

The Effects of Coordinative Locomotor Training Combined with Climbing on Trunk Muscles Thickness, Balance, and Self-efficacy

Park, Se-Ju

Dept. Physical therapy, Graduate School, Nambu University, Gwang-ju, Korea

The purpose of this study was to evaluate the effect of coordinative locomotor training (CLT) combined with climbing on the trunk muscle thickness, balance, and self-efficacy in normal adults, and provide basic data on its clinical applicability.

The participants in this study were a total of 30 college students in their 20s. The number of subjects who participated in all the training sessions excluding four dropouts was 13 persons in the climbing CLT training group (training group) and 13 persons in the group of CLT training on the ground (control group). The trunk muscle thickness, balance, and self-efficacy of the subjects in each group were measured before and six weeks after training. The subjects in each group performed CLT training 3 times a week for 6 weeks for a total of 40 minutes per session, and each session consisted of 10-minute warm-up exercise and 30-minute main exercise.

To investigate the trunk muscle thickness of the subjects, ultrasonography was used to measure the external oblique abdominal muscle, internal oblique abdominal muscle, transversus abdominis, multifidus, and the limits of stability were measured using Biorescue to determine the dynamic balance. A self-efficacy questionnaire was used to assess the self confidence, individual confidence, or beliefs in specific tasks.

A paired t-test was performed to compare the differences between measurements before and after training in each group, and an independent t-test was used to compare the differences between the groups.

As a result, the following results were obtained. First, in terms of the trunk muscle thickness, for the external oblique abdominal muscle, the comparison of variations in each group showed that there was a significant difference in the training group ($p < .05$) and the comparison of measurements between groups showed that there was a significant difference between the groups after training ($p < .05$). For the internal oblique abdominal muscle, the results of comparison of variations in each group indicated that there was a significant difference in the training group ($p < .05$), and the results of comparison of measurements between groups showed that there was a significant difference between the groups after training ($p < .05$). Second, in the limits of stability in the balance, the comparison of variations in each group revealed that there was a significant difference in the

training group ($p < .05$), and the results of the between- group comparison showed that there was a significant difference between the groups after training ($p < .05$). Third, regarding self-efficacy, the results of comparison of variations in each group showed that there was a significant difference in the training group ($p < .05$). The results of this study indicated that CLT training combined with climbing increased the thickness of the external oblique abdominal muscle and the internal oblique abdominal muscle of normal adults and positively affected balance and self-efficacy. Therefore, it was confirmed that CLT training combined with climbing is useful for rehabilitation of patients and clinical application of interventions.

Experimental methods

Experimental group: Climbing CLT (coordinative locomotor training) program 40 mins, 1 set(40 sec hold), 5 set, 3 times/a week, 6 weeks.

Control group: CLT(coordinative locomotor training) in ground program 40 mins, 1 set (40 sec hold), 5 set, 3 times/a week, 6 weeks.

Outcome measures

1) Trunk muscle thickness measurement

- Achievo CST (V2u Health

Care, Singapore)

- External oblique muscle, internal oblique muscle, transverse abdominal muscle, multifidus

2) Balance measurement

- Center of pressure

(Bio-rescue. RM INGENIERIE, France)

- Static balance, dynamic balance

3) Self-efficacy

- self-questionnaire

Key words: Coordinative locomotor training, Mild cognitive impairment, Physical factors in falls, Balance