

differences in the initial values for the various tests between the two groups were found. When compared the pre and post training values, the GC showed significant improvements in both functional tests and 1RM; GE showed significant improvements in all tests. In the comparison between groups, GE presented the best result for test GUD ($4.7 \pm 2.8\%$ vs $1.9 \pm 2.8\%$; $p < 0.01$). The two types of workouts increase the lower limb strength and functional capacity in people with MS. Furthermore, the EERT seems to be more efficient in increasing the power of lower limbs.

Acknowledgement

Consejería de Sanidad-Junta de Castilla y León, Conselho Nacional de Desenvolvimento Científico e Tecnológico-CNPq and Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior-CAPES

References:

- Roig, M., Shadgan, B., & Reid, W. D. (2008). Eccentric exercise in patients with chronic health conditions: a systematic review. *Physiotherapy Canada*, 60(2), 146-160.
- Fernández-Gonzalo, R., Nissemark, C., Åslund, B., Tesch, P. A., & Sojka, P. (2014). Chronic stroke patients show early and robust improvements in muscle and functional performance in response to eccentric-overload flywheel resistance training: a pilot study. *Journal of NeuroEngineering and Rehabilitation*, 11, 150-160.

Concurrent validity of a taekwondo specific aerobic test

Fernando Rocha^{1,2}, Hugo Louro^{2,3}, Ricardo Matias⁴, João Brito^{2,3}, Aldo M. Costa^{1,2}

1. Department of Sport Sciences, University of Beira Interior, Portugal; 2. Research Center for Sport, Health and Human Development (CIDESD), Portugal; 3. Sports Sciences School of Rio Maior, Polytechnic Institute of Santarém, Portugal; 4. School of Healthcare, Setúbal Polytechnic Institute, Portugal; mcosta.aldo@gmail.com

The literature refers to cycle ergometers or treadmills as laboratory test to assess VO_2max . None of these modes of exercise reproduce the taekwondo technical movements. We proposed to verify the possibility of determining the maximal oxygen uptake for taekwondo athletes through an incremental specific test. Seventeen male elite taekwondo athletes (17.6 ± 4.3 years; $172\text{cm} \pm 6.5\text{cm}$ of height; $61.3\text{kg} \pm 8.7\text{kg}$ for weight) participated in this study. A two graded maximal exercise tests on different days was performed: the 20-meter multistage shuttle run test (SRT) and the incremental taekwondo specific test (TST). In both tests we recorded oxygen uptake (VO_2max), ventilation (VE) heart rate (HR), and time to exhaustion. Differences were found between observed and estimated VO_2max values [$F_{(2, 16)} = 5.77$, $p < 0.01$]; posthoc subgroup analysis revealed the existence of significant differences ($p = 0.04$) between the estimated VO_2max value in the SRT and the observed value recorded in the TST (58.4 ± 6.4 ml/kg/min and 52.11 ± 6.9 ml/kg/min, respectively). Our analysis also revealed a moderate correlation between both testing protocols (SRT and TST) regarding the VO_2max ($r = 0.62$; $p = 0.04$), the test time ($r = 0.77$; $p = 0.02$) and also the VE ($r = 0.69$; $p = 0.03$), pointing to an acceptable concurrent validity. An equation/model to estimate VO_2max during the TST was produced based on the mean HR, TST_time, height, and weight, which explained 74.3% of the observed VO_2max variability. A moderate correlation was found between observed and predicted VO_2max values in the TST ($r = 0.74$, $p = 0.001$). Our results suggest that an incremental specific test seems to estimate VO_2max of elite taekwondo athletes with satisfactory accuracy and reliability.

References:

- Bridge, C. A., Santos J. F. S., Chaabène, H., Pieter, W., & Franchini, E. (2014). Physical and physiological profiles of Taekwondo athletes, Review article. *Sports Medicine*, 44, 713-733.
- Falcó, C., & Estevan, I. (2014). Biomechanics in Taekwondo: practical applications. In M. Haddad (Ed.), *Performance optimization in Taekwondo: from laboratory to field* (pp. 1–23). Foster City, CA: OMICS Group eBooks.
- Léger, L. A., & Lambert, J. (1982). A maximal multistage 20-m shuttle run test to predict VO_2max . *European Journal of Applied Physiology*, 49, 01-12.
- Sant'Ana, J., Silva, J. F., & Guglielmo, L. G. A. (2009). Variáveis fisiológicas identificadas em teste progressivo específico para Taekwondo. *Motriz, Rio Claro*, 15(3), 611-620.

After school sports influence on 4th graders dexterity performance

Luís Coelho^{1,2}, Ian Moirinho^{1,2}, Carolina Ribeiro^{1,2}, Nuno Amaro^{1,2}, Nuno Santos^{1,2}, Rogério Salvador^{1,2}, João Cruz^{1,2}, Rui Matos^{1,2}

1. School of Education and Social Sciences – Polytechnic Institute of Leiria; coelho@ipleiria.pt; 2. Life Quality Research Centre

Manual ability and performance of dexterity tasks require both gross and fine hand motions and coordination (Golubović & Slavković, 2014). Fine motor skills is still one of the specific components to be assessed when evaluating children's functional performance at home, in school and at play (Chui, Ng, Fong, Lin, & Ng, 2007). Does children that are engaged on after school sports regularly have better dexterity? The main purpose of this work is to analyze after school sports association with dexterity performance (DP) in children. A sample of 53 4th graders was used (30♂ and 23♀, 38 play some type of after school sports and 15 doesn't). Dexterity assessment was performed by using the Placing Test from Minnesota Manual Dexterity Test, twice. First using dominant hand (DH) and second with the non-dominant hand (NDH). Bilateral dexterity symmetry (BDS) was calculated by its difference ($\text{DH} - \text{NDH} = \text{BDS}$). A very similar performance between both