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MEASUREMENT OF RELATIVE ENERGY DEFICIENCY IN SPORT (RED-S) IN ELITE MALE ADOLESCENT ATHLETES

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Energy deficiency in adolescent athletes has been reported using energy availability calculations. More recently, the ratio of measured resting energy expenditure to predicted resting energy expenditure (REE/pREE < 0.09) has been used to explore relative energy deficiency in sport (RED-S) in adult athletes, however has not been applied in adolescent athletes. The aim of this study was to assess the suitability of REE/pREE in elite male adolescent athletes. Measured REE was measured using indirect calorimetry (QUARK RMR unit) and predicted REE was calculated using the Harris-Benedict, Cunningham, Schofield and Mifflin St Jeor predictive equations. Energy status was calculated using REE/pREE with < 0.9 deemed as energy deficient. No athletes presented with a relative energy (REE/pREE = 1.04; IQR: 0.96:1.1). Schofield’s equation was the closest predictor of measured REE (1,874 kcal (IQR: 1,515 kcal:1,989 kcal) vs. 1,965 kcal (IQR: 1,687 kcal:2,035 kcal). Harris-benedict, Cunningham and Mifflin St Jeor significantly underestimated measured REE at (mean ± SD) -1016 ± 1,045kJ, -1,249 ± 1045 kJ and -1,432 ± 1256 kJ, respectively (p = 0.001). The Schofield equation is the most suitable equation to identify RED-S using the ratio of REE/pREE in male adolescent athletes. Further research is required to explore the necessity of pubertal stages in REE predictive equations in this group to ensure accurate identification of relative energy deficiency.

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