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Assessment of energy availability and factors associated with RED-S in weight-sensitive sports and weight class athletes during competitive season

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INTRODUCTION:
Relative energy deficiency in sport (RED-S) can negatively affect the health and performance of both male and female athletes. The underlying etiology of RED-S is low energy availability (EA), which occurs when there is insufficient dietary intake to meet exercise energy expenditure. The weight-sensitive sports and weight class athletes often having a high incidence of engaging in unhealthy nutrition and weight loss practices. Especially during the competitive season, weight-sensitive sports and weight class athletes reduce energy intake to achieve target body weight, changes in body composition occur due to fluctuations in energy expenditure and energy intake. LEA is when a higher training load is combined with low caloric intake so athletes are constantly in a state of calorie deficit. We aimed to assess dietary intake, energy expenditure, estimate EA, and assessed factors related to RED-S in weight-sensitive sports and weight class athletes during a competitive season.
METHODS:
In a cross-sectional design study design, twenty athletes from judo (n = 10), weightlifting (n = 3) and rowing (n = 7) were included in this study. We measured dietary intake (24 h dietary-record) and exercise energy expenditure (EEE, accelerometry) over 4 days, including 2 weekdays (with training) and 2 weekend days (without scheduled training). Furthermore, we assessed body composition, and bone mineral density (dual-energy X-ray absorptiometry) and venous blood variables. Paired t-tests were used to compare dietary intake, EEE, macronutrient and EA between weekdays and weekend days. Other data expressed using descriptive statistics.
RESULTS:
On weekdays, 90% of participants had an energy intake <30 kcal·kg·day−1, 20% had reduced EA (30-45 kcal·kg FFM·day−1), and 80% had low EA (<30 kcal·kg FFM·day−1). On weekend days, 69% of participants had an energy intake <30 kcal·kg·day−1, 62% had reduced EA (30-45 kcal·kg FFM·day−1), and 31% had low EA (<30 kcal·kg FFM·day−1). The EA was higher on weekend days (30 ± 15kcal·day−1) than on weekdays (18 ± 13 kcal·day−1; $p < 0.05$) because of the increase in EEE on weekend days. There were no differences in macronutrient consumption between weekdays and weekend days. Menstrual dysfunctions were reported in 22% of female participants. All participants had adequate bone health (Z-bone mineral density score: 1.6 ± 0.9), but 60% had concentrations of 25-OH vitamin D < 30 ng/ml, which is less than the levels of vitamin D deficiency.
CONCLUSION:
There is still a prevalence of low EA in weight-sensitive sports and weight class athletes during competition season, have a high-risk of developing RED-S due to weight restrictions. High energy consumption resulting from sports training during the competition season requires athletes to increase their energy consumption to prevent the prevalence of low EA. Therefore, strategies to support the health of athletes and the energy availability of training are essential to optimize training results and prepare for competition.

Topic: Nutrition

Presentation E-poster