


Prevalence of eating disorders on male team sports players

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ABSTRACT

Objective To determine the prevalence of EDs in national adult male team sports players.

Methodology An observational study was conducted with 124 football, rugby, volleyball, handball, water polo, baseball and hockey players ranging between 18 and 55 years old. All subjects signed the informed consent before participating in the study. Data were collected via an online form including four validated questionnaires: The Eating Habits Questionnaire for Athletes, the Eating Attitudes Test (EAT-40), the Eating Disorders Inventory-2 and the Body Shape Questionnaire. Data analysis was conducted with the software IBM SPSS V.23.0.0.

Results 18.5% of the population presented a clinical profile compatible with an ED diagnosis. We cannot confidently say that the prevalence of EDs within our sample is conditioned by the analysed variables.

Conclusion Male team sports players may also be a high-risk group in the development of EDs. Risk factors such as young age, semiprofessional sporting status and body fat composition could influence its development.

INTRODUCTION

Eating disorders (EDs) are classified as a mental illness, and they are defined as a set of psychological disorders that generate dysfunctional attitudes, behaviours and strategies regarding food intake or absorption.^{1 2}

In general terms, EDs are characterised by an unusual concern about body weight and body image that can become the focus of daily life, reducing the interest in other aspects of life. Thus, EDs are a threat to the physical and psychological well-being of the person, leading to physical illness or even death.¹⁻⁴

Furthermore, in the case of athletes, it is known that the physical imbalance derived from an ED can be even worse due to the regular practice of physical exercise with low availability of energy and nutrients.⁵⁻⁹ Furthermore, the development of an ED in these subjects will drastically alter their performance, with psychological and social consequences.^{2 6-9}

However, the prevalence of EDs in sport is not yet known,^{2 4 7 8 10-18} although it is known that the risk of EDs is higher than in the general population. In this sense, scientific evidence showed that the prevalence

Key messages

What is already known?

- ▶ Male team sports players are not considered a high-risk group in the development of eating disorders (EDs)
- ▶ EDs risk factors are not met into male team sports players populations

What are the new findings?

- ▶ Male team sports players may be a high-risk group in the development of eating disorders (EDs).
- ▶ Young age, semiprofessional sporting status and body fat composition could influence the EDs development within male team sports players populations.

of EDs is higher in females, adolescents and athletes-competing in aesthetic sports, weight categories, gymnasium and endurance.^{2-4 9 10 13 14 16 19-22}

Therefore, men practising team sports are usually excluded from the population considered at high risk for ED development.^{2 4 10 13 14 16 19-21 23 24} This exclusion may be questioned based on the following considerations: (1) current information regarding EDs in sports is insufficient, especially in the case of male team sports players^{2 8 12}; (2) several investigations warn about a potential underdiagnosis of EDs in men^{23 25-29}; (3) there is previous evidence of relevant concern regarding body image in team sports players and there are previous studies that do not find differences in the risk of EDs between these and other athletes generally accepted to be at high risk of these pathologies^{11 30 31} and (4) it is not yet known with certainty whether the team acts as a protective factor or as a risk factor for the development of EDs.^{14 32}

Therefore, this research is proposed to determine the prevalence of EDs in men who practise team sports.

MATERIAL AND METHODS

An observational study has been carried out with a sample of 124 subjects. The inclusion criteria have been: being male, practising



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some team sport and being federated in Spain. Those under 18 or over 55 years old, those who did not give express consent to their participation or those who made mistakes when completing the requested documentation were excluded from the sample.

Data collection was carried out between January and March 2020. First, all the Spanish team sports federations and their main clubs were contacted by email. The purpose of the investigation was explained to them and the criteria that athletes had to meet to participate in the investigation. In addition, the URL to an online self-administered form was sent to them to distribute it among the players that met the criteria. The highest possible degree of distribution was requested.

At the same time, participation in the research was requested through direct contacts, through the public display of informational posters and the main social networks. Again, the maximum possible circulation was encouraged.

The self-administered form was available via the *Google Forms* platform, and it included the first sheet of general assessment (age, weight, height, body fat, amount of training, played sport, position within the team and competition level) and the following validated questionnaires for the detection of EDs:

- ▶ Athlete's Eating Habits Questionnaire (CHAD). Currently, it is the only screening questionnaire valid, reliable and specific for detecting EDs in the sports field available in the Spanish language (Alfa Cronbach=0.93). A score greater than 100 indicates a potential ED.¹⁴
- ▶ Eating Attitudes Test (EAT-40). This test was selected for being one of the questionnaires with the most evidence in detecting symptoms compatible with anorexia nervosa (Cronbach's alpha=0.93). A score higher than 21 is compatible with the presence of anorexia nervosa.^{14 33 34}
- ▶ Eating Disorders Inventory (EDI-2). This test was included to evaluate the typical cognitive-behavioural characteristics of anorexia nervosa and bulimia nervosa (Cronbach's alpha=0.90–0.94). A score higher than 105 warns about the potential presence of some ED.^{49 14 33 35–37}
- ▶ Body Shape Questionnaire (BSQ). This test was specifically included to assess concern and perception of body image. Its reliability is guaranteed by a Cronbach's alpha of 0.93–0.98. A score greater than 110 could indicate ED.^{14 19 38–41}

In an attempt to counteract the under-diagnosis declared in previous investigations with men,^{23 25–29} all the four described questionnaires were included providing a more in-depth evaluation.

All participants had the opportunity to contact the main researcher to answer queries about the content or working of the evaluation tools.

The data collected was anonymised to comply with Spanish Organic Law 3/2018, of December 5, on the

Protection of Personal Data and Guarantee of Digital Rights.

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

The data analysis was performed using the statistical software IBM SPSS V.22.0.0. First, the normality of the sample was tested using the Kolmogórov-Smirnov test, which indicated an abnormal distribution in all the variables ($p < 0.05$). Consequently, descriptive non-parametric statistics (mean and IQR) were calculated. The prevalence of EDs was determined considering as positive any subject with scores above the cut-off in at least one of the four used questionnaires. Finally, the χ^2 test was performed to evaluate the influence of the different variables on the prevalence of EDs. For this test, the variables were distributed into groups as follows: age (<25, 25–34 and ≥ 35), body mass index (BMI) (<24.9 and ≥ 25), body fat (<8, 8–20, 20–25 and > 25), sports modality (football, rugby, volleyball, handball and others), level of competition (amateur, semiprofessional and professional), playing position (attacker and defence) and training volume (<12 and ≥ 12 hours).

RESULTS

Participants

Initially, data were collected in 148 records that met the inclusion criteria. However, after applying the exclusion criteria, the final sample was made up of 124 subjects. In all cases, the exclusion was due to the existence of multiple participations by the same subject.

Description of the sample

Table 1 shows the descriptive statistics (median and IQR) of the sample used. Furthermore, in figure 1, the sample

Table 1 Sample characteristics

	N	Q1	Median	Q3
Age (years)	124	21	25	30
Weight (kg)	124	73.0	81.0	90.0
Height (cm)	124	176.2	181.0	187.0
Body mass index	124	22.6	24.4	26.6
Body fat (%)	97	10.0	13.6	19.7
Training volume (hours/week)	124	5.2	8.0	10.0
CHAD score (cut-off point=100)	124	59.2	74.5	91.0
EAT40 score (cut-off point=21)	124	6.2	9.0	13.0
EDI2 score (cut-off point=105)	124	20.0	28.0	43.0
BSQ score (cut-off point=110)	124	42.0	52.0	71.0

BSQ, Body Shape Questionnaire; CHAD, Athlete's Eating Habits Questionnaire; EAT40, Eating Attitudes Test 40; EDI2, Eating Disorders Inventory 2.

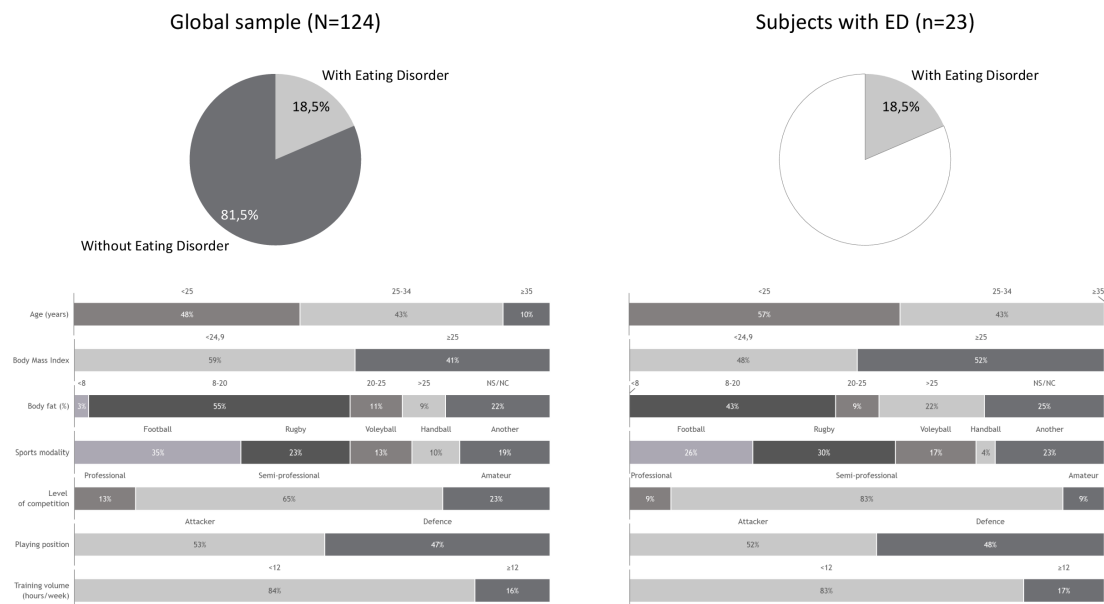


Figure 1 Sample's and clinical subsample's distribution. ED, eating disorder.

distribution can be observed according to the different variables.

Determination of the prevalence of EDs in the studied sample

According to the data analysis, 18.5% of the sample provided a clinical picture compatible with the existence of one ED (see table 2).

Evaluation of the influence of the different variables on the prevalence of EDs

As shown in table 3, the χ^2 test did not show statistically significant differences when analysing the existence of EDs in the different groups of each of the studied variables ($p > 0.05$).

DISCUSSION

18.5% of the study participants show symptoms compatible with the existence of one ED.

The prevalence of EDs is similar to the 14% observed by Baldó-Vela and Bonfanti¹¹ when studying 49 semi-professional basketball, soccer and rugby players aged 18–35 through the CHAD, EAT-40, EDI-2 and BSQ questionnaires. On the contrary, it is much higher than the 2.4% found by Teixidor-Batlle *et al*²⁴ and the 9% identified by Samar and Togay Unaldi²⁵ when using the EAT-26 questionnaire in a sample of 165 men aged 12–56 who practised some ball sport in elite categories

and a sample of 79 male handball players aged 10–49, respectively.

The lower prevalence observed in the studies by Teixidor-Batlle *et al*²⁴ and Samar and Togay Unaldi²⁵ in contrast to the present investigation could be due to the methodology used in the studies mentioned above, a fact that could have caused an under-diagnosis that other authors have already warned about when studying the prevalence of EDs in men.^{23 26–30} The EAT-26 is a validated questionnaire for detecting EDs mainly focused on the obsession with thinness and the preoccupation with food. However, in men with ED, the body concern is not usually focused on thinness. It is common for them to control their bodies through compulsive physical exercise and not through food restriction. In addition, it is a questionnaire that has not been validated in the sports population, a fact that disregards the recommendations given by other investigations to forego the heterogeneity of the prevalence results of EDs in the sports field.¹¹ At the same time, the differences in the level of competition of the studies samples with respect to those used in the present investigation could also explain the contrast in prevalence since, as reflected in this and other studies,¹⁰ players of the highest level of competition have lower EDs prevalence rates compared with semiprofessionals.

Table 2 Percentage of subjects with scores above cut-off point in questionnaires CHAD, EAT40, EDI2 and BSQ

	One or more questionnaires	CHAD	EAT-40	EDI-2	BSQ
% Subjects with scores >cut off point	18.5	15.3	7.2	0.8	4.0

BSQ, Body Shape Questionnaire; CHAD, Athlete's Eating Habits Questionnaire; EAT40, Eating Attitudes Test 40; EDI2, Eating Disorders Inventory 2.

**Table 3** Pearson χ^2 test results

	Pearson χ^2 test		
	Value	df	Asymptotic significance (bilateral)
Age (years)* EDs	3,2	2	0,2
Body mass index* EDs	1,4	1	0,2
Body fat (%)* EDs	7,2	4	0.06
Sport modality* EDs	2,8	4	0,6
Level of competition* EDs	4,2	2	0,1
Playing position* ED	0,1	1	0,9
Training volume (hours/week)* ED	0,3	1	0,8

ED, eating disorder.

On the other hand, it is found that the prevalence of EDs shown in the present investigation is higher than the 5.1% found by Kampouri *et al*¹⁵ when evaluating 129 women aged 18–40 who practised basketball, volleyball and water polo in elite categories. This finding suggests that federated team sports players are more vulnerable to EDs than women who practice such sports, a population traditionally considered at high risk for EDs.^{3 4 9 10}

At the same time, the prevalence of EDs observed in this study (18.5%) is similar to the 25% found by Martinsen and Sundgot-Borgen⁴² in a sample of 611 adolescent athletes. This fact suggests that the risk of EDs in men who practice a federated team sport is similar to that attributed to adolescence, a high-risk characteristic for developing this type of pathology.^{3 4 9 10}

In the same way, the prevalence found (18.5%) is similar to the 19% reported by Filaire *et al*⁴³ in a sample of 71 women athletes of modalities considered especially risky for the development of EDs.^{2-4 10 11 14 15 17 20-23 44} Likewise, the prevalence found is similar to 15% observed by Barrientos-Martínez *et al*⁴⁵ in a sample of 169 gym users aged 15–48 years, this being a higher risk when it comes to EDs.^{2-4 9 10 13 14 16 19-22} Thus, it seems that federated team sports players would have a similar risk to that associated with practising other modalities considered in high risk of EDs.

According to what has been described, the prevalence of EDs in men who practice a federated team sport could be similar to that found in other populations traditionally considered at high risk for this type of pathologies: women, adolescents and athletes of aesthetics, resistance, gymnasium and weight categories. This fact could be justified by the existence of higher levels of stress associated with competition due to the fan and media pressure that men team sports have. Added to this is the increase of social pressure towards the body shape,^{3 10 13 14} the increasingly close relationship between sport and thinness^{10 13 14 19} and

the lower ability that men have to manage stress and anxiety.^{30-41 46-48}

In this regard, according to the results provided by the test χ^2 (see table 3), we cannot say with certainty that the prevalence of EDs is determined by the analysed variables ($p>0.05$). However, according to our observation of the results and the available scientific evidence, the variables of age, level of competition, BMI and body fat composition could influence the development of EDs. The absence of statistical significance in the correlation between these variables and the development of EDs could be explained by the insufficient sample size for the subgroups analysis.

Regarding age, considering the highest representation of subjects under 25 and the disappearance of those over 34 in the clinical subsample (see table 3 and figure 1), it seems that the risk of EDs is higher in younger players. This finding has already been endorsed by other investigations.^{3 4 9 10} It could be justified by the corporality and group pressure typical of youth, a fact that would imply a greater concern for reaching the current aesthetic stereotype and, therefore, an increased risk of developing an ED.⁴⁹

Regarding the level of competition, if we observe the higher representation of semiprofessional players in the clinical subsample with respect to the global sample (see figure 1), it seems that those who compete at this level could be particularly vulnerable to EDs. This finding was already pointed out by Baldó-Vela and Bonfanti¹¹ in line with other investigations. It could be justified by greater pressure from the intermediate categories to reach the highest level of competition without having all the material and economic resources necessary to it. Furthermore, the loss of performance associated with EDs^{2 6-9} would also justify a lower prevalence in the elite categories.¹⁰

In the same line, about the relation between BMI and the percentage of body fat with an ED, we observe a greater representation of players with a BMI ≥ 25 and body fat percentage ≥ 25 in the clinical subsample. This finding suggests that subjects with higher adipose tissue could have a greater risk of developing an ED. This discovery has already been pointed out by other investigations.^{11 50 51} It could be the consequence of greater body dissatisfaction due to the discrepancies between the leanest bodies and the established aesthetic ideal.^{14 39 47}

Finally, it is important to analyse the lack of coherence between the results given by the four questionnaires used in this study to detect EDs (see table 2). In this sense, the CHAD was the only questionnaire in which most subjects of the clinical subsample scored above its cut-off point. This fact could be justified because the CHAD is the only questionnaire specific for athletes and validated in men. However, the rest of the questionnaires, despite having a great background in the clinical field and research, focus their attention on EDs symptoms that are unusual in most EDs cases in men

(food deprivation, lower body shape dissatisfaction and pursuit of thinness), although these EDs characteristics can appear in some cases. Therefore, specific and comprehensive questionnaires for male athletes are needed to avoid EDs underdiagnosis, a risk pointed out by several studies.^{23 25–29}

In summary, the findings described above provide a new indication that men who practice a federated team sport, despite having been excluded from the populations considered especially vulnerable to EDs,^{2 4 10 13 14 16 19–21 23 24} could constitute a high-risk group for this type of pathology. This finding highlights the need to modify the current classification of ED risk groups within the sports field and develop and implement specific prevention, early detection and treatment actions in the studied group. In this sense, it seems that special attention should be paid to younger players, semiprofessional categories and players with BMI ≥ 25 or body fat percentage 25.

However, the sample size has not reached statistical representation, requiring further research with larger samples. In this sense, to encourage the participation of the target population, it would be advisable to achieve a brief methodological tool. Furthermore, the lack of coherence between the results given by the four validated questionnaires to detect EDs (see table 2) highlights the need to create specific tools for male athletes to avoid underdiagnosis.

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