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Effects of the FUEL Intervention on Menstrual Function in Competitive Female Endurance Athletes with risk of Relative Energy Deficiency in Sport

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INTRODUCTION:

Female endurance athletes are at high risk of menstrual dysfunction (MD) due to problematic (long-term/severe) low energy availability (LEA). MD has been associated with reduced bone health and performance in female endurance athletes, emphasizing the need for management of problematic LEA and associated conditions such as MD.

METHODS:

Female competitive endurance athletes from Norway (n=60), Sweden (n=84), Ireland (n=17), and Germany (n=47) were recruited to the Food and nUtrition for Endurance athletes – a Learning (FUEL) program consisting of 16 weekly online lectures and individual athlete-centered nutrition counseling every other week. Fifty athletes with symptoms of REDs [LEA in Females Questionnaire (LEAF-Q) score ≥ 8] and with low risk of eating disorders, with no use of hormonal contraceptives and no chronic diseases, were allocated to either the 16-week FUEL-intervention (n=32) (FUEL) or a 16-week control period (n=18) (CON). All but one completed the FUEL-intervention, while n=3 dropped out during CON. Athletes completed the LEAF-Q with menstrual function questions, at pre- and post-intervention/control period, and also at 6- and 12-months follow-up for the FUEL group. Menstrual function was analyzed in a descriptive manner, while group comparisons of LEAF-Q menstrual score from pre- to post, as well as within FUEL group comparisons for the four measurement time points, were conducted using a Bayesian mixed factor analysis of variance.

RESULTS:

Self-reported eumenorrhea increased from 10% (n=9 athletes) at pretest to 67% (20 athletes) at posttest in FUEL and decreased in CON from 73% (n=11) to 53% (n=8). Five of the 14 (36%) FUEL athletes, who reported MD at pretest, reported eumenorrhea at posttest. Seven (23%) FUEL athletes and three (20%) CON athletes were unaware whether they had normal menstruation at pretest. All FUEL athletes were able to define whether they had normal menstruation at posttest, while the number was unchanged for CON athletes. The number of athletes who reported reduced or absence of menstrual bleedings with increased training load decrease from 70% (n=21) to 47% (n=14) in FUEL while the number 73% (n=14) was unchanged in CON.

Changes in the LEAF-Q menstrual score from pre- to post did not differ between groups, as indicated by the lack of an interaction effect (FUEL: 6.6 ± 2.5 at pre- and 5.3 ± 3.0 at posttest versus CON: 5.1 ± 2.7 at pre- and 4.7 ± 2.3 at posttest, $B_{\text{Fincl}} = 0.664$). Six- and 12-months follow-up revealed strong evidence ($B_{\text{Fincl}} = 860$) for improvement in LEAF-Q menstrual score for FUEL athletes comparing all four measuring points (4.6 ± 2.6 at 6- and 5.1 ± 3.1 at 12-months follow-up).

CONCLUSION:

In this group of endurance athletes, participating in the FUEL intervention implies long-term improvement of menstrual function. The lack of long-term follow-up for the CON condition indicates, however, that the results should be interpreted with caution.

Topic: Nutrition

Presentation Oral

