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Athletes with eating disorder symptomatology, a specific population with specific needs

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This review presents recent studies into the prevalence, process, treatment and prevention of eating disorders in athletes. Most prevalence studies showed that increased risk for athletes exists. Methodological challenges for future prevalence studies concern the choice of methods, measurements, categorization, and sampling. To determine why athletes are at increased risk, more prospective studies using multi-factorial models and multiple risk pathways are needed. Epidemiological risk factor studies, however, do not provide us with a true understanding of the eating disorder process. The narrative approach focuses on what an eating disorder means to an athlete, which might produce more relevant clues for interventions. More research attention should be dedicated to effective treatment and facilitating recovery. Finally, prevention should add attitudinal and behavioral interventions to the current knowledge-focused approach and programs needs to go beyond coaches and athletes to become more effective.

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Introduction

Research into disordered eating (DE) and eating disorders (ED) in sport has increased extensively over the past 25 years [1]. Early research predominantly focused on the heightened prevalence of ED symptomatology in female athletes, elites and weight-sensitive sport participants [2,3]. Prevalence of the entire spectrum of DE to ED vary from 0 to 19% in male athletes and from 6 to 45% in female athletes [4]. Systematic review of ED effects showed negative effects on both health and performance [5].

Much research has also been conducted into the reasons why athletes are at increased risk. Although actual 'risk' factors cannot be determined because longitudinal studies are lacking, the development of ED in athletes appears to be multi-factorial [4]. Within the multiple risk factors, predisposing, precipitating and perpetuating factors can be distinguished [4]. Where predisposing factors are determining variables, such as genetic heritability that make some individuals more susceptible to ED, precipitating factors are the circumstances that trigger disturbed eating, such as weight-related comments. Perpetuating factors are also known as maintaining or coping factors that keep the eating behaviors disordered [2,4]. Whereas effective prevention programs focus on causes and triggers, treatment interventions address maintaining factors.

This review will give an overview of recent study results on the prevalence, risk factors, process, prevention, and treatment of ED in sport.

Recent prevalence studies: to what extent are ED in athletes still a problem?

Although Papathomas and Lavallee [6] called for a reduction of 'the prevalence of prevalence studies' (p. 389), ED prevalence studies in sport are still present.

Findings of elevated ED risk were recently found in Norwegian adolescent elite athletes [7], Flamish adolescent aesthetic female athletes [8], US collegiate male and female lightweight rowers [9] and male wrestlers [10••], but not in US women collegiate athletes [11]. No prevalence differences existed between leanness and non-leanness sports, which contrasted with previous studies [7,12].

When interpreting these findings, several methodological comments are relevant. First, assessment type seems to make a difference. Underreporting of pathogenic weight control was found in a quantitative screening compared with clinical interviews [7]. Very few studies found evidence for the valid use of general ED measures in athletes [10••,13••]. Chapman and Woodman recommended that to identify DE in male athletes, one should focus on a desire for leanness rather than a drive for thinness, as men strive for less body fat and greater muscle mass [10••]. Moreover, male athletes' bulimic symptomatology

appears to be best explained by the extent to which they engage in actual muscularity and dietary behaviors [14].

Second, sport type classification seems to be very relevant for finding or not finding a higher ED prevalence. Thompson and Sherman [1] highlighted the limitations of the sport type classification into lean and non-lean sports that is typically used in ED research, as some sports have multiple body ideals (*e.g.*, jumpers and throwers within track-and-field), while other sports (*e.g.*, tennis) fit in both non-lean and lean categories. A review on DE in male athletes showed that when all 21 mass-dependent sports samples were considered as a homogenous group, athletes did not have more DE than non-athletes, while moderator effects emerged for wrestling [10••], but not for judo or martial arts [15,16,17].

The third methodological issue concerns sampling. Voelker *et al.* attributed the fact that female figure skaters were not more symptomatic to recent attention the Figure Skating Federation had paid to healthy nutrition. They also mentioned selection bias, in which the more positively treated and unaffected athletes and clubs were more willing to participate [12].

It seems safe to conclude that ED prevalence studies in athletes should be conducted more critically concerning methods, measurements, categorization, and sample selection [1,6,18,19].

The reasons that athletes are at increased risk: findings from etiological research

In an overview of ED risk factors in athletes, several general predisposing factors of biological (*e.g.*, genes), psychological (*e.g.*, body dissatisfaction) and sociocultural nature (*e.g.*, peer pressure) were distinguished [4]. Triggering factors appeared to be centered around negative body comments, while maintaining factors included approval and starvation effects [4]. Additionally, sport-specific factors such as dieting pressure, achieving personality, early specialization, traumas and injuries, coaching, and sport regulations were proposed [4]. It was concluded that multi-factorial risk models including general, sport- and gender-specific variables need to be developed [4]. Indeed, a 2-year longitudinal study showed that predictors of DE attitudes among male and female dancers were different [20•].

Recently, several ED-models were tested in athletes. One well-known general ED risk model is Stice's dual-pathway model of eating pathology. Data from an 8-year prospective study suggested one body dissatisfaction pathway to ED onset which was amplified by depressive symptoms, and one self-reported dieting pathway in girls who were more satisfied with their bodies [21,22]. This dual-pathway model is adjusted for athletes, emphasizing the additional risk of sport-specific pressures [23]. Voelker *et al.* confirmed the importance of targeting both pathways in female athletes at the beginning of an athletic season [24].

Shroff and Thompson [25] developed an etiological model stating that sociocultural influences contribute to the development of body-image and eating disturbances through the mediating roles of social comparison, internalization and body dissatisfaction, and several studies supported this [26,27,28,29].

Finally, the transdiagnostic model of Fairburn *et al.* [30] states that in certain patients ED is maintained through interaction of cognitive-behavioristic mechanisms with processes such as clinical perfectionism, low self-esteem, mood intolerance and interpersonal difficulties [30]. In athletes, sport-specific factors (*e.g.*, competitive anxiety) seem relevant in explaining ED too [31].

Instead of testing complete ED-models, several recent studies tested spare correlates, such as attachment styles [32], impression motivation [33], locus of control, and self-regulation [34]. Sport-specific risk correlates are: goal orientation and motivational climate [27,28,35], contextual body image [36,37], uniforms [38], coach communication [39], and sport pressure to be thin [40].

Several authors pointed out possible negative consequences of risk factor research [6,19]. Their major concern is that etiological approaches portray ED as an individual psychopathology rather than a multi-causal biopsychosocial phenomenon [6]. Such approaches could detract from sport pressures about what is appropriate in terms of weight and shape, and what is not [41•]. Furthermore, etiological studies do not lead directly to understanding of ED and do not give us insight in ED processes [6].

Insight in how and why athletes are at increased risk: findings from narrative inquiry

Opposite to etiological studies, the narrative inquiry approach focuses on the processes with which athletes try to make sense of what they experience [42]. This approach usually exists of storytelling, but also visual narrative methods such as drawing are used [43]. Papathomas and Lavallee [44] distinguished three emerging themes in athletes who suffered from DE: their struggle to disclose problems, social support needs, and identity challenges.

Several narrative studies concluded that athletes' DE experiences are often framed by a performance narrative, a dominant cultural storyline whereby only achievement leads to self-worth and self-identity [45,46]. Busanich *et al.* [46] recorded two opposing narratives in male and female distance runners. In the 'just do it' narrative, athletes run for health and fun benefits. In the 'just do

it better' narrative, athletes run for improving performance and demonstrating superiority, which was more likely to be accompanied by negative body experiences and unhealthy body-altering behaviors [46]. When elite athletic identity becomes threatened by moments of perceived failure, DE thoughts and behaviors may emerge [42]. When perceptions of achievement are low, athletes may construe self-starvation as a form of accomplishment [45] and eating as personal weakness [47]. Simultaneously, many athletes with DE use a dismissive narrative and try to distance themselves from their experiences [42,46]. The negative impact of how an ED is experienced is massive for both athletes and their surroundings [48•].

How do we treat athletes successfully?

The most important issue to address is helping athletes with DE more effectively [44,49]. Yet, treatment of athletes has gained little attention in research [1,44,49].

Anecdotal evidence shows that athletes regularly feel ambivalent towards therapy [44,50]. They may find it difficult to trust others with their DE symptoms, because they perceive a stigma to mental illness that contradicts their athletic identity and might even experience a discrepancy between their disordered-self and athletic-self [44]. Bulimia might be a threat to athletes who are afraid of being accused of lacking discipline. Additionally, because ED are viewed as a woman's disorder, male athletes may feel stigmatized, and motivated to hide their illness [16,42]. Commonly held gender stereotypes result in a lack of identification of ED in male athletes [16]. Coaches tend to attribute identification difficulties primarily to the athlete's failure to disclose themselves and resistance to interference rather than to their own personal shortcomings, coaching style or cultural explanations [51]. Previous experiences with ED and a close coach-athlete relationship seemed to facilitate early identification by coaches [1,51].

Arthur-Cameselle and Baltzell [52] highlighted advices from 16 recovered athletes to coaches, parents, and athletes with ED. The recovered athletes advised coaches to confront athletes when they suspect symptoms and to educate themselves [52]. They recommended parents to provide their children with more autonomy and emotional support [52]. Social support is regularly recognized as a recovery facilitator [53], but is often lacking [44].

Furthermore, affected athletes are advised to search for factors that triggered their ED as well as to maintain hope for recovery [52]. In a study among 47 recovered female athletes, the desire to become healthy enough to perform in sport has been identified as an important recovery facilitator [53]. The very same performance enhancement which appeared to be the main reason for athletes' dieting [36,54,55], also formed the catalyst that learned them to associate eating with personal strength again [45]. The recovered athletes also stressed the necessity of a shift in values and beliefs and developing new coping mechanisms [53].

These advices fit within the motivational interviewing (MI) approach, a recent advance in ED treatment. MI enhances the intrinsic motivation for behavioral change by giving autonomy to clients, encouraging reflection and ambivalence resolution, eliciting change talk, and amplifying the readiness for change and confidence in changing [56].

Only 17% of the recovered athletes mentioned therapy or intervention as the most important recovery facilitator [53]. Athletes often state that they feel misunderstood in treatment [44,50]. The narrative studies into actual DE experiences might provide us with the necessary sensitivity to the sport context and offer relevant clues to therapy [44].

How to prevent ED in athletes?

Athlete interventions

Selective, primary interventions with multiple targets and an interactive multimodal approach appear most effective for athletes [57•]. One example is a team-centered and peer-led 4-week ED prevention program for female dancers that led to more nutritional and overall DE knowledge and decreased mean scores on depression, maturity fears, body dissatisfaction, and drive for thinness [58]. Another successful intervention is the Female Athlete Body Project [59,60]. This evidence-based peer-led program successfully targeted thin-ideal internalization, dietary restraint, bulimic pathology, shape and weight concern, and negative affect. In a Norwegian school-based intervention program, including both first-year elite athlete students and coaches, results indicated that no new cases of ED had developed in the intervention group as opposed to 8 (13%) female athletes in control schools. Less positive results were found among men [61].

More insight into moderators, such as gender, might help us develop more effective interventions. Stewart *et al.* [60] investigated if sport type and base-line symptomatology moderated program response. They concluded that the distinction lean/non-lean sport may not play a strong role in determining response to efficacious programs, while higher baseline bulimic pathology scores predicted greater response to the intervention program at 6-weeks. In contrast, athletes with higher baseline scores for dietary restraint, shape concern, and negative affect showed decreased program responses.

In conclusion, we need more empirical studies examining the mechanisms of change in ED prevention programs

and prospective studies assessing the long-term impact of these programs in high-risk athletes [4,18,19,57•].

Interventions targeting involved others

Recently, several studies aimed to provide coaches with knowledge and tools for appropriate intervention. Selby and Reel developed a coach's guide with knowledge about ED, signals and signs, and adequate responses to suspected ED in athletes [62]. Martinsen *et al.* conducted a randomized controlled trial targeting coach knowledge and ED management strategies, which produced a significant long-term knowledge effect (sustaining at least nine months) and positive effects on the coaches' subjective evaluation of their ED knowledge [63]. Nowicka *et al.* investigated not only coaches' ED knowledge but also their early intervention skills and attitudes towards ED. Their interviews showed that coaches tend to minimize the issue of ED in athletes [64]. Likewise, Plateau *et al.* found that track-and-field coaches were only motivated to intervene when athlete performance was reduced [51]. Coaches seem to have insufficient capacity to identify ED and to conduct early intervention, which might lead to delayed treatment [64]. These studies make a clear case that prevention programs targeting coaches should move from knowledge to action.

If we effectively want to stimulate early intervention, the prevention approach should target not only athletes and coaches, but also others, such as support personnel and parents. It has been shown that, contrary to the coaches, support personnel did not seem to hold the individual athlete responsible, but instead highlighted environmental factors that potentially increased ED risk [65]. Lack of female coaching staff and limited referral possibilities [64] are among the proposed barriers to early intervention. Regarding parents, one study observed a protective parental effect on DE development [16], while others [66] found that parental concern with thinness and weight teasing was a predictive family variable: the parents seemed to follow, rather than correct, the critical aesthetic sports culture. In conclusion, it might be necessary to go beyond coaches and athletes and include the entire system to mobilize opposing forces and to change culture.

Conclusions and future research directions

When conducting ED prevalence studies in athletes, several recommendations can be made concerning methods, measurements, categorization, and sampling. If possible, quantitative screening should be combined with clinical interviews to avoid underreporting. In this respect, one should be aware of selection bias as unaffected athletes and clubs might be more willing to participate.

Concerning the choice of questionnaires, one should avoid general ED measurements that do not capture specific aspects of the athletic population. Instead, measurements should comprise sport-specific elements, such as a drive for muscularity, and should focus on actual behaviors. A contextual perspective on body image should be taken, in which both daily life and athletic body images are distinguished. In line with this, different sports should not be combined, as they might embrace different body ideals. Therefore, we might want to abandon the typically used sport type classification of lean/non-lean. Furthermore, different at-risk sports seem to follow different dynamics and processes leading to elevated ED risk. More prospective research into why certain athletes are at increased risk should be conducted and multi-factorial models including general, sport- and gender-specific risk factors and multiple risk pathways should be examined.

Narrative studies might lead to an even better understanding of the developmental route of ED. The narrative approach looks at the stories behind the figures. Insight into how athletes give meaning to actual ED experiences could underpin more appropriate interventions. It might offer therapists more sensitivity to the sport context, which is crucial as athletes often feel misunderstood and ambivalent towards treatment. More evaluation research into effective treatment of athletes and recovery facilitators is needed.

In sum, ED should be taken as a multi-causal biopsychosociocultural phenomenon and should be studied like that. Together with more insight into moderators and response predictors of interventions, this might lead to more effective prevention programs. For coaches, prevention should focus more on attitude, coach–athlete relationships, and ED management skills. Effective ED prevention should target beyond athletes and coaches, and include significant others, as well as a change of sport regulations, policy measures and health care system. Such an approach would really meet the specific needs of this specific population.

Conflict of interest statement

Nothing declared.

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