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Research article

Energy Expenditure and Habitual Physical Activities in Adolescent Sprint Athletes

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ABSTRACT

This study aimed to assess total energy expenditure (TEE) and specific habitual physical activities in adolescent sprint athletes. Two methods used to estimate TEE, an activity diary (AD) and SenseWear armband (SWA), were compared. Sixteen athletes (6 girls, 10 boys, mean age 16.5 ± 1.6 yr) simultaneously wore a SWA and completed an AD and food diary during one week. Basal energy expenditure as given by the SWA when taken off was corrected for the appropriate MET value using the AD. TEE as estimated by the AD and SWA was comparable (3196 ± 590 kcal and 3012 ± 518 kcal, $p = 0.113$) without day-to-day variations in TEE and energy expended in activities of high intensity. Daily energy intake (2569 ± 508 kcal) did not match TEE according to both the AD and SWA (respectively $p < 0.001$ and $p = 0.007$). Athletes were in a supine position for a longer time on weekend days than on week days and slept longer on Sundays. Athletes reported a longer time of high-intensive physical activities in the AD than registered by the SWA on 4 out of 7 days. In addition to specific sprint activities on 3 to 7 days per week, 11 out of 16 athletes actively commuted to school where they participated in sports once or twice per week. The AD and the SWA are comparable in the estimation of TEE, which appears realistic and sustainable. The SWA offers an appropriate and objective method in the assessment of TEE, sleeping and resting in adolescent athletes on the condition that detailed information is given for the times the armband is not worn. The AD offers activity specific information but relies on the motivation, compliance and subjectivity of the individual, especially considering high-intensive intermittent training.

Key words: Indirect calorimetry, armband, exercise, sleep

Key Points

- The activity diary and Sensewear armband provide comparable estimates of TEE in adolescent sprint athletes.
- A high inter-individual variation was observed in time spent in high-intensity physical activities, advocating an individual based assessment when coaching athletes.
- The activity diary is useful when detailed information on specific physical activities is desired. The Sensewear armband offers objective information on sleeping, resting, and physical activity duration.
- Wearing the Sensewear combined with reporting on activities when the Sensewear is not worn and when doing specific activities of interest results in more complete information.

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