

Relationship between Chest Expansion and Hand Grip Strength in Young Obese Volunteers

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Abstract

Introduction: The prevalence of obesity has increased among young Thai population. Obesity is the root cause of many serious diseases including obstructive sleep apnea and hypoventilation syndrome. Data concerning respiratory muscle strength in obese population are narrow. Therefore, the purposes of this study aimed to investigate respiratory muscle strength determined by chest expansion and hand grip strength in obese and normal weight volunteers and to investigate relationship between those parameters in both groups.

Methods: This study was cross-sectional and age-match controlled study. Fifty volunteers aged 20.12 ± 0.59 years were divided into two groups of 25 each, including normal weight group (body mass index; BMI $20.40 \pm 1.34 \text{ kg.m}^{-2}$) and obese group (BMI $30.14 \pm 3.58 \text{ kg.m}^{-2}$). Middle chest expansion and hand grip power in all volunteers were measured for three times and the averaged value was then analyzed.

Results: Middle chest expansion was significantly lower in obese group compared to normal weight group (2.48 ± 0.16 vs 2.92 ± 0.72 cm, $p < 0.05$). However, this group showed significantly higher hand grip power (32.38 ± 1.42 vs 26.37 ± 6.17 kg, $p < 0.05$) than normal weight group. Moreover, data demonstrated a moderate relationship ($r = 0.41$, $p < 0.05$) between chest expansion and hand grip strength in obese group but not in the normal weight group.

Conclusions: Young obese volunteers had lower chest expansion and higher hand grip strength than normal weight volunteers. The negative correlation between chest expansion and hand grip strength was also noted in these volunteers.

Keywords: Obesity, Chest expansion, Muscle strength