

Parental Influences on Elite Aesthetic Athletes' Body Image Dissatisfaction and Disordered Eating

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Abstract Although different forms of parental influences on adolescents' body image and eating disturbances have been studied, this relationship is nearly uninvestigated within the population of aesthetic athletes, a risk group for the development of eating disorders. The present study examined the role of specific family variables on the body image dissatisfaction (BID) and disordered eating (DE) of elite aesthetic athletes ($n = 85$) and controls ($n = 142$). Adolescents ($M = 14.87$ years, $SD = 2.22$) completed measures of direct influences (concern with thinness and weight teasing by parents), perceived quality of relationship with each parent and the overall family environment, BID and DE. Participants' parents (223 mothers and 198 fathers) also completed measures of BID and DE. In general, parents of athletes do not present higher levels of BID or DE than do controls' parents. Interesting differences were found between athletes' and controls' BID and DE predictors. Among athletes, direct parental influences are the only significant predictive family variable, which can reinforce the pressure to be thin found within elite-aesthetic contexts. The study's findings highlight not only the importance of critical parental comments in athletes' expression of BID and DE, but also of maternal modeling among adolescents in the general population. Such parental behavior may be an appropriate target in different prevention efforts.

Keywords Aesthetic athletes · Parental influences · Body image dissatisfaction · Disordered eating · Predictors

Introduction

The impact of family influence on the development of body image and eating disturbances has been identified by several studies with patients diagnosed with eating disorders (e.g., Latzer et al. 2002; Minuchin et al. 1978) as well as with the general adolescent and young adult population (Vincent and McCabe 2000; Yanez et al. 2007). The only literature review to date about parental influence merely includes studies in the general population (Rodgers and Chabrol 2009) because, in clinical samples, parents' behaviors and attitudes regarding weight, eating and body image can be influenced by their child's diagnosis or therapeutic interventions. Most of these studies have been conducted exclusively with female adolescents and their mothers; however, data suggest that both mothers and fathers are important sources of influence for their child's body image and eating habits, regardless of that child's gender. Furthermore, this influence may take place via different mechanisms.

The first mechanism, which has received much attention, concerns the direct transmission of weight-related attitudes and opinions from parent to child. Both cross-sectional and longitudinal studies conducted with preadolescents and adolescents show that critical negative comments about eating and weight are predictors of body image dissatisfaction, weight concerns and disordered eating (Ata et al. 2007; Kluck 2010; Pike and Rodin 1991; Smolak et al. 1999; Wertheim et al. 2002). Conversely, studies have also demonstrated that lower levels of disordered eating are associated with the perception of more positive messages regarding eating and weight (Gross and

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Nelson 2000; Kichler and Crowther 2009). In fact, this influence can have several long-term effects, not only on body dissatisfaction and disordered eating but also on self-esteem and depressive symptoms. These effects have been shown by some retrospective studies in which undergraduate students reported their experiences about parental weight-related teasing in childhood and adolescence (Benas and Gibb 2008; Taylor et al. 2006). Vincent and McCabe (2000) revealed some specific features of the influence of each parent on his or her children's disordered eating. Specifically, discussion with both parents on topics related to weight or diet and parental encouragement of weight loss proved to be predictors of disordered eating among girls; however, for boys, only maternal encouragement predicted weight loss behaviors and binge eating. Given these differences, future research should include the participation of both mothers and fathers.

Another important mechanism of parental influence is modeling of dysfunctional eating attitudes and behaviors. Several studies with adolescent girls and their parents have shown significant associations between abnormal eating attitudes of mothers and daughters (Pike and Rodin 1991; Vincent and McCabe 2000); however, the same association does not exist with fathers when they are included (Keel et al. 1997; Yanez et al. 2007). As it is still unclear whether parental eating behaviors are associated with dysfunctional eating behaviors in adolescent boys (Keery et al. 2006; Vincent and McCabe 2000), the influence of parent gender on problem eating behaviors needs to be clarified among both boys and girls.

The final form of parental influence referred to in existing literature is the quality of family relationships, primarily overall family environment and relationships with parents. Family connectedness has been associated with higher body satisfaction in both boys and girls (Boutelle et al. 2009; Crespo et al. 2010). Additionally, several specific aspects of the relationships that adolescents have with each parent have proven to be rather important. May et al. (2006) identified different dimensions of maternal relationships, such as decreased intimacy and knowledge of children's daily experiences, as predictors of weight concerns in young girls. However, the authors suggested that parent–adolescent conflict is the most important relationship-quality factor linked to adolescent weight concerns. Additionally, other studies conducted only with girls have shown that perceptions of negative parental relationships are associated with less healthy dieting and body image, thus highlighting the role of relationships with both mothers and fathers in the development of healthy or disordered eating of adolescent girls (Archibald et al. 1999; Swarr and Richards 1996).

The world of aesthetic sports—“sports usually thought of as ‘appearance’ sports in which the sport participant's

appearance as well as her sport performance is being judged” (R. Thompson and Sherman 2010, p. 211), such as dance, figure skating or gymnastics—is considered a high risk context for the development of eating disorders among adolescents (e.g., Byrne and McLean 2002; Francisco et al. 2012; Sundgot-Borgen and Torstveit 2004). The adolescents who practice elite aesthetic sports are subject to additional pressures from coaches and are frequent targets of critical comments pressuring them to be thin and to control weight and body shape to achieve excellence in performance (Kerr et al. 2006; Muscat and Long 2008). In fact, many studies suggest that coaches have a major influence on the body image and eating behaviors of athletes (Byrne and McLean 2002; Toro et al. 2009). However, the influence of parents on the body dissatisfaction and disordered eating of their aesthetic-athlete children remains unknown. In 2001 (Klump, Ringham, Marcus, and Kaye), a study on female ballet dancers showed that dancers had significantly higher levels of family history of eating disorders than participants in a control group, reinforcing the need to conduct studies with athletes that include family variables, as pointed by some authors (Ringham et al. 2006; Thomas et al. 2005).

To our knowledge, only two other studies examine the families of athletes in non-aesthetic sports. Of these, only one evaluated the relationship between eating behaviors of mothers and athlete daughters, which was conducted with competitive (but not elite) tennis players and did not show an association between the eating behaviors of mothers and their athlete daughters (Harris and Foltz 1999). The other, more recent study found greater body image disturbance and higher levels of disturbed eating attitudes among female and male college athletes who reported family climates with low perceived support and autonomy (Blackmer et al. 2011).

In a previous study about individual and relational risk factors (e.g., self-esteem, social pressure for thinness), we found direct parental influences (e.g., weight teasing) on disordered eating among elite aesthetic athletes but not on that of non-elite aesthetic athletes or participants in the control group (Francisco et al. 2012). Furthermore, we posit that the quality of family relations, as well as the way athletes' parents deal with their own body image and eating, may influence athletes' perception of messages transmitted in these high-risk contexts, and the impact of these messages on body image dissatisfaction and eating behaviors.

The purpose of the present study was to explore the role of specific family variables in elite aesthetic athletes' body image dissatisfaction and disordered eating. We evaluate body image dissatisfaction and disordered eating patterns of each parent as well as the adolescent. We also assess adolescents' perceptions of other family variables: parent concern with their child's thinness and parental weight teasing, the perceived quality of maternal/paternal relationships, and the perceived quality of family environment. Because

previous research was mainly developed with adolescents from the general population, four different objectives were identified within this study: (1) to examine differences between elite aesthetic athletes and controls in body image dissatisfaction, disordered eating and family variables; (2) to examine the correlations between parental and adolescents variables in populations of elite aesthetic athletes and control participants; (3) to investigate different possible family-oriented predictors of body image dissatisfaction and disordered eating for elite aesthetic athletes and controls; and (4) to examine differences in family characteristics of both the elite aesthetic athletes and controls, with and without clinical indication of disordered eating.

Method

Participants

The study involves 227 adolescents of both sexes—85 athletes ($M = 15.35$ years, $SD = 2.73$; 70.6 % females) and 142 controls ($M = 14.58$ years, $SD = 1.81$; 57.7 % females)—and their parents (223 mothers, $M = 44.71$ years, $SD = 5.34$; 198 fathers, $M = 47.25$ years, $SD = 6.43$). The elite aesthetic athletes are gymnasts participating in international competitions ($n = 44$; 63.6 % females) and professional dance students ($n = 41$; 78 % females).

The majority of participants (79.3 %) come from intact nuclear families, 11.1 % from single-parent families and the remainder from other family configurations. The participants live in various regions in Portugal, including the center (48 %), the Lisbon metropolitan area (47.6 %), the north (3.5 %) and the south (0.9 %). The participants represent part of a sample from a previous study on predictive risk factors of disordered eating (Francisco et al. 2012), specifically participants whose parents returned parent self-report questionnaires (elite athletes' parents' response rate 65 %; controls' parents' response rate 30 %).

Measures

Measures Completed by Adolescents

McKnight Risk Factor Survey-IV (MRFS-IV; The McKnight Investigators 2003) The MRFS-IV is a self-report questionnaire that assesses potential risk factors for the development of eating disorders. The Portuguese version (Francisco et al. 2011) used in the present study consists of 82 items (most of them rated on a 5-point Likert scale, from “Never” to “Always”), organized into eight indicators and nine factors. The “Parental Influences” factor (the only one of MRFS-IV related to family influences), consisting of four items—“In the past year, how often has your father (mother)

made a comment to you about your weight or your eating that made you feel bad?” and “In the past year, how important has it been to your father (mother) that you be thin?”—is used to evaluate the influence of parent concern with thinness and weight teasing by parents ($\alpha = .72$).

Perception of Parent–Child Relationships Quality and of Family Environment Through three items rated on a 5-point Likert scale (from “Very bad” to “Very well/good”), adolescents are questioned about their perception of the quality of their relationship with each parent—“How is your relationship with your father (mother)?”—and the quality of their family environment—“How is your family environment?”.

Measures Completed by Both Adolescents and Parents

Contour Drawing Rating Scale (CDRS, Thompson and Gray 1995) Body image dissatisfaction (BID) was assessed by the Portuguese version of CDRS (Francisco et al., in press), consisting of a sequence of nine silhouettes ordered from the thinnest to the largest. The participants choose silhouettes that represent their current and ideal body size. The discrepancy between these two is an indicator of BID. The CDRS has good test–retest reliability ($r = .91$) and construct validity ($r = .65$ with weight; $r = .72$ with BMI) among both adolescents and adults.

Eating Disorder Examination-Questionnaire (EDE-Q, Fairburn and Beglin 1994) The level of disordered eating (DE), understood in a continuum, was evaluated using the Portuguese version of the 5th edition of EDE-Q (Machado and Martins 2010). This is a self-report questionnaire of 28 items grouped into four subscales (“Restraint”, $\alpha = .87$; “Shape Concern”, $\alpha = .91$; “Eating Concern”, $\alpha = .86$; and “Weight Concern”, $\alpha = .82$), the average of which constitutes a global score ($\alpha = .95$). The items are rated on a 7-point Likert scale (from “None”/“Nothing” to “Everyday”/“Extremely”). In the current study, the EDE-Q showed good psychometric properties with greater internal consistency values in the sample of adolescents than in the sample of parents [Global Score (adolescents $\alpha = .92$; parents $\alpha = .83$), Restraint (adolescents $\alpha = .81$; parents $\alpha = .75$), Shape Concern (adolescents $\alpha = .91$; parents $\alpha = .86$), Eating Concern (adolescents $\alpha = .77$; parents $\alpha = .68$) and Weight Concern (adolescents $\alpha = .84$; parents $\alpha = .75$)].

Procedure

All participants completed an informed consent process before answering the surveys. In order for adolescents to participate, authorization was sought from their parents/guardians. The main researcher delivered athlete surveys to

the dance teachers/gymnastics coaches, who in turn handed the surveys to their students/gymnasts. Most athletes completed the surveys at home. The surveys were later returned in sealed envelopes with no identifying information, thus preserving anonymity. All adolescents in the control group completed the surveys during normal classes at their schools in the presence of the main researcher. All parents received their surveys (with a code matching that of their child) via their children, who, in turn, returned them to the research group a week later in a sealed envelope. Permission to conduct the study was provided by the Ministries of Science (FCT) and of Education.

Statistical Analyses

Statistical analyses were conducted using SPSS 18.0. We used the Kruskal–Wallis test to compare athletes and controls on all study variables, given the small sample size of male athletes ($n < 30$). Chi-square test examined categorical frequencies, and the relationships between the variables were investigated using Spearman correlations.

Separate multiple regressions were used to investigate which parental and family variables predict adolescents' BID and DE for athletes and controls. For each of the dependent variables (BID and DE), we previously conducted three separate analyses for each set of variables (mother, father, and family) to better select the predictors to include in the final models and to assure at least 10 participants per predictor (Field 2009). In all three sets, adolescent individual variables—sex and BMI—were included in Step 1 given the strong relationships established between females and DE and between high BMI and DE in existing literature (e.g., Field et al. 2001). The first set included mothers' BID and EDE-Q subscales; the second included fathers' BID and EDE-Q subscales; and the last included parental influences, perception of paternal relationship, of maternal relationship, and of the family environment. Those predictors which were significant ($p < .05$) or near significant ($p < .10$) for each dependent variable of athletes or controls were then culled from these preliminary regressions and used in the final multivariate models.

Results

Descriptive Statistics and Differences Between Athletes and Controls

Table 1 presents the descriptive statistics of all variables and the results of mean comparisons between athletes and controls (separated by sex) and between respective parents.

Male athletes and controls showed no significant differences in any of the variables. Female athletes reported lower

BMI and higher levels of restraint and eating concern (two subscales of EDE-Q) than did controls. Regarding adolescents' parents, there were no significant differences in any variable between the mothers of athletes and controls, regardless of gender, or between the fathers of female athletes and the fathers of female controls. However, there were some differences between fathers of male athletes versus controls: the fathers of male athletes reported significantly higher BMI than did those of controls as well as higher levels of BID, shape concern and EDE-Q global score.

Correlations

Table 2 presents correlations between the variables answered by adolescents, separated by athletes and controls. In addition to the expected moderate-to-strong correlations between BID and DE, where the correlations were stronger for athletes than for controls, there were important family-variable correlations to note. While there was no significant correlation between parental influences and BMI of athlete participants, there was a significant relationship between these variables for the controls. However, parental influences were more strongly correlated to the BID and DE of athletes than to those of controls. With regard to athletes' perception of family relationships, the maternal relationship did not present significant correlations with the BID or DE of either athletes or controls; interestingly, the paternal relationship presented a weak but significant correlation with the DE of both groups of adolescents. Finally, the quality of family environment was associated with parental influences reported by athletes but not with those reported by the controls. However, the reverse was true for DE such that the perception of family environment significantly correlated with the DE of controls only but not with athletes' DE.

Parental influences reported by children (athletes or controls) did not correlated with any of the parental variables indicative of BID or DE (Table 3). All significant correlations of adolescents' BID and DE with parental variables were weak ($r < .30$). Among the athletes, fathers' eating concern alone was significantly correlated with children's DE. Among the controls, only maternal variables were correlated with the BID and DE of their children—shape concern, weight concern and EDE-Q global score—with correlation with DE being stronger than with BID.

Body Image Dissatisfaction and Disordered Eating Family Predictors

Tables 4 and 5 show the final regression models in both samples, for BID and DE, respectively. Regarding athletes' BID, sex, BMI and parental influences were significant predictors, accounting for 41 % of the variance; maternal

Table 1 Descriptive statistics and mean comparisons (N = 227)

	Range	Girls (n = 142)				Boys (n = 85)			
		Athletes (n = 60)	Controls (n = 82)	U	p	Athletes (n = 25)	Controls (n = 60)	U	p
<i>Adolescents</i>									
Age (years)		15.05 (2.40)	14.51 (1.81)	2193.50	–	16.08 (3.33)	14.68 (1.81)	596.00	–
BMI		18.66 (2.17)	19.79 (2.62)	1925.50	<.05	20.96 (3.21)	20.54 (3.42)	634.00	–
Parental influences	1 to 5	1.42 (0.59)	1.21 (0.41)	2068.50	–	1.16 (0.36)	1.18 (0.34)	641.50	–
Maternal relationship	1 to 5	4.63 (0.54)	4.66 (0.62)	2234.50	–	4.71 (0.47)	4.56 (0.74)	707.50	–
Paternal relationship	1 to 5	4.50 (0.65)	4.34 (0.88)	2232.00	–	4.64 (0.63)	4.37 (0.73)	628.50	–
Family environment	1 to 5	4.47 (0.60)	4.38 (0.72)	2356.50	–	4.50 (0.86)	4.24 (0.80)	712.50	–
Body image dissatisfaction	–8 to 8	–0.55 (1.25)	–0.61 (1.34)	2425.50	–	–0.21 (0.89)	–0.07 (1.17)	729.00	–
Restraint	0 to 7	1.33 (1.33)	0.78 (1.18)	1861.50	<.01	0.47 (0.67)	0.36 (0.83)	626.50	–
Shape concern	0 to 7	1.81 (1.65)	1.46 (1.36)	2365.50	–	0.67 (0.98)	0.77 (1.05)	729.50	–
Eating concern	0 to 7	0.97 (1.24)	0.46 (0.68)	2042.00	<.05	0.13 (0.23)	0.25 (0.48)	742.50	–
Weight concern	0 to 7	1.97 (1.80)	1.59 (1.56)	2264.50	–	0.45 (0.81)	0.59 (0.95)	743.50	–
EDE-Q global score	0 to 7	1.52 (1.41)	1.07 (1.09)	2135.50	–	0.43 (0.56)	0.49 (0.73)	721.50	–
<i>Mothers</i>									
BMI		23.27 (3.68)	23.94 (3.84)	1893.50	–	24.78 (7.14)	24.53 (4.45)	525.50	–
Body image dissatisfaction	–8 to 8	–1.50 (1.31)	–1.14 (1.34)	2015.00	–	–1.64 (2.02)	–1.49 (1.40)	557.50	–
Restraint	0 to 7	0.54 (0.92)	0.73 (0.97)	2154.50	–	0.96 (1.60)	1.05 (1.43)	624.50	–
Shape concern	0 to 7	1.16 (1.24)	1.22 (1.12)	2044.50	–	1.25 (1.87)	1.24 (1.39)	667.00	–
Eating concern	0 to 7	0.26 (0.61)	0.22 (0.50)	2291.00	–	0.46 (1.04)	0.13 (0.37)	623.50	–
Weight concern	0 to 7	1.22 (1.32)	1.15 (1.14)	2004.50	–	1.30 (1.79)	1.26 (1.33)	666.00	–
EDE-Q global score	0 to 7	0.79 (0.89)	0.83 (0.78)	1909.00	–	0.99 (1.49)	0.92 (1.01)	657.50	–
<i>Fathers</i>									
BMI		26.58 (3.83)	26.76 (3.38)	1705.50	–	28.28 (4.38)	26.80 (4.12)	339.50	<.05
Body image dissatisfaction	–8 to 8	–1.24 (0.94)	–0.83 (1.11)	1654.00	–	–1.50 (1.09)	–0.93 (0.91)	362.00	<.05
Restraint	0 to 7	0.67 (0.98)	0.61 (1.17)	1844.50	–	0.54 (1.02)	0.37 (0.75)	462.00	–
Shape concern	0 to 7	1.06 (1.25)	0.71 (1.13)	1676.00	–	0.96 (0.94)	0.58 (0.97)	377.50	<.05
Eating concern	0 to 7	0.24 (0.43)	0.23 (0.65)	1932.00	–	0.10 (0.28)	0.07 (0.21)	526.00	–
Weight concern	0 to 7	1.09 (1.40)	0.89 (1.41)	1841.00	–	0.93 (0.94)	0.67 (1.04)	381.00	–
EDE-Q global score	0 to 7	0.76 (0.86)	0.61 (0.94)	1733.00	–	0.63 (0.53)	0.42 (0.65)	305.00	<.01

variables were not significant predictors. For controls' BID, only sex and BMI were significant contributors, explaining merely 26 % of the variance. For athletes' DE, sex, BMI and parental influences were the only predictors, accounting for 42 % of the variance. In the controls' DE model, the variables significant in the athletes' model, as well as perceived family environment, mothers' eating concern and mothers' weight concern, in total explained 49 % of the variance in DE.

Family Characteristics of the Group with Clinical Indication of DE

Taking into account the clinical indication of DE (EDE-Q subscales or global score ≥ 3.5 ; Machado and Martins

2010), we compared the family variables' scores of those adolescents who score above the EDE-Q cut-off (n = 37; 17 athletes and 20 controls) with those of sub-cut-off adolescents. Because these adolescents included only six males, and given that the clinical indication of DE has not proven to be associated with belonging to the athletes or control group [$\chi^2(1) = 1.46, p = .265$], we aggregated all participants with EDE-Q scores above the clinical cut-off, regardless of sex or study condition, and compared their analyses with all other adolescents who scored below EDE-Q cut-off.

Adolescents with a clinical indication of DE reported significantly higher levels of parental influences (M = 1.64, SD = 0.67 vs. M = 1.19, SD = 0.38; U = 1796.00,

Table 2 Spearman correlations between adolescent variables, for athletes and controls

Athletes (n = 85)	Controls (n = 142)							
	1	2	3	4	5	6	7	8
Sex ^a	–	–.17*	.08	.03	–.07	.10	–.13	.37**
BMI	–.23*	–	.28**	–.03	–.12	–.24**	–.48**	.24**
Parental influences	.08	.00	–	.52**	–.14	–.13	–.22*	.37**
Maternal relationship	–.01	–.22	–.12	–	.51**	.52**	–.01	–.14
Paternal relationship	–.14	–.17	–.20	.68**	–	.63**	.07	–.25**
Family environment	.03	–.30**	–.24*	.62**	.55**	–	.10	–.25**
Body image dissatisfaction	–.18	–.50**	–.24*	.07	.19	.14	–	–.44**
Disordered eating	.35**	.26*	.45**	–.13	–.25*	–.21	–.69**	–

Athletes’ correlations appear below the diagonal, and controls’ correlations appear above the diagonal; ^a sex of adolescent (boys = 0, girls = 1); ** $p < .01$; * $p < .05$

Table 3 Spearman correlations between parental (BID and EDE-Q subscales) and athletes and controls’ variables (parental influences, BID and DE)

Variables	Athletes (n = 85)			Controls (n = 142)		
	Parental influences	BID	DE	Parental influences	BID	DE
Mother’s BID	.07	.10	–.06	–.07	.04	–.04
Mother’s restraint	.09	–.03	–.03	.13	–.04	.09
Mother’s shape concern	.06	.02	–.01	.08	–.19*	.27**
Mother’s eating concern	.01	.10	–.02	.12	–.02	.13
Mother’s weight concern	.14	–.04	.05	.05	–.20*	.26*
Mother’s EDE-Q global score	.05	.01	–.00	.10	–.17*	.29**
Father’s BID	–.03	.22	–.07	–.09	.03	–.02
Father’s restraint	–.07	–.21	.20	.14	–.10	.12
Father’s shape concern	–.01	–.20	.12	.09	.03	.11
Father’s eating concern	–.00	–.15	.25*	–.04	.03	.09
Father’s weight concern	–.05	–.20	.16	–.03	.02	.09
Father’s EDE-Q global score	–.06	–.23	.17	.02	–.02	.11

BID body image dissatisfaction, DE disordered eating; * $p < .05$; ** $p < .01$

Table 4 Summary of multiple linear regression analyses for variables predicting athletes’ and controls’ body image dissatisfaction

Variable	Athletes			Controls		
	B	SE B	β	B	SE B	β
Sex ^a	–0.86	0.27	–.33**	–0.57	0.21	–.22**
BMI	–0.28	0.05	–.61***	–0.18	0.04	–.41***
Parental influences	–0.44	0.20	–.22*	–0.24	0.24	–.08
Mother’ body image dissatisfaction	–0.03	0.10	–.03	–0.15	0.09	–.17
Mother’ restraint	–0.27	0.14	–.25	0.04	0.11	.04
Mother’ weight concern	0.18	0.12	.21	–0.21	0.12	–.20
R ²	.41			.26		
F	7.64***			7.01***		

^a Sex of adolescent (boys = 0, girls = 1); *** $p < .001$; ** $p < .01$; * $p < .05$

$p < .001$), perceived lower quality in their paternal relationship (M = 3.86, SD = 0.99 vs. M = 4.51, SD = 0.68; U = 2357.00, $p < .01$), lower quality in their maternal

relationship (M = 4.14, SD = 0.94 vs. M = 4.70, SD = 0.52; U = 2583.50, $p < .01$) and lower quality in family environment (M = 3.82, SD = 1.01 vs. M = 4.44,

Table 5 Summary of multiple linear regression analyses for variables predicting athletes' and controls' disordered eating

Variable	Athletes			Controls		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Sex ^a	1.07	0.28	.38***	0.82	0.14	.38***
BMI	0.17	0.05	.34**	0.06	0.02	.16*
Parental influences	1.01	0.22	.43***	0.97	0.16	.42***
Family environment	-0.13	0.20	-.07	-0.25	0.09	-.18**
Mother' eating concern	-0.05	0.26	-.02	-0.53	0.18	-.24**
Mother' weight concern	-0.05	0.12	-.05	0.26	0.07	.31***
<i>R</i> ²	.42			.49		
<i>F</i>	7.97***			20.57***		

^a Sex of adolescent (boys = 0, girls = 1); *** $p < .001$; ** $p < .01$; * $p < .05$

SD = 0.64; $U = 2664.00$, $p < .01$). Additionally, the parents of these adolescents revealed some differences on their own EDE-Q scores when compared with the parents of the adolescents below clinical levels of DE symptoms. Mothers were more concerned about their own body shape ($M = 1.65$, $SD = 1.19$ vs. $M = 1.17$, $SD = 1.29$; $U = 2368.50$, $p < .05$) and weight ($M = 1.53$, $SD = 1.23$ vs. $M = 1.15$, $SD = 1.28$; $U = 2606.00$, $p < .05$), while fathers had higher levels of restraint ($M = 0.99$, $SD = 1.27$ vs. $M = 0.48$, $SD = 0.95$; $U = 1883.00$, $p < .01$), weight concern ($M = 1.48$, $SD = 1.70$ vs. $M = 0.75$, $SD = 1.16$; $U = 1736.50$, $p < .05$) and EDE-Q global score ($M = 0.95$, $SD = 1.05$ vs. $M = 0.52$, $SD = 0.76$; $U = 1655.00$, $p < .05$).

Discussion

Our study sought to focus on the influences of several family variables—particularly related to the mothers and fathers of adolescents—in the body image dissatisfaction and disordered eating of elite aesthetic athletes, compared with a control group of non-athlete adolescents and their parents.

Related to the first objective of our study, adolescents' individual variables showed the expected differences according to the literature (e.g., Byrne and McLean 2002), with female athletes presenting lower BMI and higher levels of two indicators of disordered eating (restraint and eating concern) compared with the controls. However, we also expected to find global levels of disordered eating that were significantly higher, as demonstrated in a previous study in which these same adolescents participated (Francisco et al. 2012). Because the mean values of disordered eating are lower than expected in this study, we propose two possible explanations for this fact: (1) adolescents with higher levels of disordered eating may have been less ready to seek cooperation from parents to participate in the study

because the subject of the investigation could trigger weight- and/or eating-related conversations with their parents (a behavior that the literature shows people with disordered eating generally avoid); or (2) parents of adolescents with higher levels of disordered eating may have refused to participate, possibly because they also had unhealthy eating behaviors and attitudes. However, the absence of significant differences in body image dissatisfaction and disordered eating indicators of the mothers of participants of either gender and the fathers of female participants do not support the results of the only known study comparing aesthetic athletes with the controls (Klump et al. 2001). Given that different measures were used by Klump et al. (2001), future studies should be conducted to clarify whether there are significant differences between parents of elite aesthetic athletes and those of adolescents in general. For variables concerning family relationships, there were no significant differences between athletes and controls (either for boys or girls). Thus, we can assume that the quality of family environment and parental relationships, as well as parental influences on weight and body image, are perceived similarly by athlete and control adolescents.

Nevertheless, in the context of our second objective for this study, we found different associations between family variables and body image dissatisfaction and disordered eating for athletes than we did for the controls. The significant correlation between parental influences and BMI among controls, but not in the athletes, reinforces the idea that the critical comments received by elite athletes do not depend on their BMI, as well as social influence in general (Francisco et al. 2012). Instead, the critical comments received by elite aesthetic athletes are an element of the aesthetic sports subculture, and the parents also seem to follow this same subculture. The strength of the correlations between parental influences and body image dissatisfaction and disordered eating in athletes (more so than for controls) points to the importance of studying the family

contexts of aesthetic elite athletes, who are already a group at increased risk for the development of body image and eating disturbances. Moreover, given the absence of significant correlations between parental influences and parents' body image dissatisfaction or disordered eating, we suggest that perhaps parents are not motivated by their own personal concerns. Rather, we believe that parental influences may be a reflection of socio-cultural pressures: parents are simply a conduit for reinforcing thinness as the standard of beauty.

To address our third objective, we examined multiple regression models for both athletes and the controls. Different family factors predicted body image dissatisfaction and disordered eating for athletes and the controls. As expected, based on existing literature (e.g., Field et al. 2001; Francisco et al. 2012), adolescents' sex and BMI were significant predictors of either body image dissatisfaction or disordered eating for both athletes and the controls. In addition to these two individual predictors, parental influences emerged as the only family variable that predicted athletes' body image dissatisfaction and disordered eating, especially for disordered eating. We believe it is necessary to alert parents in the elite aesthetic sports community to the influence of their comments and values on their athlete children because these comments can strengthen the concerns of adolescents and others in the social contexts of the adolescent's sport (i.e., peers and coaches). Ideally, parents would be integrated into preventive actions within the context and communities of aesthetic elite sports. It is essential that the family system provides conditions that balance the demands of thinness within the community of these sports. In relation to control adolescents, parental influences were not predictive of body image dissatisfaction or any other family variable. However, for disordered eating in the control group, a larger number of family variables emerged as predictors. Apart from parental influences, consistent with Field et al. study (2001), eating and weight concern of mothers—confirming the influence of maternal modeling pointed by other authors (e.g., Pike and Rodin 1991)—and the negative perception of the quality of family environment proved to be important predictors, as opposed to the quality of the specific relationship with each parent. Thus, family environment should be taken into account in the future to explore the specific features that make this variable a predictor of disordered or healthy eating behaviors.

Finally, our fourth objective has led us to investigate the differences on family variables between adolescents who scored above and below the EDE-Q cut-off. Our results agree with the literature that investigates family characteristics associated with disordered eating: adolescents at higher clinical risk did perceive lower quality in their relationships with both parents, as well as within the family

environment overall (Archibald et al. 1999; Blackmer et al. 2011; Crespo et al. 2010), and their parents endorsed more weight teasing and concern with their child's thinness (Ata et al. 2007; Smolak et al. 1999). In addition, the differences between in parent–child relationships coincides with the findings of Pike and Rodin (1991), who found associations between mothers' and daughters' disordered eating behaviors, but not between those of father and daughter (Keel et al. 1997; Yanez et al. 2007). Our data, when considered in the context of existing literature, suggest the need to continue studying fathers and their eating behavior, a theme often neglected in other studies.

In conclusion, as was found by Wertheim et al. (2002), our data seem to indicate that parental influences have greater influence when it presents in the form of parent concern with child thinness and weight teasing rather than as parental modeling of dieting or body concerns, especially among athletes. Exposure to many other social models of eating behavior—from peers, television and, in the specific case of athletes, coaches—can diminish the contribution of parents. However, among adolescents in the general population, maternal modeling still seems to have a major impact on disordered eating. This finding should be taken into account in preventive actions, particularly because healthy food models can also predict healthy eating behaviors in adolescents.

The present study has several limitations that should be taken into consideration when interpreting our results. First, the relatively small sample size of adolescent athletes presents challenges, especially for carrying out multiple regressions. These regressions are potentially unstable and thus preliminary, offered as indicators for future research, which should also seek to test these models in different samples of male and female athletes. The cross-sectional design represents another limitation because it does not allow for causal inferences to be made with regard to the influence of family variables in the development of adolescents' body image dissatisfaction and disordered eating. Longitudinal studies are needed for a proper exploration of this influence. Despite these limitations, this study has strengths and makes important contributions to the literature. To our knowledge, it is the first time a characterization of the family influences on body image dissatisfaction and disordered eating has been conducted with both female and male aesthetic athletes, also including both mothers and fathers. Thus, being considered an exploratory study, this study has enabled the identification of several specific and relevant aspects of elite aesthetic athletes' families to be considered more rigorously in future studies.

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