

## THE EFFECT OF ANKLE PLATFORM TRAINING ON ANKLE PROPRIOCEPTION IN SUBJECTS WITH UNILATERAL FUNCTIONAL ANKLE INSTABILITY

Wei-Hsiu Lin<sup>1</sup>, Ying-Fang Liu<sup>2</sup>, Ya-Wen Liu<sup>3</sup>, and Alex, J. Y. Lee

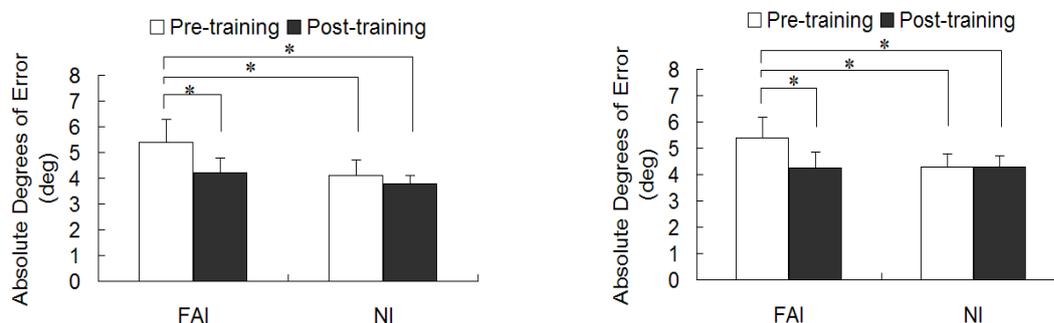
National HsinChu University of Education, Taiwan; <sup>1</sup> Tzu-Chi College of Technology, Taiwan; <sup>2</sup> Hsin-Sheng College of Medical Care and Management, Taiwan; <sup>3</sup> Yu-Da College of Business, Taiwan

**KEY WORDS:** ankle instability; sensorimotor; reposition sense

**INTRODUCTION:** Functional ankle instability (FAI) is defined as the subjective sensation of giving way or feeling joint instability after repeated episodes of ankle sprain (Riemann et al., 2003). The purpose of this study was to examine the effect of 12-week Biomechanical Ankle Platform System (BAPS) training on ankle reposition sense in subjects with unilateral FAI.

**METHOD:** Twelve university students (4 females and 8 males, age:  $20.1 \pm 1.4$  years, height:  $172.3 \pm 4.5$  cm; weight:  $67.7 \pm 4.8$  kg) with unilateral FAI volunteered as subjects. The active and passive ankle reposition senses (ARS and PRS) were assessed using an isokinetic dynamometer at 500 and 2 degrees per second. A twelve-week BAPS training program (3 times a week) and a progression test for controlling the board in certain directions and advancing to next training level was given to each subject. Repeated-measures 2-way analyses of variance were conducted by SPSS statistical software to determine differences in ankle proprioception between each limb before and after the training period.

**RESULTS:** The absolute degrees of error from pre-selected ankle angle in the FAI limb were significantly reduced after 12 weeks of training (Figure 1).



**Figure 1. Absolute degrees of error for ARS (left) and PRS (right) tests during the pre-training and post-training periods of the 12-week BAPS training program. \* denotes a significant difference from the respective value,  $p < 0.05$ . NI: non-injured limb.**

**DISCUSSION:** The enhanced ankle proprioception may be due to the improved mechanoreceptor function, which could lead to restoration of neuromuscular control of the joint, and demonstrated positive improvements after training (Clark & Burden, 2005). The findings of this study support the use of a 12-week BAPS training program as part of the rehabilitation for subjects with unilateral FAI.

### REFERENCES:

- Riemann, B.L., Tray, N.C., Lephart, S.M. (2003). Unilateral multiaxial coordination training and ankle kinesthesia, muscle strength, and postural control. *Journal of Sport Rehabilitation*, 12, 13-30.
- Clark, V.M., Burden, A.M. (2005). A 4-week wobble board exercise programme improved muscle onset latency and perceived stability in individuals with a functionally unstable ankle. *Physical Therapy in Sport*, 6, 181-187.

### Acknowledgement

Supported by National Science Committee and National HsinChu University of Education, TAIWAN.