

Correlations Between Measured-to-Predicted Resting Metabolic Rate Ratio and Psychological Variables in Active Women

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ABSTRACT

RMR_{ratio} provides an indication of energy availability by comparing measured resting metabolic rate (RMR) to that predicted by an equation using values such as age, height, and lean mass. RMR_{ratio} has been associated with psychological variables such as cognitive restraint (CR) and Drive for Thinness (DT) in young, active women. **PURPOSE:** The purpose of this study was to assess the strength of correlation between these psychometric variables and RMR_{ratio} values using a variety of RMR prediction equations. **METHODS:** Forty-one generally healthy women were included in this analysis. All participants self-attested to engaging in two or more hours of moderate- to vigorous-intensity exercise per week, of any modality, for the past three months or more. Participants abstained from all food, fluid, caffeine, and alcohol for at least 8 hours and from exercise for at least 24 hours prior to their visit. Body fat percentage (BFP) was obtained via dual-energy X-ray absorptiometry (DXA; Lunar iDXA, General Electric). RMR was measured using a metabolic cart (TrueOne 2400, Parvo Medics) with ventilated hood. After 30 minutes of supine rest, gas was collected for a minimum of ten minutes with the first five minutes discarded. Data were collected until coefficients of variation <10% for VO₂ and VCO₂ and <5% for RMR were achieved, with the average of the final five minutes used. CR was assessed using the Three-Factor Eating Questionnaire Revised 18-item form (possible range: 6-24) and DT was assessed using the raw score generated from the Eating Disorder Inventory 91-item questionnaire (possible range: 0-21). RMR_{ratio} values were calculated using five equations (Harris-Benedict 1918; Cunningham 1980 and 1991; DeLorenzo 1999; and ten Haaf & Weijs 2014). As CR and DT scores were considered non-parametric data, correlations were analyzed using Spearman's ρ corrected for multiple comparisons. **RESULTS:** Participants (mean \pm SD age: 21.7 \pm 3.7 years, height: 164.4 \pm 6.1 cm; weight: 64.8 \pm 9.3 kg; BFP: 33.2 \pm 5.9%) had an average measured RMR of 1624 \pm 191 kcal/day, CR score of 12.4 \pm 4.0, and DT score of 4.2 \pm 5.6. Correlation values with CR ranged from -0.39 (ten Haaf & Weijs) to -0.29 (Cunningham 1991) and were statistically significant ($p < 0.05$) for only the DeLorenzo and ten Haaf & Weijs equations ($ps \leq 0.04$). Correlation values with DT ranged from -0.27 (ten Haaf & Weijs) to -0.14 (Cunningham 1991) but were not statistically significant for any equation (all $ps \geq 0.31$). **CONCLUSION:** In previous research, RMR_{ratio} has been correlated with psychological variables traditionally associated with low energy availability, namely CR and DT. In our sample of young, exercising women, RMR_{ratio} using the ten Haaf & Weijs (2014) equation was most strongly correlated with CR and equally unassociated with DT when compared to four other equations. Future research using this equation within RMR_{ratio} analyses is warranted.