

UNIVERSITI TEKNOLOGI MARA

**THE EFFECT OF INDOOR ROWING EXERCISE
ON MID-THIGH INTERMUSCULAR ADIPOSE
TISSUE VOLUME, 25- HYDROXYVITAMIN D,
LEPTIN AND ADIPONECTIN LEVELS IN YOUNG
ADULT OBESE SUBJECTS**

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Increased adiposity in obese individuals could restrict movement and lead to a further sedentary lifestyle. Thus, an optimal exercise programme needs to be identified as an intervention to reduce adiposity. Intermuscular adipose tissue (IMAT) is located in spaces between skeletal muscle bundles and beneath the fascia of the muscle. Like visceral adipose tissue, IMAT seems to be an important fat depot that could lead to health complications. Studies have shown that IMAT volume decreases following either aerobic or combined aerobic and resistance exercise training in obese subjects. Rowing provides both aerobic and resistance exercise training simultaneously. As a non-weight bearing form of exercise, rowing can be regarded as one of the safest exercises for obese adults. However, the effect of indoor rowing exercise on IMAT volume is not known. This study determined the effect of a 12-week indoor rowing exercise programme on mid-thigh IMAT volume; and determines the correlation between the pre and post changes in IMAT volume with that of 25-hydroxyvitamin D (25(OH)D) and adipokines in young adult obese subjects. Twelve young adult obese males and females (aged 18-35 years, BMI $\geq 30\text{kg/m}^2$) self-divided into an Intervention and a Control Group (n=6 respectively). The Intervention Group performed rowing exercise at 70-85% HR_{max} , 3 times per week for 12 weeks. Subjects in the control group continued with their daily activities as per their normal routine. All parameters were measured before and after 12 weeks in each group as well as between the groups. Bilateral mid-thigh (quadriceps) IMAT volume in both groups was determined using MRI scans at week 0 and 12. IMAT volume was then quantified using MATLAB software. 25(OH)D levels were quantified using HPLC, while adipokine levels were quantified using ELISA. There was no significant difference in mid-thigh IMAT volume, 25(OH)D and adipokines following indoor rowing exercise. Moreover, there was no significant correlation between pre and post exercise changes in mid-thigh IMAT volume with that of 25(OH)D, leptin and adiponectin. In conclusion, indoor rowing exercise at 70-85% HR_{max} did not seem to significantly affect mid-thigh IMAT volume, 25(OH)D, and adipokines in young adult obese subjects. This could be due to the small sample size, gender mix, exercise regimen or lack of dietary restriction among these subjects.

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