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Handout
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Vertical Water Training Wins Big Points in The Fight Against Obesity Comparative Efficacy of Water and Land Treadmill Training for Overweight or Obese Adults

Department of Health and Kinesiology, Texas A&M University, College Station, TX
GREENE, NICHOLAS P.; LAMBERT, BRAD S.; GREENE, ELIZABETH S.; CARBUHN, AARON F.; GREEN, JOHN S.; CROUSE, STEPHEN F

Despite the proven health benefits of aerobic exercise training, traditional modes, such as walking and running, are often associated with an increased risk of musculoskeletal injury due to accumulated stress on the lower extremities, particularly in the obese. Pain and injury from exercise are often cited as reasons for discontinuing exercise training. To counter the problems that often limit exercise in the obese, the ACSM recommends non-weight-bearing exercise in this population. Aquatic aerobic exercise reduces the stress on the lower extremities and spine and has been recommended for individuals who are overweight and who have orthopedic diseases, such as osteoarthritis. However, few well-controlled studies have been published to quantify the effectiveness of aerobic water-based exercise training. Those that exist show that persons performing deep-water running, water walking, and aquatic dance training generally demonstrate similar improvements in aerobic capacity as those performing traditional land-based aerobic exercise training. The findings of this new study provide practitioners with evidence that aquatic exercise is effectual and can be confidently prescribed as a training modality in the treatment of adult obesity.

The purpose of this study was to compare changes in physical fitness, body weight, and body composition in physically inactive, overweight, and obese adults after 12 wks of land treadmill (LTM) or underwater treadmill (UTM) training. Fifty-seven physically inactive, overweight, and obese men and women participated in this investigation. The mean age, weight, body mass index (BMI), and V˙O2max upon entry were 44 ± 2 yr, 90.5 ± 2.4 kg, 30.5 ± 0.7 kg·m-2, and 27.1 ± 0.7 mL O2·kg-1·min-1, respectively. Subjects were randomly assigned to exercise three times per week for 12 wk on either LTM or UTM matched for intensity and volume. Session volume was progressively increased from 250 to 500 kcal per session by week 6 and remained at 500 kcal through week 12.

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After either UTM or LTM training, V˙O2max was significantly increased (+3.6 ± 0.4 mL O2·kg-1·min-1), whereas body weight (-1.2 ± 0.3 kg), BMI (-0.56 ± 0.11 kg·m-2), body fat percentage (-1.3% ± 1.3%), and fat mass (-1.1 ± 0.3 kg) were significantly reduced. Regional leg lean body mass (LBM) was significantly increased with both LTM and UTM (0.4 ± 0.3 and 0.8 ± 0.2 kg, respectively). An increase in total LBM approached significance with UTM training only (+0.6 ± 0.3 kg).

Interestingly, UTM training was accompanied by an average increase of 0.6 ± 0.3 kg (3.2%) in total lean body mass, a change from before training that approached significance. Comparatively, lean body mass was essentially unchanged (-0.1 ± 0.3 kg) after LTM training. Moreover, using DEXA to analyze body composition by body region showed that leg lean mass was significantly increased +0.4 ± 0.3 and +0.8 ± 0.2 kg after LTM and UTM training, respectively. Leg lean mass increase was twice as great after UTM training, but the difference between modes was not statistically significant.

Conclusions: UTM and LTM training are equally capable of improving aerobic fitness and body composition in physically inactive overweight individuals, but UTM training may induce increases in LBM. Thus, the findings provide practitioners with evidence that this novel form of exercise is effectual and can be confidently prescribed as a training modality in the treatment of adult obesity.

Compiled by Rob Duncan, CFA, PTS, OAS, CALA

CALA. Toronto, ON M1R 3W6. Tel: (416) 751- 9823. cala_aqua@mac.com . www.calainc.org