

## The Effects of Body Composition on Resting Metabolic Rate among College Aged Students.

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### ABSTRACT

Resting metabolic rate (RMR) is the measure of daily energy expenditure while the body is at rest. RMR is becoming more useful in order to measure the energy demands in both athletes and non-athletes.

**PURPOSE:** The purpose of this study is to analyze the RMR among college aged students, along with their body compositions in order to determine if there is a correlation between body fat percentage and RMR.

**METHODS:** Participants in this study included 19 students at Midwestern State University between the ages of 19-25. (n = 19; female = 12; male = 7). Participants were asked prior to their initial measurements about their fitness status and were placed into either a physically active (PA) group or a sedentary group (S). Each participant was assigned a date and time in the morning for resting measurements, including: height (cm), weight (kg), resting heart rate (RHR), body fat percentage (%) and RMR (kcal). A Pearson Product R Correlation Coefficient was run to determine association between RMR, body fat percentage and other variables. Results are represented as means and standard deviations ( $\pm$ SD). Statistical significance was set *a priori* at  $p \leq 0.05$ . **RESULTS:** A total of 19 participants were tested in this study (PA=15, S=4). Because there were only four (4) participants determined to be sedentary, statistical analysis was run as one sample size of 19 rather than two separate groups. The mean RMR of the participants was  $1858.95 \pm 337.55$  kcal\*day<sup>-1</sup>. There were no significant correlations between RMR and body fat percentage ( $r = -0.4$ ,  $p > 0.05$ ). There were significant correlations in height and weight when related to RMR ( $r = 0.75$ ;  $r = 0.68$ , respectively). A post hoc analysis with BMI was then conducted. Mean (SD) BMI of the participants was 25.11 (2.89) kg\*m<sup>-2</sup>. There was no significant association between BMI and RMR ( $r = 0.30$ ,  $p > 0.05$ ). Lean body mass (LBM) was observed to have a significant correlation with RMR ( $r = 0.83$ ,  $p < 0.05$ ). A post hoc analysis was conducted in order to determine gender differences between the subjects. BMI was not significantly different between males and females ( $p = 0.79$ ,  $p > 0.05$ ). **CONCLUSION:** Body fat percentage is not significantly correlated with RMR. However, body composition does affect RMR, specifically through LBM.