SOCIAL PHYSIQUE ANXIETY, DISTURBED EATING ATTITUDES AND BEHAVIORS, AND PERCEIVED PRESSURE FOR THIN BODY IN COMPETITIVE RHYTHMIC AND AEROBIC GYMNASTS

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Abstract

This study investigated social physique anxiety (SPA), disturbed eating attitudes and behaviors (DEAB), and perceived pressure for thin body by the "significant others" (coach, parents, peers, experts) in 41 female rhythmic gymnastics (RG) and 49 aerobic gymnastics (AG) athletes at competitive level. Moreover, the potential impact of gymnasts' BMI was examined and controlled. Results showed that BMI associated with gymnasts' SPA, DEAB and perceived pressure, so its effect was controlled. There were no significant differences between RG and AG regarding SPA and DEAB, whereas AG athletes had higher parental pressure for thin body than RG athletes. When RG and AG data were merged, a high percentage (40%) of gymnasts presenting DEAB was revealed. Gymnasts with DEAB had significantly higher SPA and perceived pressure for thin body than those with normal eating attitudes and behaviors. These results underline the need for interventions involving "significant others" and aiming at DEAB prevention in female gymnasts.

Keywords: *eating disorders, female athletes, "significant others", health.*

INTRODUCTION

Athletes often present high levels of Social Physique Anxiety (SPA) (Martin Ginis, Lindwall, & Prapavessis, 2007; Prapavessis, Grove & Eklund, 2004) and disturbed eating attitudes and behaviors (DEAB) (Lanfranchi, Maïano, Morin, & Therme, 2014; Petrie & Greenleaf, 2007; Thein-Nissenbaum & Carr, 2011), with females being more vulnerable (Fairburn, & Beglin, 1990). SPA is defined as "a subtype of social anxiety that occurs as a result of the prospect or presence of interpersonal evaluation involving one's physique" (Hart, Leary, & Rejeski, 1989, p. 96). DEAB refer either to abnormal beliefs, feelings and thoughts regarding food (Alvarenga, Pereira, Scagliusi, Philippi, Estima & Croll, 2010) or abnormal dieting behaviors (Nattiv et al., 2007) and can have a negative effect not only on athletes' performance (Costarelli & Stamou, 2009) but also on their health, since they can lead to eating disorders (Chamay-Weber, Narring, & Michaud, 2005; Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004).

Differences in SPA and DEAB among different types of sports are often reported,

with female athletes participating in individual sports presenting higher SPA levels, dieting and bulimic behaviors than those participating in team sports (Haase, 2009). Particularly those who participate in aesthetic sports, such as synchronized swimming, gymnastics, and diving, tend to present higher levels of SPA and DEAB (Gay, Monsma & Mc Gehee, 2011; Haase & Prapavessis, 2001; Sundgot-Borgen & Torstveit, 2004). Especially in competitive gymnastics, where low body fat and low body weight are considered important factors for better appearance and performance (Sundgot-Borgen, 1993), female athletes present high percentage of DEAB (26% in rhythmic gymnasts [Kosmidou et al., 2015, Kosmidou, Giannitsopoulou, & Proios, 2018]; 30% in rhythmic and artistic gymnasts [Theodorakou & Donti, 2013]).

Among the factors associated with SPA is the perceived pressure to have a thin body by the "significant others" (Francisco, Narciso, & Alarcao, 2012). In recent years, more than ever, a greater pressure on athletes to be thinner has been noticed (Hausenblas & Fallon, 2006; Hausenblas & Downs, 2001). In gymnastics, the pressure to be thin is widely recognized as a fact (Salbach, Klinowski, Pfeiffer, Lehmkuhl, & Korte, 2007; Theodorakou & Donti, 2013). Female gymnasts train intensively and receive pressure to have thin bodies from a very young age (Kosmidou et al., 2018; Salbach et al., 2007). Adolescence is a period of hard training (Balyi, 2001); nevertheless, it is also a period in which females' body dissatisfaction begins to increase (Bearman, Presnell, Martinez, & Stice, 2006). The aforementioned, in conjunction with perceived pressure by "significant others", increase gymnasts' SPA (Stice & Shaw, 2002). Coaches, family and friends play an important role in young gymnasts' life, so they may contribute to both a negative body image and DEAB.

In light of the negative consequences that DEAB can have in athletes' performance and health, as well as the high percentage of DEAB prevalence in female gymnasts, the investigation of the association among SPA, DEAB and perceived pressure for thin body in female gymnasts seems important. However, current literature on this issue is restricted, as there is no study having investigated those three factors simultaneously. Moreover, to our knowledge, there is no study focusing on aerobic gymnastics, a gymnastics discipline with thousands of young female athletes. Based on the above, this study aimed at investigating SPA, DEAB and perceived pressure for a thin body by the "significant others" in female rhythmic and aerobic gymnasts at competitive level. In order to achieve a clear picture of the association among the aforementioned factors, the potential impact of athletes' BMI was examined and controlled, taken into account that significant relationships between BMI and DEAB (Atalay & Gencoz, 2008; Neumark-Sztainer, Wall, Story, & Standish, 2012; Snoek, van Strien, Janssens, & Engels, 2008; Theodorakou & Donti, 2013), SPA (Neumark-Sztainer et al., 2012; Snoek et al., 2008), and perceived pressure to be thin (Stice & Shaw, 2002) have been reported.

METHODS

A total of 90 Greek female gymnasts with a mean age of 13.9 years (SD= 2.42 years) participated in this study. Among them, 41 were Rhythmic Gymnastics (RG) athletes and 49 were Aerobic Gymnastics (AG) athletes. All of them were taking part in competitions at national and international level. Athletes' characteristics are presented in Table 1.

Social Physique Anxiety

For the measurement of gymnasts' SPA, the Greek adaptation (Psychountaki et al., 2004) of the Social Physique Anxiety Scale (SPAS, Hart et al., 1989)

was used. The SPAS aims at measuring the concerns of the individual about his/her physical appearance and the stress for a negative evaluation from others. The SPAS items are answered in a 5-point Likert scale (not at all [1], slightly [2], moderately [3], very [4], and extremely [5]), with higher values revealing higher SPA. Its original version (Hart et al., 1989) consists of twelve items; however, in the present study, a nine-item version was used (Martin et al., 1997), since it is thought to be conceptually clearer (Haase, 2009; Martin et al., 1997). Regarding the psychometrics of this SPAS version, high internal consistency and construct validity are reported (Martin et al., 1997). In the current study, Cronbach's alpha value was found at .77.

Disturbed eating attitudes and behaviors

Participants' DEAB were assessed with the Eating Attitudes Test (EAT-26; Garner & Garfinkel, 1979; Garner, Olmsteid, Bohr, & Garfinkel, 1982), adapted for the Greek population (Douka, Grammatopoulou, Skordilis, & Koutsouki, 2009; Varsou & Trikas, 1991). The EAT-26 is a questionnaire evaluating a variety of attitudes and behaviors directly related to eating disorders. It consists of 13 items assessing dieting, six items assessing bulimia and food preoccupation, and seven items assessing oral control. Each question is answered in a Likert scale (always [3], usually [2], often [1], sometimes [0], rarely [0] and never [0]). A total EAT-26 score more than or equal to 20 shows an abnormal eating behavior and possible eating disorders (Garner et al., 1982).

As far as the technical adequacy of the EAT-26 is concerned, acceptable discriminant and criterion validity (Garner et al., 1982) as well as internal consistency (Haase, 2009; Kosmidou et al., 2018, 2015) are reported. In this study, Cronbach's alpha values for the total EAT-26, dieting, bulimia and oral control subscales were found at .80, .79, .65 and .64, respectively. For the statistical analyses the total EAT-26 score was used.

Pressure for thin body by coaches, parents, peers and experts

In order to evaluate the pressure for thin body the athletes receive by "significant others", the questionnaire developed by Durkin, Paxton and Wertheim (2005) was used. The aforementioned authors assessed only parental and peer pressure; however, in this study the pressure by coaches and gymnastics experts (i.e., judges) was also measured, as Kosmidou et al. (2015) did in their study. So, two items for each "significant other" group were used to assess pressure to be thin, rated in a 5-point Likert scale (never [1], rarely [2], sometimes [3], often [4] and very often [5]), with higher scores indicating higher perceived pressure. Researchers having used the questionnaire report sufficient internal consistency of its subscales (pressure by parents/experts/coaches/peers) (Kosmidou et al., 2015, 2018), despite their limited number of items. In the current study, Cronbach's alpha was .87 for coach; .79 for parents; .69 for peers and .87 for experts.

Anthropometric characteristics

The athletes completed a questionnaire which included demographic and personal details such as age, weight and height. Participants' Body Mass Index (BMI) was calculated following the formula weight/height^2 (kgr/m^2). Then, BMI z-scores were computed and were used for the classification of the athletes into BMI categories (underweight, normal weight, overweight, obese), according to the World Health Organization guidelines (World Health Organization, 2007).

First, an informative meeting was held in sport clubs, in which the first author informed athletes about the purpose and the procedure of the study, and assured them that their participation would be voluntary and anonymous. In this meeting,

written consent forms for participation were given to athletes, who had to fill them out and sign on their own (if they were adults) or by their parents (if they were minors). One week later, the first author visited the sport clubs again and distributed the questionnaires at the end of the training. She also gave oral instructions on how to fill in the questionnaires and stayed there until their completion, available to answer any potential questions.

At a preliminary level, potential BMI differences between RG and AG athletes were investigated, using a t-test. Then, Pearson correlation coefficients were calculated to investigate the association between BMI and gymnasts' scores in the EAT-26, the SPAS and the Pressure for thin body Questionnaire. If statistically significant correlations were found, BMI should be controlled to reduce their potential impact on the analyses. The cut-offs provided by Cohen (1988) were utilized to estimate the strength of the statistically significant correlations ($r \leq .29$ indicates a weak correlation, $.30 \leq r \leq .39$ moderate, $.40 \leq r \leq .69$ strong and $r \geq .70$ a very strong correlation). The correlation analysis results revealed that BMI was statistically significantly correlated with (a) SPAS total score and (b) pressure for thin body by coaches, parents and experts subscales. There was no statistically significant correlation between BMI and EAT-26 score. According to the above, to check potential differences between RG and AG athletes a t-test was computed on EAT-26 scores, an analysis of covariance (ANCOVA) was utilized on SPAS scores, and a multivariate analysis of covariance (MANCOVA) was computed on the scores of the Pressure for thin body by coaches/parents/peers/experts subscales, using BMI as a covariate.

In the next step, since there were no statistically significant differences between the RG and AG athletes on the variables of interest, their data were merged and were further analyzed to check whether athletes' abnormal eating behavior was associated to their SPA and the perceived pressure by "significant others". Thus, athletes were classified as (a) presenting normal eating behavior (EAT-26 total score < 20) and (b) presenting DEAB (EAT-26 total score $\geq$20) and an ANCOVA was computed on SPAS scores, whereas a MANCOVA on pressure by coaches, parents, peers and experts, using BMI as covariate.

For the above statistical analyses the SPSS 24 for Windows statistical package was used and the level of significance was set at .05.

RESULTS

BMI associations with gymnasts' DEAB, SPA, and pressure for thin body

According to the t-test utilized, statistically significant differences were revealed between RG and AG athletes on their BMI ($t=5.20$, $p< .001$), with AG athletes presenting higher values. The correlation results revealed that BMI was statistically significantly correlated with SPA and pressure for thin body by coaches, parents and experts. Specifically, BMI had a moderate correlation with athletes' SPAS score; a strong correlation with pressure for thin body by coaches and parents and a moderate correlation with pressure by experts, whereas there was no correlation with pressure by peers. No other significant correlations were identified (Table 2).

Differences between RG and AG athletes

In Table 3, means and standard deviations of RG and AG athletes on the variables of interest are presented. The t-test utilized on EAT-26 scores showed that there were no significant differences between the two groups for DEAB ($t=1.23$, $p=.22$). Moreover, BMI was found to be a significant covariate both in the ANCOVA computed on SPAS scores ($F=10.52$, $p=.002$) and the MANCOVA applied on pressure for thin body by coaches/parents/peers/experts subscales

(Pillai's trace=.41, F=14.25, p<.001). However, the discipline of Gymnastics (RG vs AG) did not differentiate either gymnasts' SPAS score (F=0.17, p= .68) or the pressure they received by "significant others" (Pillai's trace=.07, F=1.69, p=.16).

Table 1
Participants' anthropometric characteristics.

	RG athletes	AG athletes	Total
Age (years)	13.25±2.13	14.43±2.53	13.90±2.42
Height (m)	1.53±.12	1.56±.09	1.55±.11
Weight (Kg)	38.70±9.73	44.68±7.30	41.99±8.94
BMI	16.14±2.07	18.05±1.38	17.19±1.96
BMI classification (%)			
Underweight	14.6%	2%	7.78%
Normal weight	85.4%	98%	92.22%

Table 2
Pearson r values of the correlations between athletes' BMI and variables of interest.

			Pressure for thin body from			
	EAT-26	SPAS	coach	parents	peers	experts
BMI	.186	.352*	.560*	.544*	.071	.358*

* p< .001

Table 3
Means and standard deviations on EAT-26, SPAS, and Press of thin body Questionnaire.

		RG athletes	AG athletes	Total
	EAT-26	15.57±11.69	18.32±9.39	17.08±10.51
	SPAS	19.52±6.00	21.16±6.06	20.42±6.06
Pressure for thin body by	coach	5.25±2.72	6.46±2.25	5.92±2.53
	parents	3.70±2.34	4.08±2.12	3.91±2.22
	peers	2.60±1.23	2.46±.93	2.52±1.07
	experts	4.47±2.41	5.38±2.28	4.97±2.37

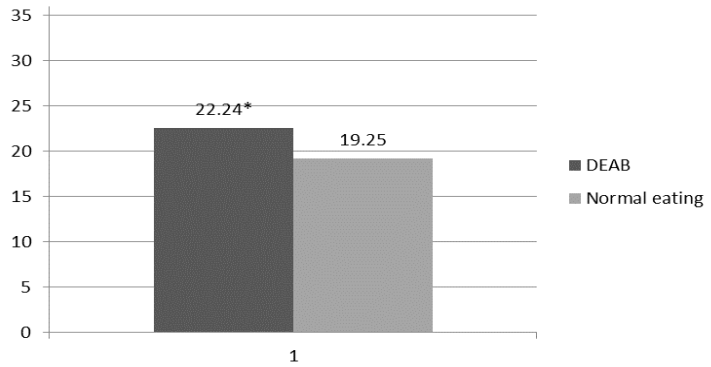

Figure 1. Total SPA scores per eating behavior category
(*Estimated marginal means are presented)

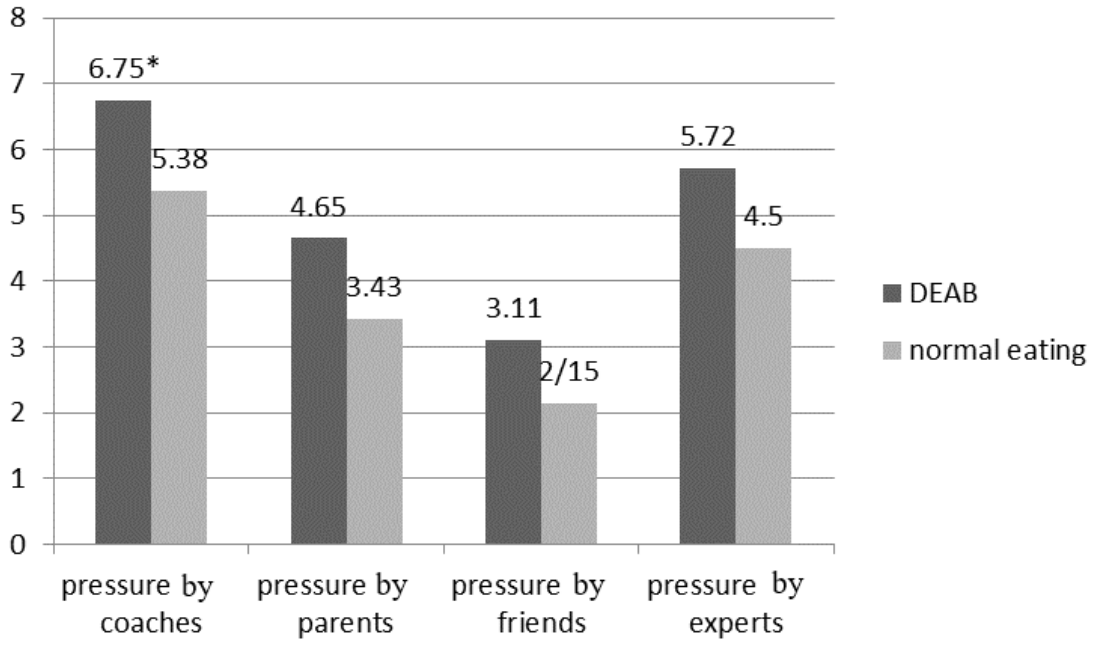

Figure 2. Perceived pressure by coaches, parents, peers and experts per eating behavior category (*Estimated marginal means are presented)

The univariate analyses of covariance that followed the MANCOVA showed that BMI associated significantly with the pressure the athletes received by their coaches (F=32.26, p< .001), parents (F=42.92, p< .001) and experts (F=9.03, p= .003), but not by peer pressure (F=1.16, p= .28), whereas significant differences between RG and AG athletes were revealed only on parents' pressure for thin body (F=5.46, p= .02) and not on coaches' (F= .17, p=.68), peers' (F=1.04, p= .31) and experts' (F=.04, p= .84).

Differences between gymnasts with and without DEAB

When the data of RG and AG athletes were merged into one group (gymnastics athletes), it was revealed that 40% of the total sample had a total EAT-26 score > 20, a result that indicates DEAB, whereas the remaining 60% presented normal eating attitudes/behaviors. The ANCOVA that applied on SPAS scores showed significant associations between gymnasts' SPAS scores and BMI (F=10.17, p= .002), whereas eating behavior (normal vs abnormal) significantly differentiated gymnasts' SPA (F=6.04, p= .02), with athletes presenting DEAB having higher SPAS scores (Figure 1).

Finally, regarding the perceived pressure for thin body, according to the MANCOVA results, BMI was found to be a significant covariate (Pillai's trace=.39, F=13.55, p<.001), whereas eating behavior significantly differentiated athletes' perceived pressure (Pillai's trace= .26, F=7.16, p<.001). From the univariate analyses that followed, it was revealed that there were significant differences between athletes with normal eating behavior and those with DEAB on the pressure they received by their coaches (F=9.59, p=.003), parents (F=9.56, p<.003), peers (F=20.16, p<.001) and experts (F=5.53, p=.012). As it can be noticed in Figure 2, athletes with DEAB receive higher pressure for thin body by "significant others" than their peers with normal eating behaviors.

DISCUSION

The purpose of the present study was to investigate DEAB, SPA and perceived pressure for a thin body by "significant others'', such as coaches, parents, friends and experts, in RG and AG female athletes at competitive level, while examining (and controlling) the potential effects of athletes' BMI.

BMI associations with gymnasts' DEAB, SPA and pressure for thin body

Results revealed that RG gymnasts' BMI was similar to that found in previous studies focusing on RG gymnasts (Kosmidou et al., 2015) and significantly lower than that of AG gymnasts of the current study. RG had a higher percentage of underweight athletes than AG. Moreover, athletes' BMI had a moderate correlation with their SPAS score, a finding that confirms the opinion of Gay et al. (2011), according to which in aesthetic sports, BMI can predict SPA, and a BMI increase can increase the possibility for higher SPA around 6%. Furthermore, in the present study, BMI had a strong correlation with perceived pressure for a thin body by coaches and parents, whereas its correlation with perceived pressure by experts was moderate. This result was expected as it is known that in gymnastics a specific body type is thought to be a prerequisite for performance or success (Cook & Hausenblas, 2011; Smolak et al., 2000). Kosmidou et al. (2015), in their study with RG gymnasts, found a weaker correlation between BMI and perceived pressure by parents ($r=.29$, $p=.042$), a similar correlation with pressure by coaches ($r=.52$, $p<.001$) and a much higher pressure by gymnastics experts ($r=.62$, $p<.001$).

The significant correlation between BMI and perceived pressure for a thin body found in this study requires attention, since it shows that the gymnasts with increased BMI (although lower than the BMI of their non – athletes peers) receive pressure to be thinner by "significant others". One can imagine how negatively an adolescent female gymnast experiences even a small weight gain.

Differences between RG and AG athletes

RG and AG gymnasts had similar EAT-26 mean scores (RG= 15.57; AG = 18.32, $p>.05$), which were in close agreement with those from the study of Kosmidou et al. (2015), who found EAT-26 total score of 16.27 in RG athletes. As far as gymnasts' SPA and perceived pressure to be thin are concerned, it was revealed that, when the effect of athletes' BMI was controlled, the two groups had similar SPAS scores; nevertheless, there were significant differences regarding the pressure for thin body by parents, with the AG athletes presenting higher scores than the RG athletes. It is interesting to note that the gymnasts of the present study, both RG and AG ones, felt like being more pressed to be thin by coaches, parents and experts than it was reported by RG athletes in the study of Kosmidou et al. (2015). Nevertheless, the current results of AG athletes cannot be compared to previous ones, as to our knowledge there is no previous research focusing on AG gymnasts. Taking into account that RG athletes receive pressure for a thin body from a very young age (Sample, 2000) and tend to have a thinner body compared to other kinds of gymnasts (Nordin, Harris, & Cumming, 2003), the current findings of higher pressure to be thin presented by the AG gymnasts are worrying. Nevertheless, they can be interpreted under the prism of the strong correlation found between athletes' BMI and parents' pressure for thin body in conjunction with the higher BMI presented by AG athletes.

Differences between gymnasts with and without DEAB

When the data of RG and AG athletes were merged it was revealed that DEAB had a high prevalence (40%) among the participants of this study. This percentage

is much higher compared to previous studies in which 26% (Kosmidou et al., 2015, 2018) up to 37.7% (Ferrand, Champely, & Filaire, 2009) of RG athletes and 30% of artistic and RG gymnasts (Theodorakou & Donti, 2013) were found to have DEAB. It is also similar to the percentage found in the study of Sundgot-Borgen and Torstveit (2004) in which, 42% of the female athletes of aesthetic sports (diving, synchronized swimming, artistic and rhythmic gymnastics) presented DEAB. Although it is well known that in aesthetic sports the athletes tend to show DEAB (Gay et al., 2011; Haase & Prapavessis, 2001; Sundgot-Borgen & Torstveit, 2004), due to the significant role physical appearance plays for success, the high DEAB percentage of the present study is alarming. Taking into account that DEAB can have a negative impact on both the performance (Costarelli & Stamou, 2009) and health of those young athletes (Chamay-Weber et al., 2005; Jacobi et al., 2004), the need of professional help to tackle the problem is imperative.

Moreover, it was revealed that gymnasts with DEAB presented higher SPA than those with normal eating attitudes/behaviors, a finding that is in agreement with previous studies (Gay et al., 2011; Haase & Prapavessis, 2001; Sundgot-Borgen & Torstveit, 2004). As far as the association between DEAB and perceived pressure for a thin body is concerned, gymnasts with DEAB presented higher perceived pressure for thin body by every "significant others" – group (coaches, parents, friends, experts) than the gymnasts without DEAB.

Several researchers refer to the important role of coaches in adolescent athletes' development (Fraser-Thomas & Côté, 2009), underlining that they are the most suitable people to influence athletes' eating behavior (Wheatley, Khan, Székely, Naughton, & Petróczi, 2012). However, the strong and positive correlation between the diet of elite gymnasts and the perceived pressure for a thin body by their coaches has been also noticed (de Bruin, Oudejans, & Bakker, 2007). As Petty and Cacioppo (1986) state, in RG, coaches argue for years with their athletes about controlling their weight and this kind of pressure can create serious problems to athletes' body image and body esteem. Several researchers (Heffner, Ogles, Gold, Marsden, & Johnson, 2003; Kerr, Berman & De Souza, 2006) point out that if coaches insist on believing that the low weight of their athletes is beneficial for their performance, their attitudes and behaviors can unintentionally lead their teenage athletes to be at risk for DEAB. In addition, according to the current results, young gymnasts perceived that they receive great pressure for a thin body from gymnastics experts (i.e., judges), a finding that shows the critical role of the judges for technical performance and the physique in athletes' weight control (Kerr et al., 2006).

Nevertheless, in the current study two other groups of "significant others", parents and friends, have been found to press young gymnasts to be thin. Regarding parents, it is known that since the peak of gymnasts' career comes during adolescence, their parents are closely involved in their daily routines, driving them to the sport club, accompanying them at competitions, etc, so they may be influenced by coach's behavior regarding dieting. As far as perceived pressure by friends is concerned, it can be assumed that the gymnasts who participated in the current study being at competitive level and spending a lot of hours in gymnastics training, had created friendships within the gymnastics club, with other gymnasts who also care about their thinness.

Limitations and strengths

This study presents some limitations that should be mentioned. To begin with, information regarding gymnasts' DEAB, SPA and pressure for thin body was gathered using self-reported questionnaires and that should be taken into account when

interpreting its results. Moreover, the cross-sectional design does not allow for examining causal relationships among the variables.

However, this study goes along with several strengths. First, it is the first one examining simultaneously DEAB, SPA and perceived pressure for thin body and controlling the effect of athletes' BMI, providing, in that way, valuable information about this important issue. Furthermore, this is the first study focusing on AG athletes, shedding light into their SPA, DEAB and perceived pressure for thin body by "significant others".

CONCLUSION

It is obvious that if gymnasts' DEAB is to be confronted, educating both athletes and "significant others" is essential. Several researchers (Cover, Hanna, & Barnes, 2012; Nagel, 2003; Thein-Nissenbaum & Carr, 2011) state that coaches should be informed about their athletes' DEAB so as to help them. Optimizing athletes' performance without sacrificing their health should be every coach's concern. Apart from coaches, everyone who is involved with female athletes should understand the negative consequences of their behavior on athletes' eating attitudes/behaviors. Moreover, it has been proved that an intervention aiming at the improvement of self-concept and dieting attitudes of gymnasts can have positive results, providing, in that way, a promising message in the direction of DEAB confrontation (Kosmidou et al., 2015). More interventions, including "significant others", must be carefully designed and implemented for the benefit of athletes' health, whereas further research of the factors that contribute to athletes' DEAB is needed.

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