of number of repetitions in the Chair-Raise-Test in the DA-group before and after the 4-week intervention

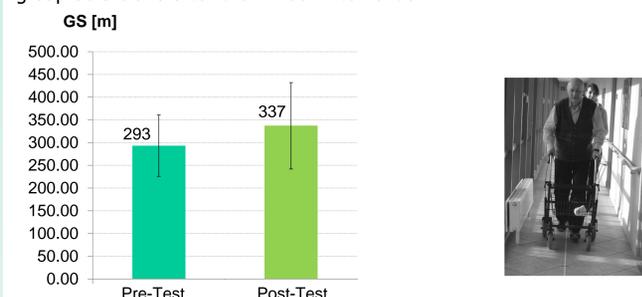


Abb. 5: Change of walking distance in the 6-Min.-Walk-Test in the DA-group before and after the 4-week intervention

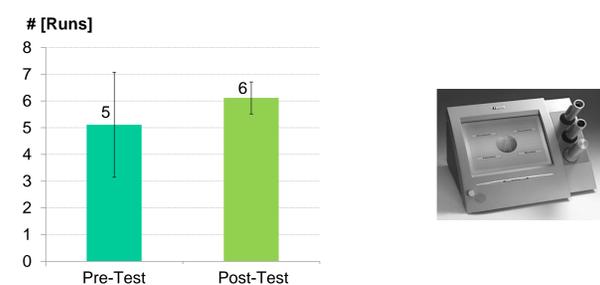


Abb. 6: Change of memory function in the DA-group before and after the 4-week intervention

Tests

Pre- and Post-tests consisted of blood pressure measurement Ruler-Drop-Test, Chair-Raise-Test, 6-Minute-Walk-Test as well as a test for memory function and concentration. Furthermore the balance abilities of the subjects have been analysed by means of measuring the dynamometric distribution of pressure and thereby determining the „Point of Pressure“.

During the training sessions also heart rate, blood pressure as well as blood flow by means of sonography have been investigated.

RESULTS

The presented results are only extracts of the entire study and refer to the DA-group [n= 9] with less comorbidities and higher levels of independent living and mobility [ProSeniore-Group].

Resting Blood-Pressure

Systolic blood pressure in the DA-group was reduced significantly from 145 to 135 mmHg [p<0.046] and diastolic pressure from 76 to 71 mmHg [p<0.036].

Ability to respond: Ruler-Drop-Test

Subjects also showed highly significant improvements in the Ruler-Drop-Test [p<0.001] from 65.51± 15.00 [cm] to 47.64± 16.93 [cm] which results in a much better reaction time.

Trained Motor Skills : Chair-Raise-Test

In the Chair-Raise-Test significant enhancements could be recorded as well [p<0,009]. Subjects improved from 9± 4 to 11± 4 Repetitions.

Trained Motor Skills: Walking-Test

The walking distance measured in the 6-Minute-Walk-Test increased significantly from 293m [±67.60] to 337m [± 95.11] .

Cognition: Short-Term-Memory-Test

In this test, where subjects had to remember sequences of numbers, significant improvements could be shown as well [p< 0.05] from 5 ±2 series to 6 ±1 series.

CONCLUSIONS

The age-specific Drums Alive® „Golden Beats“ intervention has light hemodynamic effects which are expected in other sports activities as well. Especially in the area of the allday-living-relevant trained motor skills like standing up, walking and the ability to respond Drums Alive showed positive effects. Also the results which are not presented here like balance abilities are very promising. Looking at the improvements in the area of cognition, the observed positive changes are interesting and promising as well. However, further research possibly should include higher intensities and longer intervention periods to prove significant improvements in different areas. Based on the presented study a conclusive comparative assessment to different exercise-therapy interventions is not yet possible.

REFERENCES

- Capranica, L.; Tessitore, A.; Olivieri, B.; Pesce, C.: Homolateral hand and foot coordination in trained older women. Rome, 2005
- Figl, J.: Handbuch der Religionswissenschaft. Religionen und ihre zentralen Themen. Wien, 2003.
- Hollmann, W.; Strüder, H. K.: Sportmedizin. Grundlagen für Arbeit, Trainings- und Präventivmedizin. Stuttgart 2009
- Krampe, J.; Rantz, M.; Dowell, L.; Schamp, R.; Skubic, M.; Abbott, C.: Dance-Based Therapy in a Program of All-Inclusive Care for the Elderly . Nursing Administration Quarterly, 34(2), 156-161, 2010.
- McCartney, N.; Hicks, A.; Martin, J.; Webber, C.: A longitudinal trial of weight training in the elderly: continued improvements in year 2. The journals of gerontology. Series A, Biological sciences and medical sciences, 51 (6), 425-433, 1996.