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# A comprehensive model of disordered eating among aesthetic athletic girls: Exploring the role of body image-related cognitive fusion and perfectionistic self-presentation

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## Abstract

The incidence of disordered eating among athlete populations is considerably higher than in the general population. Less well understood is the body image-related emotional processes that might lead to disordered eating attitudes and behaviours, specifically among aesthetic athletic girls. Thus, the aim of the present study was to explore the role that body image-related cognitive fusion plays in disordered eating, and the mediating role of body image-related perfectionist self-presentation on this relationship, in aesthetic athletic girls.

This study comprised 142 young female athletes from aesthetic sports, who completed self-report measures. A path analysis was conducted to explore the proposed theoretical model, while controlling for age and zBMI. The path model revealed an excellent fit and explained 71% of the severity of disordered eating. Results showed that body image-related cognitive fusion influences disordered eating behaviours, through the mechanism of body image-related perfectionist self-presentation, even when controlling for age and zBMI.

Findings suggested that, in aesthetic athletic girls, the entanglement in body image-related thoughts may be associated with the need to present a perfect body image to others, which may lead to disordered eating attitudes and behaviours, adopted as a means to control weight and body shape. The present study highlights the relevance of body image-related processes in disordered eating and suggests the importance of educational programmes that target the development of more adaptive emotion regulation strategies concerning body image in athletes, particularly from aesthetic sports.

*Keywords:* young athletes; disordered eating; body image-related cognitive fusion; body image-related perfectionist self-presentation.

## Introduction

1 Sports participation is widely recognized as a health promotion strategy (World Health  
2 Organization, 2011), due to its association with physical, psychological, and emotional  
3 well-being (Bartholomew et al., 2005; Lee et al., 2018; Vella et al., 2019). Nonetheless,  
4 some studies have suggested that athletes are at higher risk of presenting eating disorder  
5 symptoms, when compared to non-athletes (Giel et al., 2016; Krentz & Warschburger  
6 2013). Even in subclinical forms, these types of difficulties are characterized by a  
7 significant level of physical, psychological, and social impairment (Petrie & Greenleaf,  
8 2007). Several studies suggest that some conditions associated with sport context might  
9 put athletes, especially female athletes, at risk for the development of disordered eating  
10 attitudes and/or behaviours (Kerr et al., 2006).

12 For athletes, the body is the vehicle to perform and to achieve in sports (Byrne & McLean,  
13 2002). Especially in sports that emphasize leanness and weight, body image has a crucial  
14 role in achievement, which might put significant pressure on athletes concerning their  
15 body, weight and eating behaviours (Byrne & McLean, 2002). In the case of aesthetic  
16 sports, physical appearance is especially viewed as having an impact on performance  
17 (Sundgot-Borgen et al., 2013; Thomas et al., 2005). In aesthetic modalities (such as  
18 gymnastics, artistic skating, classic ballet, and dance), athletes tend to believe that “thin  
19 is going to win” (de Bruin et al., 2007). Particularly in adolescence, this mindset seems  
20 to be associated with body image-related difficulties and with the adoption of unhealthy  
21 weight control strategies (Currie, 2010; Kong & Harris, 2015). Indeed, adolescence is  
22 marked by a certain vulnerability to emotional difficulties, which is related to the  
23 physical, physiological, psychological, and social changes that characterize this  
24 developmental period (Robins et al., 2002). For these reasons, there has been an increased

1 interest concerning the body and eating attitudes in young athletes, especially aesthetic  
2 athletes.

3 Several studies have shown that aesthetic athletic girls tend to report high levels of  
4 disordered eating (Sundgot-Borgen et al., 2013; Tiggemann et al., 2000; Voelker & Reel,  
5 2018). Duffy (2008) suggested that competitive gymnastic girls may engage in disordered  
6 eating behaviours in order to change their physical appearance and to appear physically  
7 perfect to others.

8 Perfectionist self-presentation is defined by Hewitt and colleagues (1995) as a  
9 maladaptive self-presentational style that reflects the need to appear perfect to others.

10 There is now a consistent body of evidence that associates perfectionistic self-  
11 presentation with body image dissatisfaction and pathological dieting (Cockell et al.,  
12 2002; Hewitt et al., 1995; McGee, et al., 2005). Nevertheless, empirical studies that  
13 examine the relationship between perfectionist self-presentation and disordered eating in  
14 female aesthetic athletes, have provided inconsistent results (Duffy, 2008; Heller, 2013).

15 Since body image is an important issue in sports, especially in aesthetic sports, the need  
16 to present a perfect physical appearance seems to be particularly relevant in this context.

17 According to Ferreira and colleagues (2016), body image-related perfectionist self-  
18 presentation (defined as the need to present a perfect physical appearance to others) is  
19 positively linked with depressive symptomatology (Marta-Simões & Ferreira, 2016) and  
20 with disordered eating (Ferreira et al., 2016; Ferreira et al., 2017; Ferreira et al., 2015).  
21 Nevertheless, body image-related perfectionist self-presentation remains unexplored in  
22 aesthetic athletes.

23 Eating psychopathology has been considered an illness of psychological inflexibility  
24 (Merwin, 2011), intrinsically linked to cognitive fusion (Ferreira et al., 2014; Hayes &

1 Gifford, 1997). Cognitive fusion is an emotional process that refers to an excessive  
2 attachment to the content of one's thoughts, which are perceived as facts, rather than  
3 subjective and transitory interpretations of reality (Gillanders et al., 2014). This emotional  
4 process may occur in relation to a specific domain, like body image (Ferreira et al., 2015).  
5 When this happens, individuals tend to get entangled with disturbing body image-related  
6 inner events, assuming them as unquestionable facts, instead of experiencing them as  
7 subjective and transitory events (Trindade & Ferreira, 2015). Research has shown that  
8 body image-related cognitive fusion is strongly associated with disordered eating and  
9 seems to be a good predictor of eating disorders (Ferreira et al., 2014; Melo et al., 2019;  
10 Scardera et al., 2020; Trindade & Ferreira, 2014; Trindade & Ferreira, 2015;). In fact,  
11 body image-related cognitive fusion may foster maladaptive efforts to avoid or control  
12 these unwanted experiences (Trindade & Ferreira, 2014). Nonetheless, the specific  
13 impact of body image-related cognitive fusion in athletes (namely from aesthetic sports)  
14 on disordered eating attitudes and behaviours was never examined.

15 Studies have shown that athletes from aesthetic sports tend to demonstrate more  
16 disordered eating (such as pathological diet) (Giel et al., 2016; Krentz, & Warschburger,  
17 2013). However, it remains unclear which body image-related emotional processes are  
18 involved in this relationship. Therefore, the main aim of this study was to clarify the  
19 relationship of body image-related cognitive fusion with disordered eating in aesthetic  
20 athletic girls, and whether body image-related perfectionist self-presentation acts on this  
21 association. It was hypothesized that athletes from aesthetic sports who struggle with their  
22 thoughts regarding body image may engage in disordered eating attitudes and behaviours  
23 partially due to a need to present a perfect body image to others.

24

25

## Methods

## 1 *Participants*

2           The sample of this study comprised 142 Portuguese young female athletes of  
3 aesthetic sports from gymnastic ( $n = 50$ ), skating ( $n = 40$ ) and dance ( $n = 52$ ), with ages  
4 ranging from 12 to 18 years old ( $M = 13.97$ ;  $SD = 1.67$ ). Regarding their years of  
5 education, participants presented an average of 9.18 ( $SD = 1.76$ ).

6           All participants are active in their sport and presented a mean of 6.3 ( $SD = 3.55$ )  
7 years of sport practice. Participants reported an average of 4.5 ( $SD = 3.84$ ) hours of  
8 training per week. Concerning body mass index (z scores), 7 participants (4.9%) were  
9 underweight, 98 (69.1%) had a normal weight, 29 (20.4%) presented as overweight and  
10 8 (5.6%) presented obesity.

## 12 *Materials*

13 Participants reported demographic data (sex, age, education level, current height, and  
14 weight), sports data (type of sport, years of practice and hours of training per/week) and  
15 completed the Portuguese validated versions of the following instruments:

16 *Body Mass Index z Scores (zBMI)*. Participants' BMI z scores values were calculated by  
17 macros available by the World Health Organization (WHO; Onis et al., 2007) to analyse  
18 growth data for the age group among 5-19 years, through weight and height provided by  
19 the athletes.

20 *Cognitive Fusion Questionnaire Body Image (CFQ-BI; Ferreira et al., 2015)*. CFQ-BI is  
21 a 10-item self-report measure designed to assess body image related-cognitive fusion  
22 (e.g., "I struggle with my thoughts related to my body or physical appearance").  
23 Participants are asked to rate their accordance with each statement using a 7-point scale

1 (1 = “Never true” to 7 = “Always true”), with higher scores indicating a higher level of  
2 cognitive fusion. The CFQ-BI presented an excellent internal consistency in its original  
3 study ( $\alpha = .96$ ) and in the current study ( $\alpha = .97$ ).

4 *Perfectionistic Self-Presentation Scale-Body Image* (PSPS-BI; Ferreira et al., 2016). The  
5 PSPS-BI is a 19-item self-report questionnaire which measures the need to present a  
6 perfect body image to others (e.g., “It is very important for me to present myself (my  
7 physical appearance) perfectly in social situations”). This is a 7-point scale (1 = “Strongly  
8 disagree”; 7 = “Strongly Agree”), where higher scores indicate greater perfectionist self-  
9 presentation. The PSPS-BI revealed an excellent internal consistency in the original ( $\alpha =$   
10  $.93$ ) and in the current study ( $\alpha = .93$ ).

11 *Eating Disorder Examination* (EDE-Q; Fairburn, & Beglin, 1994; Machado et al., 2014).  
12 EDE-Q is a self-report measure that assesses the frequency and intensity of disordered  
13 eating attitudes and behaviours. The EDE-Q focuses on the last 28 days and comprises  
14 four sub-scales: restraint, eating concern, weight concern and shape concern. The items  
15 are rated on a 7-point Likert-scale, in terms of occurrence (items 1-15, on a scale ranging  
16 from 0 = “None” and 6 = “Every day”) and frequency (items 29-36, on a scale ranging  
17 from 0 = “None” and 6 = “Extremely”), with higher values indicating higher severity of  
18 eating psychopathology (e.g., “Have you been deliberately trying to limit the amount of  
19 food you eat to influence your shape or weight (whether or not you have succeeded)?;  
20 Has your shape influenced how you think about (judge) yourself as a person?”). The EDE-  
21 Q global score presented an excellent internal consistency both in the original and  
22 Portuguese version ( $\alpha = .94$  and  $\alpha = .95$  respectively), as well as in the current study ( $\alpha$   
23  $= .94$ ).

24

1 *Procedures*

2 This study is part of a wider research project of the emotional regulation processes in  
3 sport context, conducted at the Center for Research in Neuropsychology and Cognitive  
4 Behavioural Intervention. All the ethics requirements were followed and approved by the  
5 Ethics Commission of the Faculty of Psychology and Educational Sciences of the  
6 University of Coimbra.

7 The sample was recruited mainly by contacting a wide range of sports clubs. The first  
8 step was to contact, by e-mail or telephone, the managers of the clubs to inform them  
9 about the aims and procedures of the study and to ascertain the possibility of data  
10 collection with their athletes. Twenty-two different clubs of aesthetic sports (e.g., ballet,  
11 gymnastic and figure skating clubs) were contacted, and eight agreed to collaborate. Each  
12 club gave the interested participants and their parents/legal tutors detailed information  
13 regarding the study (aims, procedures, and its voluntary and confidential nature).  
14 Afterwards, a written informed consent was obtained from all athletes' parents/legal  
15 tutors and from all athletes enrolled in this study. The self-report measures were  
16 completed during an authorized break (approximately 15 minutes) approved by their  
17 coaches, in the presence of one of the researchers. According to the aims of the present  
18 study, the inclusion criteria were: (i) female athletes; (ii) ages between 12 to 18 years old;  
19 (iii) Portuguese nationality; (iv) practice of an individual aesthetic sport.

20 Self-report measures were completed by 146 female athletes. However, four participants  
21 were excluded because they did not report their height or weight.

22

23 *Data analyses*



1 All analyses were conducted through SPSS (v.22; IBM Corp. Armonk NY) and the  
2 software AMOS (v.22, SPSS Inc., Chicago, IL) (Arbuckle, 2008).

3 Descriptive statistics (means and standard deviations) assessed the sample's  
4 characteristics. Pearson product-moment correlations were conducted to examine  
5 associations among age, zBMI, body image-related cognitive fusion (CFQ-BI), body  
6 image-related perfectionistic self-presentation (PSPS-BI) and disordered eating (EDE-Q)  
7 (Cohen et al., 2003). A Path analysis was performed to estimate presumed theoretical  
8 relationships among the study variables. The path model examined whether body image-  
9 related cognitive fusion was associated with disordered eating and whether this  
10 relationship was mediated by body image-related perfectionistic self-presentation, while  
11 controlling for age and BMI (Figure 1).

12 The Maximum Likelihood estimation method was used to test path model coefficients'  
13 significances and fit statistics, with a 95% confidence interval. The adequacy of the model  
14 was assessed by the chi-square ( $\chi^2$ ; in which a *p* value above .05 indicates a good fit), the  
15 normed chi-square (CMIN/DF; which should stand below 3), the Tucker Lewis Index  
16 (TLI) and the Comparative Fit Index (CFI), in which values above 0.90 indicate a good  
17 fit, and the Root-Mean Square Error of Approximation (RMSEA; which should stand  
18 below 0.08), using a 95% confidence interval (Hu & Bentler, 1999). Moreover,  
19 significance of mediational paths was further analysed using the Bootstrap resampling  
20 method, with 5000 Bootstrap samples and 95% bias-corrected confidence intervals  
21 around the standardized estimates of direct, indirect and total. A significant mediation  
22 effect ( $p < .05$ ) was considered when zero was not included in the interval between the  
23 lower and upper bound of the confidence interval (Nevitt & Hancock, 2001).

24

## Results

### *Preliminary analyses*

The assumption of the normality of the distribution of the variables was established by the analysis of Skewness and Kurtosis (Kline, 2016). Preliminary analyses assumed that data followed the assumptions of homoscedasticity, normality, linearity, independence of errors and multicollinearity and singularity between the variables (Field, 2004).

### *Descriptive and correlational analyses*

The means, standard deviations and Pearson correlation coefficients between the study variables are presented in Table 1. Results showed that body image-related cognitive fusion was significant and positively associated with body image-related perfectionistic self-presentation and with disordered eating, with strong magnitudes. Furthermore, body image-related cognitive fusion presented a significant and positive, albeit weak, association with age and a non-significant association with zBMI. Moreover, body image-related perfectionistic self-presentation presented a significant positive and strong association with disordered eating, as well as a significant positive and weak association with zBMI scores and with age. Results also showed that disordered eating revealed significant and positive associations with zBMI and age, with weak magnitudes. Finally, zBMI presented a non-significant association with age (Table 1).

Table 1.

*Means (M), Standard Deviations (SD) and Intercorrelation scores between the study's measures (N = 142).*

	<i>M</i>	<i>DP</i>	1.	2.	3.	4.
1. CFQ-BI	21.89	15.00	-	-	-	-
2. PSPS-BI	64.89	24.62	.67***	-	-	-
3. EDE-Q	1.31	1.24	.80***	.66***	-	-
4. zBMI	.14	1.16	.10	.20*	.29***	-
5. Age	13.97	1.67	.21*	.17*	.62***	.09

1 *Note:* CFQ-BI = Cognitive Fusion Questionnaire Body Image; PSPS-BI = Perfectionistic Self-Presentation  
2 Scale-Body Image; EDE-Q = Eating Disorder Examination Questionnaires; zBMI = Body Mass Index z  
3 scores. \* $p < .05$ , \*\*\* $p < .001$

4

#### 5 *Path Analysis*

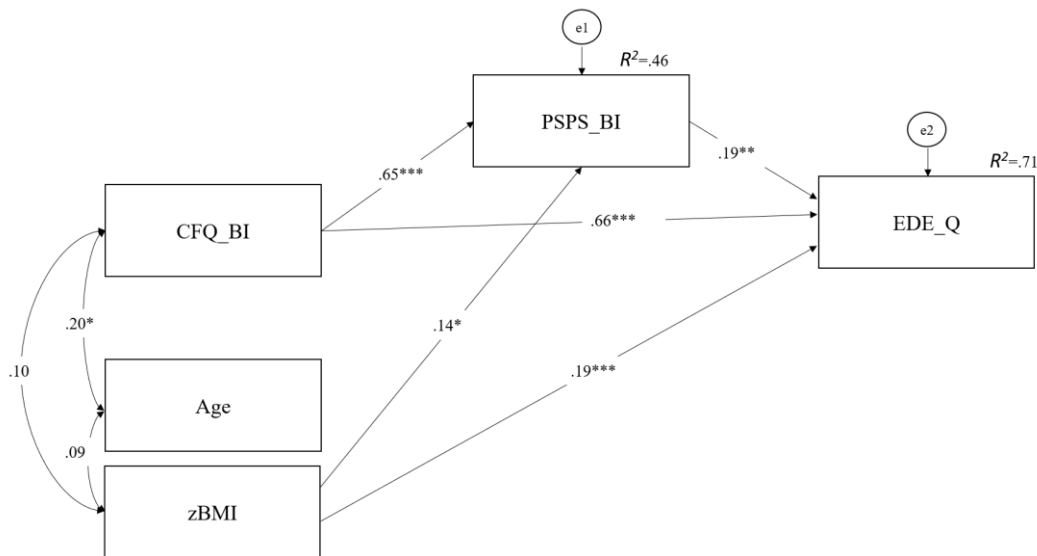
6 A path analysis was conducted to test whether body image-related perfectionistic self-  
7 presentation (PSPS-BI) mediated the link between body image-related cognitive fusion  
8 (CFQ-BI) and disordered eating severity (EDE-Q), while controlling for age and zBMI.  
9 The proposed model was first tested through a fully saturated model (with zero degrees  
10 of freedom) with 20 parameters.

11 Results indicated that two paths were not significant: the direct association between age  
12 and EDE-Q ( $b_{\text{age}} = .003$ ;  $SE_b = .04$ ;  $Z = .09$ ;  $p = .926$ ); and the direct association between  
13 age and PSPS-BI ( $b_{\text{age}} = -.31$ ;  $SE_b = .93$ ;  $Z = .34$ ;  $p = .73$ ). These paths were progressively  
14 eliminated, and the model was readjusted.

15 The final model (Figure 1) presented an excellent fit with a non-significant Chi-Square  
16 [ $\chi^2_{(2)} = .126$ ;  $p = .939$ ], and an excellent fit to the empirical data, as indicated by the  
17 analysis of well-known and recommended goodness of fit indices (CMIN/DF = 0.06; CFI  
18 = 1.00 ; TLI = 1.04 ; RMSEA = .00 ;  $p = .957$  , IC = .00 /.04; Kline, 2016).

1 This model, in which all path coefficients were statistically significant ( $p < .05$ ), explained  
 2 71% of the variance of disordered eating. Results indicated that CFQ-BI presented a  
 3 significant direct association of .65 on PSPS-BI ( $b_{CFQ-BI} = 1.07$ ;  $SE_b = .10$ ;  $Z = 10.49$ ;  $p$   
 4  $< .001$ ) and of .66 on EDE-Q ( $b_{CFQ-BI} = .05$ ;  $SE_b = .01$ ;  $Z = 10.70$ ;  $p < .001$ ). PSPS-BI  
 5 had a direct association of .19 on EDE-Q ( $b_{PSPS-BI} = .01$ ;  $SE_b = .00$ ;  $Z = 3.03$ ;  $p = .002$ ).  
 6 zBMI had a direct effect of .14 on PSPS-BI ( $b_{zBMI} = 2.89$ ;  $SE_b = 1.32$ ;  $Z = 2.20$ ;  $p = .028$ )  
 7 and of .19 on EDE-Q ( $b_{BMI} = .202$ ;  $SE_b = .05$ ;  $Z = 4.03$ ;  $p < .001$ ).

8 Taken together, results revealed that body image-related perfectionistic self-presentation  
 9 does mediate the association between body image-related cognitive fusion and disordered  
 10 eating.



11  
 12 *Figure 1.* Path model showing the association between body image-related cognitive fusion and disordered  
 13 eating, mediated by body image-related perfectionistic self-presentation, while controlling for zBMI and  
 14 age, with standardized estimates and square multiple correlations ( $R^2$ ;  $N = 142$ ). Note:  $***p < .001$ ;  $*p <$   
 15  $.05$ .

## 16 Discussion

1 Empirical studies have highlighted a higher prevalence of disordered eating in athletes  
2 than in non-athletes (Giel et al., 2016; Krentz & Warschburger, 2013), especially in  
3 athletes from aesthetic sports (Robins, et al., 2002; Sundgot-Borgen et al., 2013;  
4 Tiggemann et al., 2000). However, little is known about the body image-related emotional  
5 processes that may contribute to disordered eating in aesthetic athletic girls. The present  
6 study aimed to explore a comprehensive model to explain disordered eating in aesthetic  
7 athletic girls.

8 Results showed that body image-related cognitive fusion was strongly associated with  
9 disordered eating severity, which is in line with previous research (Ferreira et al., 2014;  
10 Melo et al., 2019; Trindade & Ferreira, 2014). Moreover, confirming the results of  
11 previous empirical studies (Ferreira et al., 2016; Ferreira et al., 2017; Ferreira et al., 2015;  
12 Marta-Simões & Ferreira, 2016), a strong relationship was found between body image-  
13 related perfectionist self-presentation and higher levels of disordered eating. Overall,  
14 these results corroborate previous studies that suggest that the entanglement with thoughts  
15 about body image and the need to exhibit a perfect body image to others, have a strong  
16 association with disordered eating attitudes and behaviours, and extend them by  
17 concluding that these relationships are also relevant in a sample of aesthetic athletic girls.  
18 Also, this study revealed that athletes who present higher levels of fusion with body  
19 image-related thoughts tend to show greater need to present a perfect body image to  
20 others.

21 To further understand the relationship among these body image-related emotional  
22 processes (i.e., cognitive fusion and perfectionistic self-presentation) and disordered  
23 eating, a theoretical model was explored in a sample of aesthetic athletic girls. In this  
24 model, it was hypothesized that the relationship between body image-related cognitive

1 fusion and disordered eating severity, was mediated by body image-related perfectionist  
2 self-presentation while controlling for zBMI and age.

3 Path analysis results demonstrated that the proposed model presents an excellent fit to the  
4 empirical data, accounting for 71% of the variance of disordered eating attitudes and  
5 behaviours, corroborating the initial hypothesis. Additionally, results revealed that 46%  
6 of body image-related perfectionist self- presentation was explained by body image-  
7 related cognitive fusion.

8 These findings reinforce the pervasive role of body image-related cognitive fusion on  
9 disordered eating (Ferreira et al., 2014; Melo et al., 2019; Trindade & Ferreira, 2014).

10 Moreover, this model demonstrates that the relationship between body image-related  
11 cognitive fusion and disordered eating is carried by the endorsement on compensatory  
12 perfectionist strategies. Results suggested that, in aesthetic athletic girls, the entanglement  
13 with thoughts about their body image may prompt the adoption of defensive and  
14 perfectionistic strategies, such as a greater need to present a perfect body image to others,  
15 which in turn may lead to disordered eating. Furthermore, data seems to suggest that  
16 aesthetic athletic girls tend to engage in disordered eating attitudes and behaviours, as a  
17 way to control weight and body shape and attain a perfect body image. Overall these  
18 findings suggest that, when aesthetic athletic girls get entangled with unpleasant thoughts  
19 about their body image, disordered eating attitudes and behaviours may emerge as a  
20 strategy to strive for a perfect body image, perceived as a need to enhance their  
21 performance and approval in sport context.

22 These results should be considered by taking into account some limitations. This is a  
23 cross-sectional study, and for that reason limits any causal inferences. Longitudinal  
24 studies are necessary to validate the nature and direction of the tested model. Moreover,  
25 this study only focused on female participants, for that reason future studies should

1 consider males in the study of these variables. Another limitation was the use of data  
2 exclusively based on self-report measures, which may lead to some biases. Finally, and  
3 considering that disordered eating is a multi-determined phenomenon, other emotional  
4 processes should be considered to explain this phenomenon. Future prospective studies  
5 should be conducted to clarify the associations between these variables and propose  
6 causal inferences. "Future prospective studies should be conducted to clarify the  
7 associations between these variables and propose causal inferences. Also, future research  
8 is needed to compare the acceptability and impact of Cognitive-Behavioural Therapy  
9 (CBT) and Acceptance and Commitment Therapy- based (ACT) interventions to promote  
10 athlete's adaptive ways to deal with their body image.

11 Nevertheless, this is the first study examining the mediating role of body image-related  
12 perfectionistic self-presentation in the association between body image-related cognitive  
13 fusion and disordered eating in aesthetic athletic girls. This study clarified the pervasive  
14 role of body image-related cognitive fusion in disordered eating, as well as, in body  
15 image-related perfectionistic self-presentation as a maladaptive strategy to deal with  
16 cognitive fusion.

17 Previous studies have reported that the practice of sports is an environment which can  
18 increase athlete's susceptibility for the development of maladaptive eating attitudes and  
19 behaviours, especially in female athletes from aesthetic sports (Currie, 2010; Kong &  
20 Harris, 2015). Regarding the central role that body image has on adolescence and even  
21 more in aesthetic athletic girls (Giel et al., 2016), the present study offers new empirical  
22 data that may be relevant for clinical and sport psychology practitioners. This study offers  
23 important insights by suggesting that body image-related cognitive fusion may be at the  
24 root of perfectionistic self-presentation behaviours and disordered eating. Furthermore,  
25 data highlights the relevance of education programmes that promote more adaptive

1 emotional strategies focusing on body image, to increase athlete's defusion skills and the  
2 acceptance of unpleasant thoughts and emotions related to their body image. Moreover,  
3 our data seems to indicate that intervention and prevention programs for aesthetic athletes,  
4 should focus on the development of more adaptative strategies related to body image,  
5 through the cultivation of a balanced and acceptance relationship with one's own body  
6 characteristics (e.g., Tylka & Wood-Barcalow, 2015) rather than on the adoption of body  
7 image-related perfectionist self-presentation strategies.

## 8 **Declarations**

9 **Funding** This research did not receive any specific grant from funding agencies in the  
10 public, commercial, or not-for-profit sectors.

11 **Availability of data and material** The datasets collected and analysed during the current  
12 study are not publicly available due to the present research is part of a wider research,  
13 thus the data is still being used by the authors.

## 14 **Compliance with ethical standards**

15 **Conflicts of interests** The authors declare that they have no conflict of interest.

16 **Ethics approval** All the ethics requirements were followed and approved by the Ethics  
17 Commission of the Faculty of Psychology and Educational Sciences of the University of  
18 Coimbra.

19 **Consent to participate** A written informed consent was obtained from all participants'  
20 parents/legal tutors and from all participants enrolled in this study.

21



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