

# Disordered eating behaviors and perfectionist traits in track and field athletes

CDD. 20.ed. 616.8526  
796.42

<http://dx.doi.org/10.1590/1807-55092016000300823>

Leonardo de Sousa FORTES\*  
Lenamar Fiorese VIEIRA\*\*  
Santiago Tavares PAES\*\*\*  
Sebastião de Sousa ALMEIDA\*\*\*\*  
Maria Elisa Caputo FERREIRA\*\*\*

\*Centro Acadêmico de Vitória, Universidade Federal de Pernambuco, Vitória de Santo Antão, PE, Brasil.

\*\*Centro de Ciências da Saúde, Universidade Estadual de Maringá, Maringá, PR, Brasil.

\*\*\*Faculdade de Educação Física e Desportos, Universidade Federal de Juiz de Fora, Juiz de Fora, MG, Brasil.

\*\*\*\*Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, SP, Brasil.

## Abstract

The aim of the study was to analyze the influence of perfectionism in disordered eating behaviors of track and field adolescent female athletes. Fifty-two track and field athletes of clubs in the city of São Paulo/SP aged between 12 and 17 years were participants. We used the subscales of the Eating Attitudes Test (EAT-26) and the Multidimensional Perfectionism Scale (MPS) to assess disordered eating behaviors and perfectionist traits, respectively. We conducted stepwise linear multiple regression to analyze the influence of perfectionism on disordered eating behaviors. The results indicated the influence of MPS on subscale Diet scores ( $F(1, 44) = 5.74$ ;  $p = 0.05$ ) and Oral Self-control ( $F(1, 44) = 6.13$ ;  $p = 0.04$ ) the EAT-26. However, there was not an impact of MPS on subscale Bulimia and Food Concern scores ( $F(1, 44) = 1.26$ ;  $p = 0.22$ ). Thus, it is assumed that the track and field athletes with perfectionist traits may be more susceptible to dietary restriction and environmental influence food intake.

KEY WORDS: Disordered eating; Body image; Adolescents; Athletes.

## Introduction

Food restrictions, binge eating disorder, laxative usage, diuretics and anabolic steroids are considered disordered eating behaviors<sup>1-2</sup>. It highlighted that this behaviors, body dissatisfaction and low body weight are diagnostic criteria for disordered eating<sup>3</sup>. Evidence indicates high risk behavior prevalence in disordered eating of adolescents<sup>4-5</sup>. However, female individuals are more affected by risk behaviors when compared to males<sup>6-7</sup>. According to FORTES et al.<sup>8</sup>, age-group, body morphology, sociocultural environment and personality traits can be associated with food restriction for long periods, binge, purgation (laxatives/diuretics usage) and environmental influence to food intake, are considered disordered eating behaviors.

One personality trait is perfectionism, which characterizes high exigency standards in conjunction with a tendency to be critic when evaluating its own behavior<sup>9</sup>. Perfectionist individuals tend to show high level of organization, persistency, control and

motivation to achieve their goals. Such characteristics, as perfectionism, are often found in sports community<sup>3</sup>.

Studies have shown that the larger the perfectionist trait in athletes, the higher the risk of disordered eating<sup>10-11</sup>. However, these investigations were developed with dancers. Considering dance modalities as aesthetic sport modalities, one cannot generalize the findings to athletes from other sports. It should be noticed that perfectionism is not necessarily related to adoption of disordered eating behaviors in athletes. For instance, ROUVEIX et al.<sup>5</sup> investigated judo athletes and did not find association between perfectionism and disordered eating behaviors. In the same vein, FILAIRE et al.<sup>12</sup> analyzed judo and cycling athletes and did not find association between perfectionism and risk of disordered eating behaviors.

Although scientific inquiries demonstrate a positive relation between perfectionism and disordered eating behaviors in general population, researchers underline that, when athletes are

considered, being perfectionist does not necessarily result in vulnerability in terms of adopting disordered eating behaviors<sup>12</sup>. This, in a sense, justifies the importance of conducting a study to analyze whether perfectionism has relation with disordered eating behaviors in athletes.

Another essential variable for triggering disordered eating behaviors that deserves emphasis is body dissatisfaction. Findings demonstrate that body dissatisfaction is the variable that better accounts for the variance of risk behavior in females<sup>13-14</sup>. Furthermore, evidence points to high prevalence of body dissatisfaction in teenager girls<sup>15-16</sup>. Researchers stress that body dissatisfaction in young women shows a strict relation to body morphology<sup>6,17</sup>. Accordingly, girls with high body adiposity tend to present higher dissatisfaction when compared with teenagers with lower body-fat percentage<sup>18</sup>. Thus, FORTES and FERREIRA<sup>6</sup> advise to control using statistical tools (covariates) the body dissatisfaction level and body-fat percentage to remove these effects on disordered eating behaviors.

There is evidence of increment of body fat in females through adolescence, which encompasses life from 10 to 19 years of age<sup>18</sup>. Maybe, for this reason,

teenagers use sport practice as a strategy to decrease body adiposity, depreciated aspect in occidental culture<sup>17</sup>. Above all, competitive sport is full of requirements to maximize athletic performance. Notwithstanding, there are findings that point that coaches, parents and sponsors are the main actors on the observed adoption of disordered eating behaviors by athletes<sup>2,6-7</sup>. Authors suggest that participating in competitive sport modalities might influence negatively eating behavior<sup>1,3</sup>. Nevertheless, ROUVEIX et al.<sup>5</sup> and FILAIRE et al.<sup>12</sup> argue that personality traits, for instance, perfectionism, can induce adoption of disordered eating behaviors as life habits by adolescents. In this light, the goal of the present study was to analyze the influence of perfectionism on disordered eating behaviors in female adolescent athletes.

Consequently, we formulated hypotheses based on previous discussions<sup>5,12</sup>: 1) perfectionism is positively associated with food restriction (Diet subscale of EAT-26); 2) perfectionism influences binge and purgation (Bulimia and Food Concern subscale of EAT-26) and; 3) perfectionism shows strict relation with encouraging environmental forces and food intake (Oral Self-control subscale of EAT-26).

## Method

### Participants

The sample was selected by convenience and not probabilistically. Fifty-two female adolescents (between 12 and 17 years of age), athletes of track and field (running, jumping and throwing modalities) in sport clubs from São Paulo, SP - Brazil. The inclusion criteria were to have signed the informed consent, to train five times per week with 2 hours per day, to participate in anthropometric assessments. Seven athletes were excluded provided that they did not fully answer the questionnaires. The sample was, then, constituted of 45 athletes [100 m sprint (n = 7), 200 m sprint (n = 5), 100 m hurdles (n = 5), 400 m hurdles (n = 4), pole vault (n = 6), long jump (n = 7), high jump (n = 5) and javelin throw (n = 6)], with a mean age of 15.26 ( $\pm$  1.78) years of age and 18.33 ( $\pm$  2.43) body-fat percentage.

### Instruments

To evaluate the disordered eating behaviors, we utilized the Eating Attitudes Test (EAT-26)

in its validated version for females by BIGHETTI et al.<sup>19</sup>, presenting internal consistency of 0.82. The questionnaire is composed of 26 questions distributed in three factors: 1) diet - refers to pathological refusal of high caloric food and physical appearance concern; 2) bulimia and food concern - refers to binge episodes followed by purgative behavior to reduce/control body weight; and 3) oral self-control - refers to self-control in terms of food and evaluates environmental forces and social stimuli to food ingestion. The final score of EAT-26 is given by the sum of its items and the threshold that indicates risk behavior of eating disorders (ED) is 21. We calculated the internal consistency for the present study and we obtained 0.80 for the Cronbach's alpha.

Perfectionism was assessed by Multidimensional Perfectionism Scale (MPS) validated for Portuguese language by SOARES et al.<sup>9</sup>. The scale is composed by 45 items that evaluate behavioral traits related to perfectionism. The MPS questions are disposed in Likert-like scales ranging from 1 (completely disagree) to 7 (completely agree). The score is the sum of each item. The bigger the score, the bigger

perfectionism. The Cronbach's alpha obtained (for internal consistency) was 0.75.

To evaluate the body dissatisfaction, we applied the Body Shape Questionnaire (BSQ) in its validated version for Brazilian adolescents<sup>20</sup>. The instrument presents good internal consistency (Cronbach's alpha = 0.96) and correlation coefficient between scores of test-retest is significant (0.89 for girls). In the sample of the present study, we found an  $\alpha$  value of 0.91 - which demonstrates good consistency. The self-evaluative questionnaire is composed by 34 questions in Likert-like scale related to concern that the adolescent presents in terms of body weight and physical appearance.

To calculate the body-fat percentage, we used the protocol developed by SLAUGHTER et al.<sup>22</sup> for adolescents. The triceps and subscapular skinfold thickness were measured, according to the standardization determined by International Society for Advancement for Kineanthropometry<sup>23</sup>, using an adipometer (LANGE® - Cambridge Scientific Industries Inc.) with precision of 1 mm. Each measurement was taken rotationally three times, being considered the mean of the values.

## Procedures

This research was submitted and approved by the Ethics Committee of the Faculdade de Filosofia, Ciências e Letras of University of São Paulo (USP-Ribeirão Preto) (protocol n. 119/2019 - CAE - 05166712.8.0000.5407). The guardians, as well the athletes, signed an informed consent that explained the goals and procedures of the study. Anonymity was guaranteed and the procedures and data analyses were confidential.

At first, the researchers contacted track and field coaches from São Paulo/SP. The procedures and goals of study were explained

and authorization was requested to allow participation of the team in the research.

After coaches' consent, a meeting with each team of athletes was organized to clarify the ethical procedures of the study. In this meeting, the informed consent form was provided for parents or guardians of the athletes to authorize participation (through signature of the consent form).

Data collection was performed in two distinct moments in adequate rooms offered by the sport clubs. In the first moment, athletes answered the questionnaires (EAT-26, MPS and BSQ), and in the second anthropometric measures were taken (skinfold thickness). In this way, athletes received the same instructions and had their questions answered. Also, the questionnaires provided written instructions on how to fill them. The questionnaire application occurred at the same time for all but each one answered its own questionnaire, which took approximately 30 minutes.

## Statistical analysis

The Shapiro-Wilk test showed no significant deviation of the distribution from a normal curve. In this way, we used central tendencies measures (mean), and dispersion (minimum, maximum, and standard deviation) to describe the research variables. Three multiple linear regressions were adjusted to data using the stepwise method: 1) to assess the influence of MPS, BSQ and body-fat percentage in the score of Diet subscale of EAT-26; 2) to assess the influence of MPS, BSQ and body-fat percentage in the score of Bulimia and Food Concern subscale of EAT-26; and 3) to assess the influence of MPS, BSQ and body-fat percentage in the score of Oral Self-Control subscale of EAT-26. All analyses were performed in SPSS 17.0 software adopting a significance level of 5%.

## Results

The findings from EAT-26 show that 13% (n = 6) of the athletes demonstrated disordered eating behaviors. Additionally, the results point that 27% (n = 12) of adolescents presented some level of body dissatisfaction evaluated by BSQ, segmented in

the following way: 21% (n = 9) lightly dissatisfied, 6% (n = 3) moderately dissatisfied, and 0% (n = 0) highly dissatisfied with their body. Beyond that, almost 40% (n = 19) showed high level of perfectionist traits (MPS > 168).

TABLE 1 - Descriptive values (minimum, maximum, median, mean and standard deviation).

Variable	Minimum	Maximum	Mean	SD
EAT-26	0	29	10.60	8.29
MPS	111	199	162.93	22.87
BSQ	40	119	68.83	19.36
Age (years)	12	17	15.26	1.78
%F	14	23	18.33	2.43

SD: Standard Deviation;  
EAT-26: Eating Attitudes Test;  
MPS: Multidimensional Perfectionism Scale;  
BSQ: Body Shape Questionnaire;  
%F: Body-fat Percentage.

The regression model presented in TABLE 2 showed influence of MPS ( $F(1.44) = 5.74$ ;  $p = 0.05$ ), BSQ ( $F(1.44) = 22.11$ ;  $p = 0.001$ ) and body-fat percentage ( $F(1.44) = 7.57$ ;  $p = 0.03$ ) on Diet subscale scores of EAT-26. These results indicate that perfectionism (17%), body dissatisfaction (46%) and body-fat percentage (3%) accounted for 66% of variance of the feeding restrictions to highly caloric food by female athletes ( $F(3.42) = 25.71$ ;  $p = 0.001$ ).

TABLE 2 - Multiple regression with MPS, BSQ, and body-fat percentage as independent variables and diet subscale of EAT-26 in adolescent female athletes as dependent variable.

R<sup>2</sup>: Adjusted R<sup>2</sup>;  
MPS: Multidimensional Perfectionism Scale;  
BSQ: Body Shape Questionnaire;  
%F=Body-fat percentage.

Variável	Bloco	B	R	R <sup>2</sup>	p valor
MPS	1	0.10	0.42	0.17	≤ 0.05
BSQ	2	0.16	0.79	0.63	≤ 0.01
%G	3	0.19	0.81	0.66	≤ 0.01

TABLE 3 shows the regression model on bulimia and food concern as dependent variable. The results point statistical influence only of BSQ ( $F(1.44) = 11.61$ ;  $p = 0.001$ ) and body-fat percentage ( $F(2.43) = 5.52$ ;  $p = 0.04$ ), accounting for 50% of the variance. Then, the findings show that body dissatisfaction (47%) and body-fat percentage (3%) influenced binge and purgative behaviors on track and field female athletes. We underscore that MPS ( $F(1.44) = 1.26$ ;  $p = 0.22$ ) did not explain the variance from bulimia and food concern subscale.

TABLE 3 - Multiple regression with MPS, BSQ, and body-fat percentage as independent variables and Bulimia and Food Concern subscale of EAT-26 in adolescent female athletes as dependent variable.

R<sup>2</sup>: Adjusted R<sup>2</sup>;  
MPS: Multidimensional Perfectionism Scale;  
BSQ: Body Shape Questionnaire;  
%F: Body-fat percentage.

Variable	Block	B	R	R <sup>2</sup>	p value
MPS	1	0.03	0.30	0.09	≤ 0.22
BSQ	2	0.10	0.69	0.47	≤ 0.01
%F	3	0.49	0.71	0.50	≤ 0.01

The last regression model results - which had as dependent variable the Oral Self-control subscale - are presented in TABLE 4. Only MPS ( $F(1.44) = 6.13$ ;  $p = 0.04$ ) showed significant impact (19%) on the Oral Self-control subscale. In this sense, BSQ ( $F(2.43) = 2.05$ ;  $p = 0.16$ ) and body-fat percentage ( $F(3.42) = 1.35$ ;  $p = 0.47$ ) did not account for variance of self-control in terms of food in adolescent track and field athletes.

TABLE 4 - Multiple regression with MPS, BSQ, and body-fat percentage as independent variables and Oral Self-Control subscale of EAT-26 in adolescent female athletes as dependent variable.

Variable	Block	B	R	R <sup>2</sup>	p value
MPS	1	0.11	0.44	0.19	≤ 0.04
BSQ	2	0.07	0.38	0.14	≤ 0.16
%F	3	0.30	0.23	0.05	≤ 0.47
All		13.34	0.52	0.27	≤ 0.03

R<sup>2</sup>: Adjusted R<sup>2</sup>;  
MPS: Multidimensional  
Perfectionism Scale;  
BSQ: Body Shape  
Questionnaire;  
%F: Body-fat percentage.

## Discussion

The present study had as the main goal analyze the influence of perfectionism on disordered eating behaviors in adolescent female athletes. Some authors have recommended to investigate whether personality traits can predispose athletes to disordered eating behaviors. However, studies conducted so far did not provide consistent data on the issue<sup>5, 10-12</sup>. It is worth noticing that the aforementioned investigations were conducted with athletes from other sport modalities. Thus, we highlight that this is the first study on the issue with track and field athletes. Beyond that, this is a pioneering investigation in Brazilian athletes.

The results of the present research showed prevalence of 13% of disordered eating behaviors (EAT+). These findings are corroborated by other studies conducted in female Brazilian athletes<sup>14, 18</sup>. It seems that the prevalence of risk behavior in female athletes of sports that are not predominantly aesthetics (track and field, basketball and soccer) tend to be relatively lower when compared to the prevalence in aesthetic sports (synchronized swimming, diving, artistic gymnastics)<sup>24</sup>. ROUVEIX et al.<sup>5</sup> argued that the imposed pressure on weight loss by coaches on athletes, aiming performance improvement, is the main triggering factor of abnormal eating behavior. Indeed, the scientific literature does not point track and field athletes as group in risk of disordered eating behaviors<sup>6, 17</sup>.

In terms of the first regression model (Diet subscale), the results show that 66% of the variance of food restriction can be accounted by perfectionism, body dissatisfaction and body-fat percentage (TABLE 2). These findings point that perfectionist traits can have an impact on long periods without ingestion of highly caloric food by female athletes, although the variance accounted for was small (17%). Maybe, female athletes restrict

food intake with the aim of reducing body weight and maximize performance. Although perfectionism was a weak predictor for food restriction, athletes with perfectionist traits might associate decreased frequency of poor performances with body-weight decrease. Thus, an athlete with perfectionist traits who believes that body weight reduction results in performance improvement, is more susceptible to show disordered eating. This status might be worsened if expected performance is not achieved.

In terms of the regression model considering Bulimia as the dependent variable, the results indicate an influence of body dissatisfaction and body-fat percentage only (TABLE 3). Against what some authors had previously found<sup>10-11</sup>, perfectionist traits did not relate to binge and purgative behavior in female athletes. These results can be explained by the fact that some items from Bulimia and Food Concern subscale of EAT-26 consider binge, an uncommon behavior within perfectionist individuals<sup>25</sup>.

In terms of the last regression model (TABLE 4), the results indicated that only perfectionist traits had influence on Oral Self-Control subscale scores. Notice that perfectionism was a weak predictor, accounting for 19% of variance only. Nevertheless, somehow, these findings show that perfectionism can influence the types and quantity of food that athletes ingest. According to PENNIMENT and EGAN<sup>25</sup>, youngsters who present perfectionist traits can learn with coaches and relatives the concepts of more and less healthy food with more ease than adolescents with lower perfectionist traits.

Although this investigation shows novel results, it is necessary to mention some limitations. We point the lower sample size which limits generalizability of results. However, considering studies on the issue, the literature presents similar sample sizes<sup>5, 12</sup>. We

also underscore the usage of indirect method to estimate body-fat from athletes. Nevertheless, we stress the difficulty to access and cost when such apparatuses are used.

The results of the present study allow us to conclude that perfectionism influenced only food restriction and oral self-control on types and quantity of ingested food in female athletes. In this sense, there is evidence that athletes with perfectionist traits are more susceptible for food restriction and environmental influence for food intake. In sum, young athletes, in having personality

traits related to perfectionism are more vulnerable for triggering ED.

Specifically, coaches must be attentive to perfectionist behavior of their athletes. Beyond that, it is recommended to track perfectionism by using MPS. In the case of an athlete with high perfectionist trait, it is recommended that the coach observe food restriction frequency, and type and quantity of ingested food by this athlete. If an abnormal feeding behavior is identified, the coach must refer the patient to professionals in the area of psychology, psychiatry and/or nutrition.

## Resumo

Comportamentos de risco para os transtornos alimentares e traços perfeccionistas em atletas de atletismo

O objetivo do estudo foi analisar a influência do perfeccionismo nos comportamentos de risco para os transtornos alimentares de atletas adolescentes do sexo feminino da modalidade atletismo. Fizeram parte do estudo 52 atletas da modalidade de atletismo de clubes da cidade de São Paulo/SP com idade entre 12 e 17 anos. Utilizaram-se as subescalas do Eating Attitudes Test (EAT-26) e a Multidimensional Perfectionism Scale (MPS) para avaliar os comportamentos de risco para os transtornos alimentares e os traços perfeccionistas, respectivamente. Conduziu-se a regressão linear múltipla stepwise para analisar a influência dos perfeccionismo nos comportamentos de risco para os transtornos alimentares. Os resultados indicaram influência da MPS nos escores das subescalas Dieta ( $F(1, 44) = 5,74; p = 0,05$ ) e Autocontrole Oral ( $F(1, 44) = 6,13; p = 0,04$ ) do EAT-26. No entanto, não foi evidenciado impacto da MPS nos escores da subescala Bulimia e Preocupação com o Alimento ( $F(1, 44) = 1,26; p = 0,22$ ). Assim, em razão da investigação apresentar delineamento transversal, pressupõe-se que as atletas de atletismo com traços perfeccionistas podem estar mais susceptíveis para a restrição alimentar e a influência ambiental para a ingesta alimentar.

PALAVRAS-CHAVE: Transtornos alimentares; Atletas; Perfeccionismo; Atletismo.

## References

1. Haase AM. Weight perception in female athletes: associations with disordered eating correlates and behavior. *Eat Behav.* 2011;12:64-7.
2. Scoffier S, Woodman T, D'Arripe-Longueville F. Psychosocial consequences of disordered eating attitudes in elite female figure skaters. *Eur Eat Disord Rev.* 2011;19:280-7.
3. Schaal K, Tafflet M, Nassif H, Thibault V, Pichard C, Toussaint J. Psychological balance in high level athletes: gender-based differences and sport-specific patterns. *PLoS One.* 2011;6:1-9.
4. De Bruin AP, Woertman L, Bakker FC, Oudejans RRD. Weight-related sport motives and girl's body image, weight control behaviors, and self-esteem. *Sex Roles.* 2009;60:628-42.
5. Rouveix M, Bouget M, Pannafieux C, Champely S, Filaire E. Eating attitudes, body esteem, perfectionism and anxiety of judo athletes and nonathletes. *Int J Sports Med.* 2007;28:340-5.
6. Fortes LS, Ferreira MEC. Comparison of body dissatisfaction and inappropriate eating behavior in adolescent athletes of different sports. *Rev Bras Educ Fís Esporte.* 2011;25:707-16.
7. Silva C, Gomes AR, Martins L. Psychological factors related to eating disordered behaviors: a study with Portuguese athletes. *Span J Psychol.* 2011;14:323-35.

8. Fortes LS, Almeida SS, Ferreira MEC. Maturation process, body dissatisfaction and inappropriate eating behavior in young athletes. *Rev Nutr.* 2012;25:575-86.
9. Soares MJ, Gomes AA, Macedo AF, Azevedo MHP. Escala multidimensional de perfeccionismo: adaptação portuguesa. *Rev Port Psicossomática.* 2003;5:46-55.
10. Goodwin H, Arcelus J, Geach N, Meyer C. Perfectionism and eating psychopathology among dancers: the role of high standards and self-criticism. *Eur Eat Disord Rev.* 2014;22:346-51.
11. Penniment KJ, Egan SJ. Perfectionism and learning experiences in dance class as risk factors for eating disorders in dancers. *Eur Eat Disord Rev.* 2012;20:13-22.
12. Filaire E, Rouveix M, Pannafeux C, Ferrand C. Eating attitudes, perfectionism and body-esteem of elite male judoists and cyclists. *J Sports Sci Med.* 2007;6:50-7.
13. Durme KV, Goossens L, Braet C. Adolescent aesthetic athletes: a group at risk for eating pathology? *Eat Behav.* 2012;13:119-22.
14. Fortes LS, Oliveira FG, Ferreira MEC. Influence of affective, anthropometric and sociodemographic factors on eating behavior in young athletes. *J Bras Psiquiatr.* 2012;61:148-53.
15. Mousa T, Mashal RH, Al-Domi HA, Jibril MA. Body image dissatisfaction among adolescent schoolgirls in Jordan. *Body Image.* 2010;7:46-50.
16. Rosendahl J, Bormann B, Aschenbrenner K, Aschenbrenner F, Strauss B. Dieting and disordered eating in German high school athletes and non-athletes. *Scand J Med Sci Sports.* 2009;19:731-9.
17. De Bruin AP, Oudejans RRD, Bakker FC. Dieting and body image in aesthetic sports: a comparison of dutch female gymnasts and non-aesthetic sport participants. *Psychol Sport Exerc.* 2007;8:507-20.
18. Fortes LS, Almeida SS, Ferreira MEC. Anthropometric indicators of body dissatisfaction and inappropriate eating behaviors in young athletes. *Rev Bras Med Esporte.* 2013;19:35-9.
19. Bighetti F, Santos CB, Santos JE, Ribeiro RPP. Tradução e avaliação do eating attitudes test em adolescentes do sexo feminino de Ribeirão Preto, São Paulo. *J Bras Psiquiatr.* 2004;53:339-46.
20. Conti MA, Cordás TA, Latorre MRDO. Estudo de validade e confiabilidade da versão brasileira do body shape questionnaire (bsq) para adolescentes. *Rev Bras Saúde Mater Infant.* 2009;9:331-8.
21. Vieira JLL, Amorim HZ, Vieira LF, Amorim AC, Rocha PGM. Distúrbios de atitudes alimentares e distorção da imagem corporal no contexto competitivo da ginástica rítmica. *Rev Bras Med Esporte.* 2009;15:410-4.
22. Slaughter MH, Lohman TG, Boileau R, et al. Skinfold equations for estimation of body fatness in children and youth. *Hum Biol.* 1988;60:709-23.
23. International Society for Advancement for Kineanthropometry. International standards for anthropometric assessment. Underdale: ISAK; 2001.
24. Fortes LS, Matta MO, Paes ST, Ferreira MEC. Fatores de risco associados ao comportamento alimentar inadequado em futebolistas. *Rev Bras Educ Fis Esporte.* 2012;26:447-54.
25. Penniment KJ, Egan SJ. Perfectionism and learning experiences in dance class as risk factors for eating disorders in dancers. *Eur Eat Disord Rev.* 2012;20:13-22.

## Acknowledgements

We thank coaches for allowing us to evaluate their athletes and the athletes for their collaboration when participating in the study.

Support: Conselho Nacional de Desenvolvimento Científico e Tecnológico.

ADDRESS

Leonardo de Sousa Fortes  
R. Clóvis Beviláqua, 163/1003  
50710-330 - Recife - PE - BRASIL  
e-mail: leodesousafortes@hotmail.com

Submitted: 07/24/2013

Revised: 05/12/2015

Accepted: 06/19/2015