

## **The effects of a 10-week plyometric training intervention on jump performance in professional ballet dancers**

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**Purpose:** The aim of the study was to find out if a 10-week plyometric intervention program has a positive effect on jump performance of professional ballet dancers. **Study Design:** Field-based quantitative intervention study. **Method:** 11 (8 male, 3 female) professional ballet dancers between 19 and 34 years old (i.e. intervention group) participated in a 10-week plyometric intervention, consisting of one weekly lead training session from low to moderate and high plyometric exercises. 6 (3 male, 3 female) professional ballet dancers between 19 and 34 years old acted as a control group executing their normal daily routine. Pre- and post-tests were conducted under field conditions with a myotest device to monitor the effects of plyometric exercises on jump height, power, force, velocity, contact time, reaction time and leg stiffness during counter movement jumps (CMJ), counter movement jumps on the right leg (CMJR), counter movement jumps on the left leg (CMJL) and plyometric jumps (PLJ), plyometric jumps on the right leg (PLJR), plyometric jumps on the left leg (PLJL) as well as jump distance in a dance-adapted long jump (jeté). In addition to quantitative measures, qualitative measures will be conducted. Qualitative measures from counter-movement jumps will be assessed using an adapted Landing Error Score System (Padua, Di Stefano, Beutler, De la Motte, DiStefano & Marshall, 2015). Plyometric jumps will be analysed and adapted according to the Tuck Jump Assessment test (Myer, Ford, & Timothy Hewett, 2008).

Furthermore, the Kolmogorov-Smirnoff test showed not normally distributed data. Therefore, Mann-Whitney-U tests of the differences (i.e. post-test minus pre-test values) were performed to check for significant differences between the two groups. Wilcoxon tests will be performed to check for significant differences between pre- and post-test parameters within the respective groups.

**Main findings:** The study is currently being evaluated in detail. Therefore, only provisional quantitative measures can be provided at this point. So far, no significant differences were observed between the intervention and control groups following the intervention program as all p-values were bigger than 0.05. However, more data will be available for the congress and those interested in more detail may contact me via email after the congress.

**Discussion/Conclusions:** Although current quantitative results show no significant differences between the groups for CMJ and PLY, some p-values close to 0.05 were found. This may indicate that plyometric training may have promising benefits to improve jumping height and jumping distance of professional ballet dancers. Reasons for the non-significant quantitative differences so far might be the small sample size, the timing of the post-tests during an extremely exhausting fortnight of rehearsals and the low frequency (once a week) of the intervention program.

### References:

Myer, G. D., Ford, K. R., & Timothy E. Hewett, T. E. (2008). Tuck Jump Assessment for Reducing Anterior Cruciate Ligament Injury Risk. *Athletic Therapy Today*, 13(5), 39–44. Padua, D. A., Di Stefano, L. J., Beutler, A. I., De la Motte, S. J., Di Stefano, M. J., & Marshall, S. W. (2015). The Landing Error Scoring System as a Screening Tool for an Anterior Cruciate Ligament Injury–Prevention Program in Elite-Youth Soccer Athletes. *Journal of Athletic Training*, 50(6), 589–595.

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