

Cita: Díaz, I., Godoy-Izquierdo, D., Navarrón, E., Ramírez, M.J., Dosil, J. (2018). Eating disorders in sports and football: An updated review. *Cuadernos de Psicología del Deporte*, 2,18, 45-56

Eating disorders in sports and football: An updated review

Trastornos de la conducta alimentaria en el deporte y en el fútbol: Una revisión actualizada

Transtornos do comportamento alimentar no esporte e futebol: Uma revisão atualizada¹

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RESUMEN

Los comportamientos alimentarios alterados y los trastornos de la conducta alimentaria (TCAs) tienen una alta prevalencia entre los deportistas tanto a niveles clínicos como subclínicos. Esta revisión resume y actualiza los principales hallazgos sobre TCAs en el deporte, con un énfasis en el fútbol, una modalidad ignorada en la que son comunes y más frecuentes de lo esperado. Comienza presentando los TCAs en el ámbito deportivo y su prevalencia. Se presenta la clasificación tradicional de los deportes como de "alto" y "bajo" riesgo y resultados recientes que cuestionan su utilidad y la de estimar la vulnerabilidad de los deportistas a partir de esta dimensión únicamente. Se comentan otros factores de riesgo más decisivos implicados en la predisposición, aparición y mantenimiento de los TCAs en deportistas, incluyendo factores socio-culturales, psicosociales, comportamentales y deportivos-contextuales. Se reflexiona sobre tendencias actuales en el deporte y en el fútbol que pueden contribuir a un incremento del riesgo de TCAs. Se proponen recomendaciones para la prevención y manejo de los TCAs en el ámbito deportivo. Finalmente, se comentan futuras áreas de investigación que pueden enriquecer nuestro conocimiento sobre esta área, incluyendo cuestiones metodológicas, empíricas y conceptuales que pueden generar importantes avances tanto en investigación como en intervención.

Palabras clave: Comportamientos Alimentarios Alterados; Trastornos de la Conducta Alimentaria; Factores de Riesgo; Prevención.

ABSTRACT

Disordered eating behaviours and eating disorders (EDs) are prevalent among athletes both at clinical and subclinical levels. This review briefly summarizes and updates the main findings on EDs in sports, with a specific focus on football, a largely ignored athletic modality in which EDs are common and more frequent than expected. We begin presenting EDs in sports and their prevalence. We review the traditional classifications of sports as "low-" and "high-risk" athletic modalities based on prevalence rates and examine recent findings that question the utility of classifying sports and estimating an athlete's vulnerability for developing an ED based only on such dimension. We then focus on other more decisive risk factors involved in the predisposition, precipitation and maintenance of an ED in sports, including socio-cultural, psychosocial, behavioural and athletic-contextual factors. We reflect on current trends in sports and football that may contribute to an increased risk for EDs. Next, recommendations for

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preventing and managing EDs in sports are discussed, stressing the importance of reducing putative risk factors. Finally, we attend to future areas of research that may enrich our knowledge on this topic, including methodological, empirical and conceptual issues that may lead to further advancements in research and intervention.

Keywords: Disordered eating; Eating Disorders; Risk Factors; Prevention.

RESUMO

Os comportamentos alimentares desordenados e os transtornos do comportamento alimentar (TCAs) têm uma alta prevalência entre os atletas em níveis clínicos e subclínicos. Esta revisão resume e atualiza as principais descobertas sobre TCAs no esporte, com ênfase em futebol, uma modalidade atlética amplamente ignorada em que os TCAs são comuns e mais frequentes do que o esperado. Começa com uma apresentação de os TCAs no esporte e sua prevalência. Revisamos as classificações tradicionais dos esportes como modalidades atléticas de "baixo" e "alto" risco com base nas taxas de prevalência e examinamos descobertas recentes que questionam a utilidade de classificar esportes assim e de estimar a vulnerabilidade dos atletas para desenvolver um TCA baseada apenas nessa dimensão. Para continuar, enfocamos outros fatores de risco mais decisivos envolvidos na predisposição, na precipitação e na manutenção de um TCA no esporte, incluindo fatores sócio-culturais, psicossociais, comportamentais e atléticos-contextuais. Refletimos sobre tendências atuais nos esportes e no futebol que podem contribuir para um risco aumentado para um TCA. Recomendações para a prevenção e manejo de TCAs nos esportes são propostas, destacando a importância de reduzir fatores de risco putativos. Finalmente, são discutidas futuras áreas de investigação que podem enriquecer o nosso conhecimento sobre esse tema, incluindo questões metodológicas, empíricas e conceituais que podem levar a avanços significativos em investigação e intervenção.

Palavras-chave: Comportamentos Alimentares Alterados; Transtornos do Comportamento Alimentario; Fatores de risco; Prevenção.

INTRODUCTION

Athletes are in a complex situation for preventing Eating Disorders (EDs) and managing the suffering from an ED (Díaz and Dosil, 2012; Dosil, 2008). They are continually pressured to have an "ideal body" for performance, i.e., to meet the specific requirements of their sport and improve their athletic success. Efforts to decrease weight and to change body composition (lean vs. fat mass) are often reinforced with an (initial) improvement in performance. This rewards their behaviour and serves as a positive feedback to mates, technicians and other people who are close to the athlete. However, in the long-term, consequences can turn deleterious for both performance and health. Moreover, athletes are constantly evaluated (by technical teams, judges

and referees, and fans or society in general) in reference to their appearance, weight and body and not merely on the basis of their performance (Sundgot-Borgen and Torstveit, 2010).

This review aims to briefly summarize and update the main findings on EDs in sports, with a specific focus on football, which is a largely ignored athletic modality in which EDs are common and more frequent than expected. This review is not a systematic one, but a comprehensive narrative review focused on the most relevant past and current findings so that its reading may help the researcher to gain knowledge on actual trends in this arena. We begin with a literature review on the prevalence of EDs in sports and include findings from Spanish and football samples. We review the traditional classifications of sports as "low-risk"

and "high-risk" athletic modalities based on the prevalence rates of EDs and examine recent findings that question the utility of classifying sports and estimating an athlete's vulnerability for developing an ED based only on such dimension. Then, we focus on several other risk factors that may have a more decisive influence on the risk for developing EDs, including socio-cultural, psychosocial, behavioural and athletic-contextual risk factors. We provide several reflections on current trends in sports and football that may contribute to an increased risk for EDs. All this allows us to gain a more complete picture of this area. Next, recommendations for preventing and managing EDs in sports are discussed, stressing the importance of reducing putative risk factors for developing subsequent disordered eating symptoms. Finally, we attend to future areas of research that may enrich our knowledge on this topic, including methodological, empirical and conceptual issues that may lead to further advancements in research and intervention. We hope that this updated review stimulates research on athletes and EDs and promotes interventions to enhance the successful management of EDs in the athletic field. It is important to note that this review is focused primarily on young and adult athletes, but EDs specifically in youth sports merits a similar attempt.

EDs in sports

EDs occur on a continuum that begins with weight and body concerns and moderately abnormal controlling practices (e.g., monitoring food intake, eliminating certain foods from the diet) that evolve into more negative beliefs and attitudes as well as dysfunctional eating and other weight-regulating behaviours (e.g., a restrictive diet, eliminating *acceptable* foods from the diet, using pills, laxatives or diuretics, "dietary doping", periods or cycles of binge eating and purging, fasting, induced vomiting, excessive physical activity), and ends with the eventual onset of clinically relevant symptoms (i.e., anorexia nervosa, bulimia, binge eating,

other eating disorders not otherwise specified - EDNOS) (Sundgot-Borgen and Torstveit, 2010). Bratland-Sanda and Sundgot-Borgen (2013) have affirmed that this continuum moves, in short, from *disordered* eating behaviours to eating *disorders*. Many athletes suffer from clinically relevant symptoms and can receive a diagnosis of an ED; many more have symptoms of an ED and use pathological weight control practices at subclinical levels.

Several reviews and meta-analyses have indicated that athletes, compared to non-athletes, have a higher relative risk for EDs and body image and body satisfaction disorders, both at clinical and subclinical levels (Bratland-Sanda and Sundgot-Borgen, 2013; Byrne and McLean, 2001, 2002; Currie, 2010; Currie and Morse, 2005; Hausenblas and Carron, 1999; Sundgot-Borgen and Garthe, 2011; Sundgot-Borgen and Torstveit, 2004, 2010). This occurs among both females (Beals, 2000; Morgado de Oliveira, de Abreu and Gonçalves, 2010; Smolak, Murnen and Ruble, 2000) and males (Baum, 2006; Glazer, 2008). Published prevalence rates estimate that up to 70% of athletes have disordered eating or EDs symptoms, with higher rates among high-performance and elite athletes, a figure that may have increased in recent decades (Sundgot-Borgen and Torstveit, 2010).

In Spain, a pioneer study by Pérez et al. (1992) indicated that, among 14-25 years old high-performance athletes from national teams, 13% could have an ED. The same rate was estimated for athletes who participated at lower performance levels and practitioners of exercise, while the rate among sedentary people was 5.5%. In addition, among athletes in weight-class sports (i.e., sports in which categories are established by weight requirements) the prevalence of an ED was three times higher (36%) than in other sport modalities (13%). The authors concluded that pressures such as continuous weight requirements and control increase the risk for EDs. Another study (Toro et al., 2005) indicated that 11.4% of Spanish female young elite athletes were at risk for an ED and

that the proportion of sufferers from any type of ED was 5.5 times higher than in the general population (22.6% vs. 4.1%). Moreover, the risk of suffering from bulimia was almost ten times higher (20.1%) than that of suffering from anorexia (2.5%). In addition, 50% of the athletes perceived themselves as fat and manifested concerns about their body and weight, despite having a normal BMI. More recently, Dosil, Díaz, Viñolas and Díaz (2012) examined a sample of 12- to 52-year-old Spanish high-performance athletes and found that 6.8% of the participants had a *very high* risk for developing ED symptoms (a score on the Athlete' Eating Habits Questionnaire [CHAD] higher than 120 points). Athletes who practiced sports that were categorized as "high-risk" for developing an ED had significantly higher scores, and there was a trend for higher rates among those who were older, who were in a higher performance category and who were professional athletes competing at international levels.

The athletic practice as a risk factor: from "low- " and "high-risk" sports to other risk factors. The case of football.

There is a multiplicity of socio-cultural, athletic, contextual and psychosocial factors that are involved in the predisposition, precipitation and maintenance of an ED in sports (Bratland-Sanda and Sundgot-Borgen, 2013; Díaz, 2014; Díaz and Dosil, 2012; Petrie and Greenleaf, 2007; Sundgot-Borgen and Torstveit, 2010; Thompson and Sherman, 2011). Risk factors in sports are not always consistent with those in the general population, but many are specific to the sport context (Torstveit, Rosenvinge and Sundgot-Borgen, 2008). Moreover, as Bratland-Sanda and Sundgot-Borgen (2013) highlighted, although many risk factors can be shared, athletes may be more vulnerable to them than non-athletes.

Thus, in addition to general factors that affect both athletes and non-athletes, attention has been devoted to specific risk factors, such as a) the practice of sports, performance requirements and the relationship between

performance and weight, body composition and body appearance; b) attributes of the activity, including weight or appearance requirements or frequent weight or diet control; c) social and athletic pressures, including pressure from coaches, for having a lean physique and an *ideal* body both in aesthetic and functional terms, overall and for the specific sport modality (i.e., specific *body paradigms*); d) athletic factors such as higher performance levels, an early involvement in sports, injuries or overtraining; and e) several factors that are related to athletes' personal and psychological characteristics (e.g., low self-confidence, poor self-esteem, high competitive anxiety), some of which are highly valued qualities among athletes (e.g., perfectionism). Therefore, athletes experience an intense pressure to have an *appropriate* body and weight and a low percentage of fat for their best performance as well as aesthetic reasons, which can increase their vulnerability for an ED.

For the vulnerability of developing an ED, athletes from some sport modalities are considered to be at a higher risk: when a low weight or a lean body appearance is preferable and continuous weight monitoring and control are important for aesthetic reasons, performance advantages or weight-based classification requirements; when body shape is manifest (e.g., clothes, muscularity); when aesthetic factors are valued; and when the athlete's performance is subjectively evaluated (i.e., judges vs. referees). Thus, it has been found that athletes from aesthetics, weight-class, resistance or anti-gravitation sports are at an increased risk for an ED compared to both non-athletes and other athletes (e.g., ball sports players) (Byrne and McLean, 2002; Carter and Rudd, 2005; Engel et al., 2003; Milligan and Pritchard, 2006; Reinking and Alexander, 2005; Sundgot-Borgen and Torstveit, 2004; Torstveit and Sundgot-Borgen, 2005; Torstveit et al., 2008). This difference between *high-risk* and *low-risk* sports due to the prevalence of EDs is emphasized in several reviews (e.g., Bratland-Sanda and Sundgot-Borgen, 2013; Currie, 2010; Díaz, 2014;

Sundgot-Borgen and Garthe, 2011; Sundgot-Borgen and Torstveit, 2010). Consequently, it has been stated that competing in sports that emphasize weight and body appearance, and not sportsmanship by itself, increases the risk for an ED (Byrne and McLean, 2002).

However, several empirical findings contradict previous ideas about EDs in sports and challenge the existing sport classifications into high- and low-risk modalities. Berry and Howe (2000) observed and warned that *all* athletes, regardless of sport modality, may suffer from an ED when risk factors are present. As such, no differences have been found in the vulnerability for and manifestations of EDs among athletes from high- and low-risk sports (e.g., Gomes, Martins and Silva, 2011; Greenleaf, Petrie, Carter and Reel, 2009; Hausenblas and Carron, 1999; Kirk, Singh and Getz, 2001; Sanford-Martens, Davidson, Yakushko, Martens and Hinton, 2005). Torstveit and Sundgot-Borgen (2005) found that female ball sports players had the highest prevalence of EDs and related disorders (53%) after athletes from aesthetic sports. Williams, Sargent and Durstine (2003) observed a high prevalence of ED symptoms among females who engaged in low-risk sports such as ball games, which was higher than that observed for some sports with an increased risk. Milligan and Pritchard (2006) found a higher prevalence of EDs and body dissatisfaction among women from sports that did not emphasize weight and thinness (e.g., basketball, tennis, soccer, golf) and among men who practiced high-risk sports (e.g., athletic sports, wrestling).

For EDs in football, there is limited empirical evidence due to the lack of research that includes football players as the main study group or as an isolated group that is compared to athletes from other sports. Although football is not included among high-risk sports for EDs based on the "official classification", there is increasing evidence that altered eating behaviours and EDs are frequent in this athletic modality. In their review, Dosil and Rodríguez

(2008, cit. Dosil, 2008) found that in sports such as soccer and indoor football, which are often viewed as low-risk, participants have high scores on instruments that assess the risk of a disorder related to eating behaviour and body image. The Norwegian research group led by Sundgot-Borgen have conducted several studies on EDs in ball sports including soccer and have concluded that there is a notable prevalence of EDs in these modalities: although 5.9% of athletes report having suffered from an ED, 24% of (female) players meet the diagnostic criteria for a clinically relevant disorder (Sundgot-Borgen and Torstveit, 2007). Goutteborge and colleagues in the Netherlands have also found that football players have unhealthy eating behaviours, with a prevalence of 26% to 58% among active athletes and 42% among retired players, which constitutes the most common mental health problem and pathological behaviours in this group of athletes (Goutteborge, Aoki and Kerhoffs, 2015; Goutteborge, Frings-Dresen and Sluiter, 2015). One study found a 53% prevalence rate for (unhealthy) disordered eating behaviours among Spanish footballers (Goutteborge, Backx, Aoki and Kerhoffs, 2015). Female footballers may be particularly at risk, with EDs prevalence rates similar to, or higher than, those found in high-risk sports (Sundgot-Borgen and Torstveit, 2007). Kirk et al. (2001) found a prevalence of EDs of 17% among female soccer players (faced with 11% among athletes in general). This rate followed that for a leanness-centred athletic modality and was similar to rates for other high-risk sports. Similarly, Williams et al. (2003) observed that 14.4% of female footballers had ED symptoms.

Studies conducted in Spain reveal that football players, both male and female, have risk factors for developing an ED (Díaz, 2014; Díaz and Dosil, 2012; Dosil, 2008). Dosil (2008) observed high scores on questionnaires that are used for detecting EDs, although that study did not seek to establish the incidence of EDs in this sport as football players were only included as a

control group. Díaz and Dosil (2012) also found EDs in sports that were not a priori high-risk sports, such as football. Concretely, female footballers, compared to athletes from several high- and low-risk modalities, were among those who obtained the highest scores on the CHAD and its dimensions. Similarly, men also scored high on the CHAD compared to other athletes. More recently, with the specific aim of detecting EDs among football players, Díaz (2014) surveyed a sample of male and female soccer players aged 14 to 34 years and found that 15.3% of the participants were at risk for developing an ED based on their scores on the CHAD (i.e., ≥ 100 points). Females had a higher global score, with 37.5% having a high risk for ED. Among men, 32% demonstrated a high risk. Senior male players had the highest scores. Further, participants had obsessive concerns about food and weight, along with a fear of gaining weight in resting periods and a high usage of unhealthy eating behaviours and excessive exercise as methods for weight loss.

Other risk factors for EDs in sports

Among socio-cultural risk factors, research highlights the current canons of beauty and their influence on athletes' beliefs and perceptions on weight and body shape (Petrie, Greenleaf, Reel and Carter, 2009a; Sundgot-Borgen and Torstveit, 2010). Athletes are immersed on a socio-cultural frame and consequently influenced by aesthetic ideals of body and appearance at a societal level, beyond athletic body ideals. Psychosocial risk factors include thoughts, attitudes, values and behaviours about food, weight and body image and their relationship to athletic performance and success, as well as social acceptance. Specifically, normative and personal beliefs about the body, weight and diet are important to athletes, due to their impact in both functional and performance as well as aesthetics terms (Haase, 2011; Petrie et al., 2009a). Athletes who believe they can improve their performance by regulating (decreasing) their weight are at a higher risk for EDs. In

addition, athletes with an increased risk for developing an ED are often concerned about their physical appearance and have poor body satisfaction, a drive for thinness or muscularity and high social physical anxiety (Berry and Howe, 2000; Bratrud, Parmer, Whitehead and Eklund, 2010; Engel et al., 2003; Gomes et al., 2011; Haase, 2011; Haase and Prapavessis, 2001; Haase, Prapavessis and Owens, 2002; Holm-Denoma, Scaringi, Gordon, Van Orden and Joiner, 2009; Krane, Waldron, Stiles-Shipley and Michalenok, 2001; Milligan and Pritchard, 2006; Petrie, Greenleaf, Carter and Reel, 2007; Petrie et al., 2009a,b; Reinking and Alexander, 2005; Rui, Martins and Silva, 2011; Schwarz, Gairrett, Aruguete and Gold, 2005). Public exposure of the body (e.g., contour-revealing clothing) appears to be crucial in this context because it is associated with poorer bodily perceptions and practicing unhealthy weight control strategies (Frideres and Palao, 2008). Additionally, when athletes believe that their teammates have problems related to eating and weight, it is more likely that they themselves suffer from an ED (Engel et al., 2003). A particularly interesting phenomenon is "competitive thinness" (Currie, 2010), which refers to comparisons of weight and body between teammates or sportmates.

Research has also emphasized pressure from coaches about diet, weight and body appearance (Engel et al., 2003; Frideres and Palao, 2008; Kerr, Berman and Souza, 2006; Petrie et al., 2007, 2009a; Rui et al., 2011; Williams et al., 2003). Coaches have an influence on athletes that can include controlling or reducing the athletes' weight and percentage of body fat or body shape, which may lead athletes to hold more negative attitudes and higher concern about weight and bodily perceptions and to employ unsuitable regulation methods that involve severe health threats (Ferrand, Magnan, Rouveix and Filaire, 2007). Similarly, athletes experience pressure from the rest of the coaching staff, teammates, family and friends (Dosil, 2008; Ferrand et al., 2007;

Frideres and Palao, 2008; Kerr et al., 2006; Petrie et al., 2007, 2009a; Williams et al., 2003). Athletes who have heard concerns about their weight from significant others are 3 times more likely to suffer from ED symptoms (Williams et al., 2003).

Moreover, it is not uncommon that athletes concede a greater importance to physical activity for improving weight and appearance than increasing fitness or health (Petrie et al., 2009b). Athletes often adhere, in addition to regulatory strategies involving diet, to abusive physical activity practices to control their weight and body appearance, particularly in the periods in which the burden of training and competition decreases. EDs and exercise dependence are closely related (Blaydon and Lindner, 2002; Hausenblas and Downs, 2002). Practices that involve excessive exercise are more common than others such as vomiting or using laxatives or diuretics, but they are as detrimental to the athlete's health and performance as the latter (Frideres and Palao, 2008; Greenleaf et al., 2009; Gutgesell, Moreau and Thompson, 2003; Petrie, Greenleaf, Reel and Carter, 2008; Sundgot-Borgen and Torstveit, 2007, 2010; Torstveit and Sundgot-Borgen, 2005; Williams et al., 2003). Athletes from weight-class and aesthetic sports are more likely to engage in risky behaviours related to eating and physical activity than those who practice endurance or ball sports (Chatterton and Petrie, 2013; Ferrand et al., 2007; Sundgot-Borgen and Garthe, 2011). In contrast, using pathological behaviours (e.g., appetite-controlling or slimming pills, laxatives, diuretics, vomiting) are more common among athletes who do not practice sports that have an emphasis on weight (Torstveit et al., 2008). Regardless of their nature, these practices can be exacerbated even after retirement, particularly among athletes who remain connected to the athletic activity (e.g., as coaches) (Stirling, Cruz and Kerr, 2012).

Current trends in sports and football for an increased risk of EDs

In football and sports in general, several current changes may explain the increased risk for EDs among practitioners, or equivalent rates to those found with other athletes, mainly athletes in high-risk sports. Although footballers usually have had a higher BMI than other athletes (Arroyo, González-de-Suso, Sánchez, Ansotegui and Rocandio, 2008; Petrie et al., 2008), Díaz (2014) indicates that today, footballers serve as aesthetic "models" based on their physical appearance, regardless of their athletic dedication. Thus, attention to the body and the image is part of the sport of football today. Further, the stereotype of the football player's body has changed (less weight, more muscularity) due to more stringent athletic requirements for endurance, strength, speed and agility. Moreover, both athletes and coaches regularly monitor weight, with athletic and economic sanctions when they find an *unexpected* weight. In many cases, this weight control is conducted without adequate nutritional counselling and with dieting practices that do not meet the needs of the athlete (Cole et al., 2005; Dunn, Turner and Denny, 2007). These adaptations may indicate that the risk factors for an ED are changing for football and that to properly prevent EDs, it is necessary to appropriately identify the relevant risk factors before the disorder develops.

Preventing and managing EDs in sports and football

Mental health in athletes, specifically football players, has been largely ignored and is often hidden by sufferers, e.g., athletes, technicians and clubs, because it is viewed as shameful. After several striking case examples, authorities have increased attention to this issue and are focusing on the mental well-being of the footballers, especially in relation to EDs. The International Union of Footballers (FIFPro) have launched several investigations to determine the players' risk for developing a psychological disorder, including mood disorders, anxiety, substance abuse and inadequate eating

behaviours, with the latter demonstrating the highest prevalence of all of the above-mentioned problems (Goutteborge, Aoki et al., 2015; Goutteborge, Backx et al., 2015). In addition, the prevalence of these problems is greater among both active and retired footballers compared to other groups of athletes and the general population (Goutteborge, Frings-Dresen et al., 2015).

EDs have a dramatic impact on the lives of athletes (Kerr et al., 2006; Papathomas and Lavallee, 2010). Their health, well-being and daily functioning can be seriously compromised (Sundgot-Borgen and Torstveit, 2007), as can their athletic performance (El Ghoch, Soave, Calugi and Dalle Grave, 2013) and their satisfaction with their athletic career (Goutteborge, Aoki et al., 2015). Moreover, EDs are associated with athletic injuries (Díaz et al., 2014), although an inverse relationship has been also found (Goutteborge, Aoki, Ekstrand, Verhagen and Kerkhoffs, 2016). Notably, these problems may occur very early in the athlete's career (Davison, Earnest and Birch, 2002) and tend to be maintained over time, with a higher prevalence and severity (Carter and Ruud, 2005; Goutteborge, Frings-Dresen et al., 2015; Papathomas and Lavallee, 2006).

Therefore, it is essential to launch efforts for primary, secondary and tertiary prevention of EDs. There are several guidelines for the prevention, identification and treatment of EDs in sports (e.g., Beals, 2004; Bratland-Sanda and Sundgot-Borgen, 2013; Currie, 2010; Díaz, 2014; Sundgot-Borgen and Torstveit, 2010). Preventive interventions must be based on an understanding of the relevant risk factors at the socio-cultural level (e.g., normative beliefs about food, diet and the body of athletes in general and in soccer players in particular, common practices among athletes), sports and contextual level (e.g., pressure from coaches, coaching style, peer relationships, family eating patterns) and personal level (e.g., comparisons with teammates, perfectionism, beliefs and practices in relation to food and weight). In addition, it is

important to consider the peculiarities of the sport and the particular demands that athletes have to face (Sherman and Thompson, 2001). Several useful interventions have focused on a proper education about nutrition and physical activity behaviours, information about their implications for health and athletic performance and a reduced emphasis on (low) percentage of fat and weight (e.g., Becker, McDaniel, Bull, Powell and McIntyre, 2012; Martinsen et al., 2014). The experiences of the athletes who have personally suffered from an ED can aid in the design of such interventions (e.g., Arthur-Cameselle and Baltzell, 2012).

Furthermore, coaches, because of their direct, continuous contact with athletes, must be considered a key element in the management of EDs, including risk reduction, early detection and early intervention. Coaches usually encounter EDs and may become involved in their identification, the athlete's care and attempts to reduce their consequences on the athlete's health and performance (Trattner, Thompson, Dehass and Wilfert, 2005). However, in many cases, coaches are not aware of their negative influence on their own athletes' EDs (e.g., they attribute the problem in general to coaches but not to themselves) (Heffner, Ogles, Gold, Marsden and Johnson, 2003; Kerr et al., 2006). Thus, to prevent EDs in sports, educational programs for coaches must be developed to improve their knowledge about disordered weight-related behaviours, EDs, healthy habits in sports and training and communication styles so athletes became protected against EDs (Díaz, 2005, 2014; Díaz and Dosil, 2012). An interesting approach involves identifying and increasing coaches' knowledge about EDs in sports and teaching the skills required for early detection and intervention with athletes who are both at risk and already suffering from an ED, to anticipate potential mental health problems and prevent a decrease in performance, as well as to enhance their perceived capacity in communicating their concerns to athletes (Goutteborge, Frings-Dresen

et al., 2015; Govero and Bushman, 2003; Harris, 2000; Pérez et al., 1992; Sánchez-Gombau, Vila, García-Buades, Ferrer and Domínguez, 2005; Turk, Prentice, Chappell and Shields, 1999). Fluid communication and cooperation between the athlete, the coach and the coaching staff and the team of health specialists attending the athlete must exist (Currie, 2010). Both research and applied practice would allow us to provide appropriate tools to coaches. This would also increase the low confidence that coaches report for managing EDs despite their direct experience with these disorders (Vaughan, King and Cottrell, 2004).

Some research avenues for the future

More research is needed to reach a full understanding and successful management of EDs in sports in general and football in particular. Several issues deserve more empirical attention to shape both future research and intervention efforts, and there is a chance for researchers to engage in this fascinating arena. Some of these avenues for future research are presented below to draw attention to some of the topics on which the existing research is limited.

The limited research on risk factors and EDs in general in the sport arena could be enriched by using a variety of research designs (e.g., prospective longitudinal studies will allow us to know the evolution of both risk factors and their contributions as well as of an ED -on the continuum from disordered attitudes and behaviours to clinically relevant symptoms-) and analytical techniques (e.g., structural equation modelling, analyses of indirect effects of mediation and moderation). Further, in their commentary on the research that is currently available on EDs in sports, Papathomas and Lavallee (2012) emphasize the need for a broader methodological plurality and stress that "researchers must begin to taper their nomothetic focus on prevalence and risk so that more attention can be afforded to idiographic approaches." (p. 389). In addition, they advocate for a focus on athletes who are usually ignored

due to their entailment in sports that have a low prevalence of EDs. Furthermore, because research on EDs in sports is primarily quantitative, using qualitative methodologies has recently been emphasized as a way to explore athlete's subjective experiences with EDs and to obtain a more comprehensive view of these disorders in sports (Papathomas and Lavallee, 2012).

The study of risk factors for EDs is crucial in the prevention and management of EDs. However, it is necessary to distinguish between risk factors that have a causal relationship to EDs and those that are merely correlates (or even consequences) of the problem (Bratland-Sanda and Sundgot-Borgen, 2013). Moreover, and importantly, research to date is focused on risk factors for EDs, but protective factors are equally relevant (Hausenblas and Carron, 1999); nevertheless, they have been largely ignored in the research on EDs in sports. Future research should concede equal importance to both risk and protective factors.

Finally, previous research indicates that female athletes have a higher risk for suffering from an ED, with an average rate of women to men of 2-3:1 (Bratland-Sanda and Sundgot-Borgen, 2013; Sundgot-Borgen and Torstveit, 2004, 2010). This pattern has also been found with Spanish athletes (Dasil et al., 2012). Nonetheless, a change in the pattern of EDs in men, among whom there are increasing incidence and prevalence rates, may be currently occurring (Baum, 2006; Bratland-Sanda and Sundgot-Borgen, 2013; Glazer, 2008). Research should emphasize studying gender issues in EDs in sports and the possible interaction of gender with the sport modality, as well as differences in risk factors between sexes (Bratland-Sanda and Sundgot-Borgen, 2013). For football, research with Spanish football players do not support divergences between genders but, rather, similar rates for males and females (Díaz, 2014). Furthermore, in a traditionally male game such as football (Harris, 2005), it is critical to explore

women's perceptions and experiences and understand the role of gender.

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