

Effects of Modified Arm Swing Exercise on Pulmonary Function, Pulmonary Ventilation and
Autonomic Nervous Functions in Metabolic Syndrome Patients

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Abstract

Introduction: Traditional arm swing exercise (TASE) can improve glycaemic control and lung function in type 2 diabetes patients. Modified arm swing exercise (MASE) may be more appropriate for improving pulmonary function and heart rate variability (HRV) of patients with metabolic syndrome (MetS) because it involves more movements. This study investigated and compared training effects of MASE and TASE on pulmonary function, pulmonary ventilation and HRV in MetS patients.

Methods: Sixty-two Thai female patients with MetS (by IDF criteria) were randomly divided to perform either TASE (n = 31) or MASE (n = 31). MASE and TASE groups exercise by 30 minutes/day, 6 days/week, for 12 weeks. Pre-ASE dynamic pulmonary function and pulmonary ventilation were measured before and after the training. HRV was measured before, immediately and after the exercise before and after the 12-weeks training.

Results: The results showed that MASE training increased the forced vital capacity (FVC) (2.3 ± 0.46), the forced expiratory volume in the first second (FEV_1) (1.8 ± 0.42) and the maximum voluntary ventilation. TASE training increased only FVC (2.4 ± 0.48). No significant effect of both exercises modes on ratio of FEV_1 and FVC. Only TASE training increased rMSSD (32 ± 12). No significant effect of exercise modes on HRV. MASE training increased minute ventilation (17.4 ± 3.70), tidal volume (0.66 ± 0.13) and breathing frequency (26.4 ± 4.18) when compare with TASE training (14.8 ± 3.10 , 0.63 ± 0.12 and 23.9 ± 4.68 respectively) ($p < 0.05$).

Conclusions: The findings of this study suggest that MASE training improved pulmonary function and pulmonary ventilation better than TASE but only TASE training improved rMSSD in MetS.

Keywords: Low-intensity exercise, Lung function, Heart rate variability, Minute ventilation