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Self-reported symptoms of low energy availability among female elite athletes and controls

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INTRODUCTION:

Severe and/or long-term low energy availability (LEA) with and without eating disorders (EDs) is the underlying cause of the syndrome Relative Energy Deficiency in Sports (REDs) with multiple health (e.g., osteoporosis) and performance consequences (e.g., increased injury risk). We aimed to investigate symptoms of LEA among athletes and recreational active people, and the associations with EDs, excessive exercise, and motivation for training and dietary behavioral changes.

METHODS:

Swedish female national team athletes [Tier 4, (n=150)] from 26 sports, and recreational active women [Tier 1-2, (n=108)] 18-39 years were recruited via sport organizations and social media. Participants filled out an anonymous on-line survey comprising the LEA in Females Questionnaire (LEAF-Q) [variables; menstrual dysfunction (only scored in non-hormonal contraceptive users), gastrointestinal problems and sport injuries]. A total score > 8 was used as indicative of LEA symptoms. The Eating Disorder Examination Questionnaire (EDE-Q) (a Global score > 2.3 was used as indicative of symptoms of EDs), the Exercise Addiction Inventory (EAI), and the Motivation to Change Questionnaire (MCQ) were also included.

RESULTS:

Of all participants, 47.3% had symptoms of LEA [athletes 46.7% (LEAF-Q total score 11.5 ± 3.6), and recreational active women 48.2% (LEAF-Q total score 12.1 ± 3.8)]. Participants with LEA symptoms had a lower body mass (62.9 ± 9.4 vs. 66.3 ± 10.7 kg, $p=0.007$) and BMI (22.3 ± 2.9 vs. 23.4 ± 3.2 , $p=0.003$), while no differences were found in age (24.8 ± 5.3 vs. 25.3 ± 5.8 years, $p=0.389$) or training load (13.1 ± 5.5 vs. 13.5 ± 7.3 h/week, $p=0.676$) compared to those with no symptoms. Most of the participants with LEA symptoms (68.9%) did not have symptoms of EDs. However, when excluding those with symptoms of EDs, participants with LEA symptoms had higher scores of EDE-Q global (1.1 ± 0.6 vs. 0.8 ± 0.6 , $p=0.001$), dietary restraint (1.0 ± 0.9 vs. 0.6 ± 0.8 , $p=0.010$), shape- (1.8 ± 1.1 vs. 1.3 ± 0.9 , $p<0.001$), and weight concern (1.2 ± 0.9 vs. 0.8 ± 0.8 , $p=0.006$) compared to participants without LEA symptoms, as well as a higher EAI score (20.5 ± 3.6 vs. 18.7 ± 4.6 , $p=0.003$), and a perceived reduced ability to increase energy intake ($p=0.019$) and lower the training load ($p=0.006$).

CONCLUSION:

In the present study symptoms of LEA was equally frequent among elite athletes and recreational active women. Our findings confirm earlier indications that most LEA cases do not have EDs. However, our findings suggest that symptoms of LEA may still be associated with restricted eating and excessive training behaviors as well as focus on body shape and weight. Reversing LEA by increased energy intake or reduced training load or a combination is the only treatment to prevent REDs health and performance implications. Our findings therefore emphasize the need for multidisciplinary prevention and treatment strategies to ensure necessary dietary and training behavioral changes.

Topic: Nutrition

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