

Correlation Between Energy Expenditure and Movement Activity of Body Extremities on Stroke Rate and Stroke Velocity among National Rower Male Athlete (Pilot Study)

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Abstract

**Background:** Rowing is popular sport throughout the world. Appropriate energy expenditure, movement patterns and strokes rate are important in successful athlete. Energy expenditure can be determined by the level of effort required for rowing to provide sufficient energy to meet the needs on the competition. There are important to implemented in developing athlete to highest performance on competition.

**Objectives:** To determine a correlation between energy expenditure and movement activity of body extremities on stroke rate and stroke velocity among national rowing male athletes.

**Hypothesis:** The duration of rowing (seconds) has positively correlated with different energy expenditure, movement activity, stroke velocity and stroke rate.

**Method:** Three male rowing athletes (n=3) with the age  $22.33 \pm 2.30$  years. Participants had tested for weight, height measurements and body composition for their baseline characteristic. The athletes perform regular rowing and attached with ActiGraph GT9X accelerometer including 5 portable movement sensors in there both wrists, waist and both ankles. Then the speed of rowing was measured for a distance of last 700 meters of 2000 meter.

**Results:** Excellent correlation were found on time of rowing compared with energy expenditure right wrists ( $r = .971$ ) and time of rowing between with energy expenditure waist ( $r = 1.000$ ). Good correlation were found in time of rowing between with energy expenditure left wrists ( $r = .732$ ), time of rowing amidst energy expenditure right ankle ( $r = .895$ ) and time of rowing between energy expenditure left ankle ( $r = .770$ ) ( $p \leq 0.01$ ). In contrast, time of rowing is negatively correlated with stroke rate ( $r = -1.000$ ) ( $p \leq 0.05$ ).

**Conclusion:** Energy expenditure of waist are important to time of rowing while stroke rate has negatively correlated with the speed in national rower male athlete.

**Keywords:** Energy expenditure, Stroke rate, Rowing, Accelerometer