

A Validation Study Of A Continuous Body-monitoring Device: Assessing Energy Expenditure At Rest And During Exercise: 150 Board #57 9:30 AM - 11:00 AM

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PURPOSE

The purpose of this study was to determine the validity of the Bodymedia Senseware Armband (BSA) to measure energy expenditure during resting and walking conditions. The Armband utilizes a 2-axis accelerometer, heat flux sensor, galvanic skin response sensor, skin temperature sensor and a near-body ambient temperature sensor to capture data leading to the calculation of energy expenditure.

METHODS

Twenty-three subjects, who were devoid of health complications, were recruited for the study. Indirect calorimetry was used as the criterion measure for energy expenditure. Each participant completed a rest-exercise-rest protocol while wearing the armband on the right triceps. The 45-minute protocol was divided into three 15 minute conditions: 15 minutes of supine rest, 15 minutes of treadmill walking at 3.5 mph and 15 minutes of supine rest. Energy expenditure was measured for each 15-minute increment and total energy expenditure from indirect calorimetry and the armband. Pearson Product Moment Correlations were used to determine criterion validity for the three conditions and total energy expenditure. Alpha level was set .05 a priori.

RESULTS

The results show significant correlations for the first rest condition ($r = .79$, $p = .000$), walking condition ($r = .94$, $p = .000$), and the second rest condition ($r = .83$, $p = .000$). BSA total energy expenditure was also significantly correlated with indirect calorimetry ($r = .95$, $p = .000$).

CONCLUSIONS

The armband is a valid method to measure energy expenditure and will allow researchers to validly measure energy expenditure in a free-living environment.