

**Prediction of Maximum Fat Oxidation from Six-Minute Walk Test, Anthropometric,  
and Cardiovascular Outcomes in Normal Weight Female Thai Adults**

Arisa Sespheng\*,\*\* Terdthai Tong-Un\*\*\* Ploypailin Aneknan\*\* Dr.Naruemon Leelayuwat\*,\*\*<sup>1</sup>

**ABSTRACT**

Maximum fat oxidation (FATmax) during exercise is an important marker for a potential treatment of obesity. However, the gold-standard method of assessing the FATmax has more limitations such as requiring expensive equipment, cost-intensive, trained personnel, and performing only in the laboratory. Six-minute walk test and anthropometric component and cardiovascular outcomes have been used to form a formula determining FATmax in Tunisian obese children. It is a simple field test measuring aerobic capacity (a moderate strength association between 6-minute walk distance (6MWD) and  $VO_2$ max [ $r = 0.49$ ;  $P = 0.001$  (Burr JF, 2011)]. It showed good validity, and reliability [ICC=0.86-0.99]. This formula has never been obtained in Thai population including adults. Seventy healthy sedentary women (age  $41 \pm 7.8$  yr, body mass index  $22 \pm 1.8$   $kg/m^2$ ) performed submaximal cycling test to determine actual FATmax. The 6MWD, anthropometric, and cardiovascular outcomes were included to create the equation predicting FATmax. Mean of FATmax is  $85.7 \pm 63.9$  mg/min and 6MWD is  $577.5 \pm 43.7$  m. Multiple quantile regression analyses revealed that the combinations of 6MWD with age, hip circumference (H) and heart rate (HR) improved the predictability of the model ( $R^2=0.18$ ,  $p$ -value  $< 0.05$ ). This study has established the equation predicting FATmax (mg/min) which is  $FATmax (mg/min) = 296.33 + 0.45 \times 6MWD(m) - 3.44 \times H(cm) - 2.36 \times HR(/min)$  in normal weight female Thai adults. However, this equation needs to be verified before further implication.

**Keywords:** Aerobic capacity; Maximum fat oxidation; Prediction equation; Female Thai adults

<sup>1</sup>Corresponding author: Associate Professor, Dr.Naruemon Leelayuwat, PhD, Exercise and Sport Sciences Program, Graduate school, and Exercise and Sport Sciences Development and Research Group, Khon Kaen University, Thailand., e-mail: [naruemon@kku.ac.th](mailto:naruemon@kku.ac.th), [naruemon.leelayuwat@gmail.com](mailto:naruemon.leelayuwat@gmail.com)

\*Exercise and Sport Sciences program, Graduate School, Khon Kaen University, Khon Kaen, Thailand.

\*\*Exercise and Sport Sciences Development and Research Group, Khon Kaen University, Khon Kaen, Thailand.

\*\*\*Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.