

Revista de Psicología del Deporte  
2011. Vol. 20, núm. 2, pp. 367-382  
ISSN: 1132-239X

Universitat de les Illes Balears  
Universitat Autònoma de Barcelona

# Relationship between anthropometric variables and body image dissatisfaction among fitness center users

Vinicius Oliveira Damasceno\*, Jeferson Macedo Vianna\*\*, Jefferson Silva Novaes\*\*\*\*, Jorge Perrout de Lima\*\*, Helder Miguel Fernandes\*\*\* and Victor Machado Reis\*\*\*

## RELATIONSHIP BETWEEN ANTHROPOMETRIC VARIABLES AND BODY IMAGE DISSATISFACTION AMONG FITNESS CENTER USERS

KEYWORDS: Body image dissatisfaction, Body mass index, Body fat, Fitness center users

ABSTRACT: The purpose of this study was to identify the anthropometric dimensions related with body image dissatisfaction among fitness center users. Participants were 276 Brazilian members of fitness centers (168 males and 108 females) with ages between 17 and 39 years ( $M_{age} = 23.93$ ,  $SD = 5.17$ ). After body mass (BM), body mass index (BMI) and body fat (% BF) were measured, participants indicated their current (CS) and ideal (IS) silhouettes, allowing the calculation of body dissatisfaction as the difference between IS and CS. BMI and % BF were grouped by body dissatisfaction category and analyzed using one-way and repeated measures ANOVA. Results revealed that only 1.2 % of men and 6.5 % of women considered themselves satisfied with their body. Comparisons of global ratings of their CS and IS revealed that male and female individuals reported that their current bodies were significantly less muscular than their ideal bodies ( $p < .001$ ), although the degree of dissatisfaction revealed no significant difference between sexes. Moreover, results demonstrated that the relationship between body composition and body dissatisfaction only occurs in individuals that feel very dissatisfied with their body image and appearance.

Correspondencia: Helder Miguel Fernandes. Research Centre for Sports, Health and Human Development. Universidade de Trás-os-Montes e Alto Douro. Rua Dr. Manuel Cardona, 5000-558 Vila Real – Portugal. E-mail: hfernandes@utad.pt

\* University Salgado de Oliveira. Brazil.

\*\* Federal University of Juiz de Fora. Brazil.

\*\*\* Research Centre for Sports, Health and Human Development, University of Trás-os-Montes and Alto Douro. Portugal.

\*\*\*\* Federal University of Rio de Janeiro. Brazil.

— Fecha de recepción: 17 de Marzo de 2010. Fecha de aceptación: 3 de Febrero de 2011.

Body image can be defined as a multi-dimensional construct that describes an individual's internal representation of their body structure and physical appearance (Banfield and McCabe, 2002; Cash and Pruzinsky, 2002; Gleaves, Williamson, Eberenz, Sebastian and Barker, 2001; Hart, 2003). The construction of body image can be influenced by sociodemographic (e. g., age and gender), social (e.g., influence of the media and social support) and psychological factors (e.g., anxiety, self-esteem, stress, and body-related cognitive processes such as faith, values and attitudes towards a culture) (Blowers, Loxton, Grady-Flesser, Occhipinti and Dawe, 2003; Cash and Pruzinsky, 2002; Labre, 2002; Ricciardelli, McCabe and Banfield, 2000; Schooler, Ward, Merriwether and Caruthers, 2004; Thompson, Coovert and Stormer, 1999). Accumulated empirical evidence has demonstrated that dissatisfaction with body image has increased consistently in the last decades (Carron, Hausenblas and Estabrooks, 2003).

Frequent exposure to ideal images of men and women in the media is known to be a major influence on body image in both sexes (Blowers et al., 2003; Leit, Gray and Pope, 2002). Influences on the drive for muscularity among women are not yet well documented, apart from the decreased body mass index (BMI) and increased waist-to-hip ratio preferences reported for women photographed for Playboy magazine during the last two decades (Voracek and Fisher, 2002).

A strong cultural trend of thinness as the ideal body for women (Damasceno, Dutra, Vianna, Novaes and Lima, 2002; Fernandes et al., 2003; Fitzgibbon, Blackman and Avellone, 2000; Kim and Lennon, 2007; Sigall and Pabst, 2005; Voracek and Fisher, 2002) and a large, muscular and strong body for men (Choi, Pope, Olivardia and Cash,

2002; Damasceno, Lima, Vianna, J. M., Vianna, V. R. and Novaes, 2005; Leone and Fetro, 2007; Orlando, Teixeira, Menezes, Trindade and Lima, 2002; Pope et al., 2000; Pope, Gruber, Choi, Olivardia and Phillips, 1997; Pope, Olivardia, Gruber and Borowiecki, 1999; Pope, Phillips and Olivardia, 2003; Yang, Gray and Pope, 2005) has gained momentum over recent decades. The disagreement between the perception of an individual's current body dimensions and the cultural ideal body causes preoccupation, dissatisfaction and body change behaviors, such as dieting and exercise (Blowers et al., 2003; Sigall and Pabst, 2005), use of performance-enhancing substances, higher levels of depression, as well as lower self-esteem (Kanayama and Pope, 2001; Olivardia, Pope, Borowiecki and Cohane, 2004), which in extreme cases may lead to the adoption of self-destructive behaviors, such as the abuse of diets that may culminate in anorexia or bulimia nervosa (Giordani, 2006; Zabinski, Calfas, Gehrman, Wilfley and Allis, 2001) .

A significant proportion of people adheres to fitness centers so they can exercise and achieve the aesthetic and stereotyped standards promoted by cultural norms (Blowers et al., 2003; Cattarin, Williams, Thomas and Thompson, 2000; Sigall and Pabst, 2005). According to Novaes (1998), those that adhere to fitness centers' programs usually report body image goals based on weight loss, body shape, muscularity, and low body fatness achievement. At these centers, health-related and fitness professionals, such as personal or group trainers, usually assess their client's purpose of ideal body and translate it into anthropometric measures in order to develop their intervention. Sets of silhouette-based forms representing pictures of body shapes are often used as instruments to evaluate the client's current and ideal body shape (Cash and

Pruzinsky, 2002; Damasceno, Dutra, Silva, et al., 2001; Damasceno, Dutra, Vianna, et al., 2002; Damasceno, Lima, et al., 2005; Fernandes et al., 2003; Hildebrandt, Langenbucher and Schlundt, 2004; Orlando et al., 2002; Stunkard, Sorenson and Schlusinger, 1983). These procedures allow the measurement of body dissatisfaction through the size of the discrepancy between the current and ideal silhouette. According to this method, dissatisfaction can be determined by the divergence of current perceptions of body dimensions and the desired ideal image, which is an assumption of self-discrepancy theory (Higgins, 1987) that states that people are motivated to reduce the gap between these self-state discrepancies.

Using a set of silhouettes proposed by Stunkard et al. (1983), it was found that 85 % of physically active individuals were dissatisfied with their body. More recently, Damasceno et al. (2005) reported that Brazilian men, who were regular walkers, idealized a body with about 23 kg/m<sup>2</sup> and 10 % fat, while women preferred a body with about 20 kg/m<sup>2</sup> and 20% fat. However, as these silhouettes do not distinguish body fat level from muscularity, they are insufficient to study body dissatisfaction among members of fitness centers, particularly males. In these centers, it is well known that people aim to increase muscularity and decrease body fat.

Therefore, the purpose of the present study was to examine the body dissatisfaction of fitness center users and its relationship to body composition, using simultaneously measures of fat and muscularity.

## Method

### Sample

Participants were 276 male ( $n = 168$ ) and female ( $n = 108$ ) healthy individuals aged

between 17 and 39 years ( $M = 23.93$ ,  $SD = 5.17$ ) who were members of three Brazilian fitness centers for at least 6 months. Subjects were excluded from the study if they presented any type of pathology such as cancer, endocrinological diseases and muscular problems, since it is known that these diseases could interfere with the perceptual processes of body image (Cash & Prunzisky, 2002). The study fulfilled the requirements of the Brazilian National Healthy Council Resolution n° 196/96, and was approved by the ethics committee of a Brazilian (Rio de Janeiro) university. All participants were unpaid volunteers.

### Instruments

**Anthropometric measures.** Body mass (weight) was measured using a digital scale, by Filizola®, properly checked and approved by INMETRO (Brazilian Agency of Metrology, Normatization and Industrial Quality). Height was measured with 1 mm precision by a stadiometer attached to the scale. Body mass index (BMI) was calculated using the equation of weight (kg) divided by height squared (m<sup>2</sup>). Thorax, triceps, suprailiac, abdominal and thigh skin folds were measured using skin fold calipers by Lange®. Body fat percentage (BF%) was estimated through previous suggested equations (Jackson and Pollock, 1978; Jackson, Pollock and Ward, 1980).

**Measures of Body Image.** Participants completed a set of sex-adapted silhouettes forms from Frederick et al. (2007) which has proven to have good psychometric properties, such as cross-cultural validity and internal consistency and test-retest reliability (see Figure 1).

Separate fat and muscle silhouette measures were horizontally aligned allowing

body image ratings between the lowest (fat) and the highest value (muscle), being the central silhouette the thinnest (merging silhouette between the fat and muscle measures). The images of the set of silhouettes were numbered between -7 (fat) and 7

(muscle), allowing participants to rate their current silhouette (CS), which best represents their current physical appearance, and their ideal silhouette (IS), which represents the body they would most like to possess or the body they think others find most attractive.

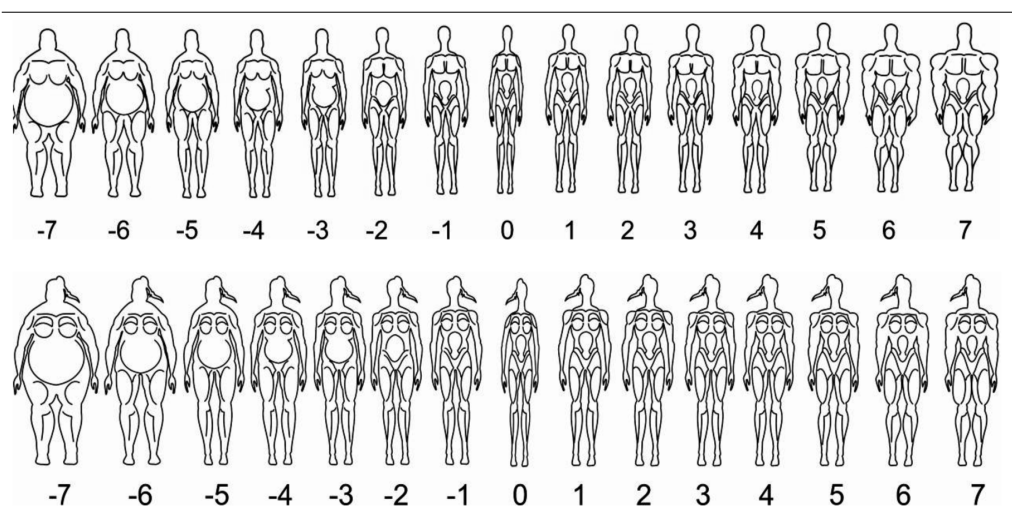


Figure 1. Sex-differentiated silhouette measures.

Body dissatisfaction was estimated as the difference between IS and CS (IS-CS), allowing the definition of three categorized levels based on quartiles analyses: low dissatisfaction = first quartile (below or equal value 1); median dissatisfaction = second and third quartiles (between values 2 and 4); and high dissatisfaction = fourth quartile (equal or above value 5).

### Procedures

Initially, verbal consent was obtained from the directors of the fitness centers. Then, participants were recruited by posted invitations and flyers. After the screening for possible pathologies, participants were

informed about the research purposes and signed an informed consent. All measurements occurred before a training session. After completing a brief demographics survey, participants were shown the silhouette measures and rated their CS and IS. All anthropometric measures were then performed according to standardized protocols (Eston and Reilly, 2009).

### Statistical Analysis

Descriptive values are presented as mean ( $M$ ), standard deviation ( $SD$ ) and relative frequency (%). Skewness and kurtosis coefficients were computed for univariate normality analyses purposes, and all values



were within  $\pm 1$ . The BMI and BF% were analyzed by dissatisfaction category and one-way and repeated measures ANOVA (Scheffe Post-Hoc) were used to test between and within-group differences. In addition, paired-samples t tests were used to determine the difference in body dissatisfaction separately by sex. Individual scores of

BMI and BF% were plotted in function of dissatisfaction and fitted by two linear equations in order to identify turning points in the relation between anthropometric measures and dissatisfaction. Data was analyzed using Statistica® 6.0 and SPSS® 16.0. The statistical significance was set at  $p < .05$ .

	Total (N = 276)			Men (n = 168)			Women (n = 108)		
	M	SD	%	M	SD	%	M	SD	%
Body mass (kg)	69.8	14.6		77.8	11.7		57.5	8.7	
Height (cm)	172.3	9.8		178.0	2.1		163.1	2.0	
BMI (kg/m <sup>2</sup> )	23.3	3.4		24.5	3.2		21.5	2.8	
BF%	15.5	7.6		11.6	5.8		21.6	5.8	
Current Silhouette	.25	2.67		.73	2.80		-.48	2.30	
Ideal Silhouette	3.58	1.83		4.15	1.67		2.69	1.71	
Body Dissatisfaction	3.33	2.51		3.43	2.61		3.17	2.34	
Weekly PA frequency									
1 to 3 times			14.5			8.9			23.1
4 to 5 times			76.8			81.6			69.5
6 or more times			8.7			9.5			7.4
Weekly PA time									
60 to 90 m			49.6			52.4			45.4
90 to 120 m			46.7			46.4			47.2
more than 120 m			3.7			1.2			7.4
Exercise goals									
Hypertrophy			54.3			72.6			25.9
Lose weight			43.5			25.6			71.3
Health issues			2.2			1.8			2.8

Table 1. Descriptive analysis of total sample and by sex.

## Results

Participants included 276 subjects (168 males and 108 females), with a mean age of  $23.93 \pm 5.17$  years ( $M_{age}$  for males =  $23.35 \pm 4.78$ ;  $M_{age}$  for females =  $24.83 \pm 5.63$ ). Body mass ranged from 55.0 to 122.0 kg in the male group and from 43.0 to 104.0 kg in females. Body fat percentage ranged from very underweight (male = 2.4 %; female = 10.2 %) to severely obese (male = 35.8 %; female = 39.1 %). These wide-ranging body

dimensions were associated to CS variations from -6 to 6 (range = 12) in males and from -5 to 4 (range = 9) in females (see Table 1, for other descriptive data).

When analyzed the CS variation according to BMI (Figure 2) and BF% (Figure 3), data reveals that more negative CS silhouettes are consistently reported by fitness center users with higher BMI and BF%, while silhouette number 0 (thinnest) was mainly rated by individuals with lower BMI and BF%.

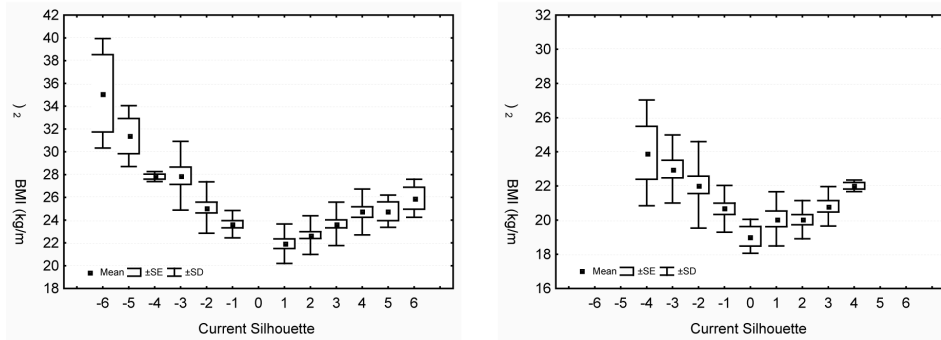


Figure 2. Box plot of body mass index by current silhouette of male (left side) and female (right side).

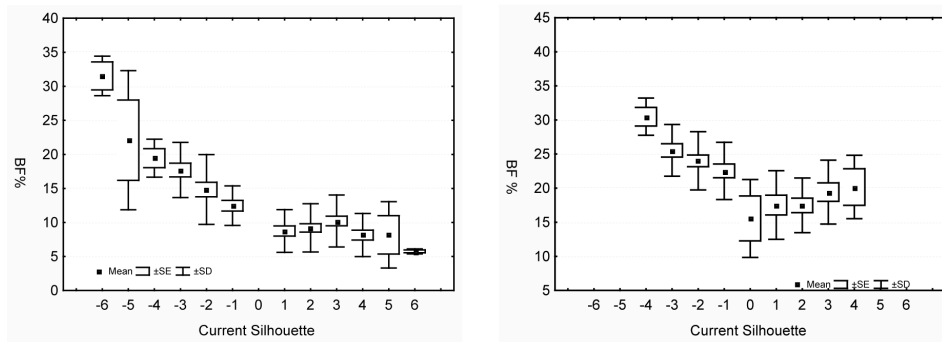


Figure 3. Box plot of body fat by current silhouette of male (left side) and female (right side).

Additionally, men and women who rated themselves on more muscularity silhouettes had also higher BMI and BF%, with the exception of BF% for males, which remained rather stable.

Male individuals mainly identified their current body shape as silhouette number 1 ( $M = .73$ ,  $SD = 2.80$ ), while desired to look like silhouette number 4 ( $M = 4.15$ ,  $SD = 1.67$ ). According to data from CS, silhouette 4 corresponds to  $24.7 \pm 2.0$  kg/m<sup>2</sup> and  $8.1 \pm 3.2$  BF%. Female individuals identified themselves as silhouette numbers -1 to 0 ( $M = .48$ ,  $SD = 2.30$ ) but tended to chose silhouette number 3 ( $M = 2.69$ ,  $SD = 1.71$ ), as this ideal silhouette corresponds to  $20.8 \pm 1.1$  kg/m<sup>2</sup> and  $19.4 \pm 4.7$  BF%.

One-way within-subjects ANOVA compared global ratings of their CS and IS, and revealed that individuals reported that their current bodies were significantly less muscular than their ideal bodies,  $F(1, 1429) = 454.95$ ,  $p < .001$ , though this was a large effect ( $\eta_p^2 = .62$ ). Subsequent paired-samples t test reveals the same pattern of findings for male,  $t(167) = -17.05$ ,  $p < .001$ ) and female,  $t(107) = -14.05$ ,  $p < .001$ ), while the degree

of male and female dissatisfaction comparison revealed no significant difference,  $F(1, 274) = .72$ ,  $p > .05$ .

Correlation results revealed that, both for male and female, body dissatisfaction is more correlated with BF% ( $r(168) = .63$ ,  $p < .001$  and  $r(108) = .38$ ,  $p < .001$ , respectively), than with BMI ( $r(168) = .60$ ,  $p < .001$  and  $r(108) = .29$ ,  $p < .001$ , respectively).

Afterward, the subjects were assigned to three groups according to their dissatisfaction level (quartiles analyses). Table 2 presents the comparison of anthropometric measures by the three male dissatisfaction groups.

There was no difference in mean height, but the mean body mass (84.9 kg), BMI (27.0 kg/m<sup>2</sup>) and body fat (16.9 %) of the high dissatisfaction group were higher than those of the other two groups.

The mean values for females are presented in Table 3.

There was no difference in mean height but mean body mass (60.4 kg) and body fat (24.1 %) of the high dissatisfaction group was greater than the low dissatisfaction group. BMI (22.7 kg/m<sup>2</sup>) of the high dissatisfaction group was also higher than that of the other groups.

	Low ( $n = 37$ )		Median ( $n = 84$ )		High ( $n = 46$ )		$F$	$\eta_p^2$
	$M$	$SD$	$M$	$SD$	$M$	$SD$		
Height (cm)	178.1	6.3	178.2	7.7	177.3	6.7	.22	.00
Body mass (kg)	76.1	6.7	74.5	9.7	84.9	14.8	14.47***	.15
BMI (kg/m <sup>2</sup> )	24.0	1.6	23.4	2.4	27.0	4.1	24.48***	.23
Body Fat (%)	9.2	4.0	9.7	3.9	16.9	6.5	39.64***	.33

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 2. Male anthropometric characteristics differentiated by dissatisfaction level.

	Low (n = 27)		Median (n = 52)		High (n = 29)		F	$\eta_p^2$
	M	SD	M	SD	M	SD		
Height (cm)	163.6	5.4	163.8	7.0	162.8	6.3	.22	.00
Body mass (kg)	54.7	4.1	57.3	9.6	60.4	9.5	3.14*	.06
BMI (kg/m <sup>2</sup> )	20.4	1.4	21.3	3.1	22.7	2.8	5.28**	.10
Body Fat (%)	18.5	4.9	21.8	6.1	24.1	4.6	7.49**	.13

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 3. Female anthropometric characteristics differentiated by dissatisfaction level.

To further test the relationship between body dissatisfaction and anthropometric variables, individual scores of BMI and BF% were plotted in function of dissatisfaction and fitted by two linear equations in order to identify turning points (see Figure 4 for male and Figure 5 for female). For both gender and measures, the turning points were determined at dissatisfaction level 4 (third

quartile). Below this point, no significant correlations were observed between body dissatisfaction and anthropometric measures. Above this point, positive and significant correlations were observed. For males, the turning point of BMI was 23.5 kg/m<sup>2</sup>,  $r(47) = .77, p < .001$ , and for BF% was 10.0 %,  $r(47) = .55, p < .001$ . For females, the turning point for BMI was 21.0 kg/m<sup>2</sup>,  $r(28) = .38, p < .05$ , and for BF% was 20.5 %,  $r(28) = .58, p < .01$ .

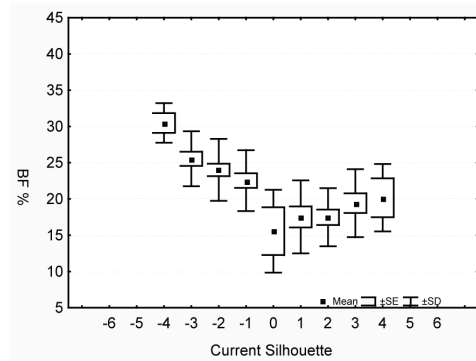
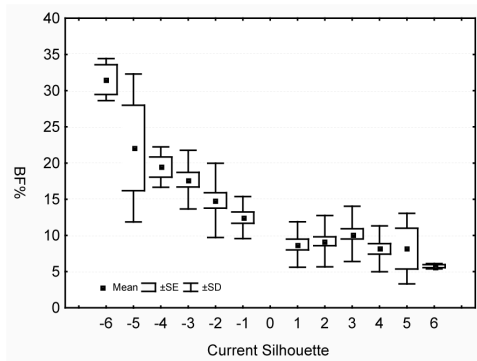


Figure 4. Body mass index (left side) and body fat (right side) by dissatisfaction of male subjects

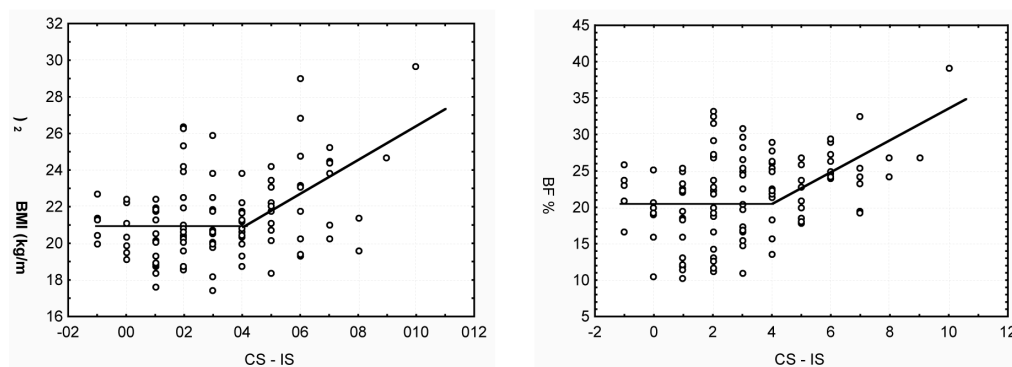


Figure 5. Body mass index (left side) and body fat (right side) by dissatisfaction of female subjects.

## Discussion

The present study aimed to describe the association between body dissatisfaction and anthropometric measures among fitness center users.

It was found that men's discrepancy scores (IS–CS) were all positive, in the direction of muscularity, while women also desired silhouettes which represented a thinner body, which is consistent with previous empirical evidence (Cachelin, Rebeck, Chung and Pelayo, 2002; Cash and Pruzinsky, 2002; Damasceno, Dutra, et al., 2002; Damasceno, Lima, et al., 2005; Fernandes et al., 2003; Fitzgibbon et al., 2000; Hildebrandt et al., 2004; Labre, 2002; Leit et al., 2002; Orlando et al., 2002; Pickett, Lewis, Cash and Pope, 2005; Pope et al., 2000; Voracek and Fisher, 2002; Yang et al., 2005). The ideal silhouette most commonly reported by men and women was both stronger and leaner than previous research that applied traditional silhouettes, entailing the need of using simultaneously measures of fat and muscularity.

The mean size for discrepancy between current and ideal silhouette was quite large for men ( $M = 3.43$ ) and women ( $M = 3.17$ ), although no significant differences were observed between sex groups for this variation. The finding of high levels of body dissatisfaction for men and women with no significant difference between genders is not according to some previous research. Previous studies (e.g., Araújo, D. S. and Araújo, C. S., 2003; Cachelin et al., 2002; Pingitore, Spring and Garfield, 1997) consistently demonstrated higher levels of body dissatisfaction in women. Furthermore, Loland (1998) while studying a sample of 1,555 male and female Norway subjects found that women were significantly more dissatisfied with their appearance than men, irrespective of age and physical activity levels.

The range of participants' body fat originated a wide spread of ratings across almost all fifteen categories of the silhouette measures, with low relative frequencies in the extremes (very fat or very strong). Being a sample predominantly young and lean, it could be assumed that the majority of

individuals would consider themselves (very) satisfied with their body image. Nevertheless, despite having healthy BMI levels, almost all individuals were dissatisfied with their body (98.8 % for male and 93.5 % for female). Thus, some authors argue that individuals who are engaged in activities offered by fitness centers are leaning to very high standards of muscularity, as there is a known association between physical activity goals and high levels of body (dis)satisfaction (Loland, 1998, 2000; Williams and Cash, 2001; Zabinski et al., 2001). In some cases, this excessive concern about physical appearance may result in negative consequences such as the thinness cult or anorexia in women (Giordani, 2006; Grogan, 2008; Zabinski et al., 2001) and muscle dysmorphia or reverse anorexia in men (Choi et al., 2002; Leit et al., 2002; Leone and Fetro, 2007; Pope, Gruber, Choi, et al., 1997; Pope, Olivardia, et al., 1999; Pope, Gruber, Mangweth, et al., 2000; Pope, Phillips, et al., 2003; Yang et al., 2005). Such evidence is according to self-discrepancy theory assumption that different types of discrepancies between self-state representations are related to different emotional vulnerabilities (Higgins, 1987). Therefore, while exercise history was not evaluated for the present sample beyond the period of six months, it is not possible to determine if the wide spread of ratings are related to the fact that these individuals recently adhered to fitness centers or if they pursue the (utopian) achievement of a cultural ideal body image.

Comparative and correlation analyses revealed that, both for men and women, BF% values appeared as the measure that had a higher association with body dissatisfaction levels. It is commonly reported that a high BMI, high BF% and overweight or obese status are usually

correlated with high levels of body dissatisfaction in adolescents and adults of both sexes (Hanley et al. 2000; Heywood & McCabe, 2006; Monsma and Malina, 2004; Schooler et al., 2004; Tanaka, Itoh and Hattori, 2002), justifying the importance of these anthropometric variables on body image (dis)satisfaction enhancement.

In the present study, the relationship between body dissatisfaction and anthropometric variables was analyzed in two different ways. By dividing the subjects into three levels of body dissatisfaction, it was found that body fat and body mass index had the higher effects on discriminating body dissatisfaction levels, indicating its contribution to the discrepancy of self-state representations (Fitzgibbon et al., 2000; Frederick et al., 2007; Stewart, Benson, Michanikou, Tsiota and Narli, 2003). Secondly, in plotting body mass index and body fat against dissatisfaction, it was found that there was no correlation between anthropometric variables and dissatisfaction until body dissatisfaction reached a median discrepancy value of four (third quartile). Above this point, we identified positive and significant correlations between those variables for both sexes, which indicate that this category value acts as a turning point on the relationship between the anthropometric variables measured (BMI and BF%) and body dissatisfaction.

Traditional sets of silhouettes for body dissatisfaction assessment usually present a series of bodies' figures ranging from very thin to obese. On the other hand, other silhouette scales have been recently developed, offering new assessment procedures. However, some limitations have also been identified regarding the measure of increases in muscularity alone (Orlando et al., 2002), low reliability (Cafri, Roehrig and Thompson,

2004; Cafri and Thompson, 2004) or a restricted application in exercise groups such as bodybuilders (Hildebrandt et al., 2004). In the present study, the silhouettes increased simultaneously in body fat and muscularity, so that a negative discrepancy score indicated a desire for a change in fatness and a positive discrepancy score indicated a desire for a change in muscularity. With this kind of instrument, it is possible to study the desire for body change in terms of both fatness and muscularity, which allows individuals to choose the body shape they really want to achieve or they think others find most attractive (Frederick et al., 2007).

It was expected that this population would have high levels of dissatisfaction, as it is known that fitness center users exercise with the purposes of muscle hypertrophy and body fat reduction, so they can improve their aesthetic appearance (Blowers et al., 2003; Cattarin et al., 2000; Novaes, 1998; Sigall and Pabst, 2005). The increased desire for muscularity among the present female sample may suggest that women may be also accepting the cultural standards of muscularity that have been previously imposed only on men. In this particular population, the socially accepted standards for men and women may have progressed to a shared desire for a thin, but muscular appearance (Grogan, 2008; Voracek and Fisher, 2002), although subsequent research is needed in order to clarify this assumption.

Some practical implications can be suggested, based on these results. First, we observed higher levels of body dissatisfaction among regular fitness exercisers (adherence > 6 months). Compared with the main motives for continuing exercising for male (hypertrophy) and female (lose weight), as well as the weekly physical activity duration, it appears that the degree of physical effort is

not being sufficient to achieve the “ideal” body desired by these fitness exercisers. Such situation might create an environment where failure is the most probable outcome and where these individuals can develop a pathological preoccupation with their muscularity – body dysmorphic disorder (Pope, Gruber, Choi, et al., 1997; Pope, Olivardia, et al., 1999). Therefore, fitness leaders (personal and group trainers) should be aware of this evidence and develop appropriate strategies in order to design exercise programs adjusted to the individual’s expectations and goals. Additionally, fitness leaders should also be aware that their beliefs and expectations about body-related aspects can have negative effects on fitness clients who have weight and body image concerns (Philips and Drummond, 2001).

Second, consequent implications also emerge from this “excessive” emphasis on aesthetic appearance. Since anthropometric measures are easily evaluated and fitness contexts promote body shape comparisons, it is important that a “looking healthy” message does not suppress a “being healthy” message across these settings. Therefore, specific exercise programs focusing on health and well-being should be developed and encouraged in order to rectify the look-oriented emphasis of the fitness industry. An exercise psychologist would play a central role in such a necessary multidisciplinary team because it would bridge the gap between the individual’s expectations and goals, and his health needs (e. g., reduce disease risk factors or unhealthy behaviors).

Some limitations should be considered regarding the obtained results. Firstly, this is a cross-sectional study and, therefore, causal inferences should not be made. Secondly, and although a regular exerciser sample was recruited, the history of physical activity and

related motives for continuing exercise were not appropriately collected. Therefore, future studies should address the influence of these factors on body satisfaction among fitness center users, as well as other factors. Lastly, the present study involved a preliminary use of the fat and muscle silhouette measures. Future research should verify its psychometric properties within different groups or settings.

## Conclusions

Results indicated that fitness center users reported high body dissatisfaction levels since only 1.2% of males and 6.5% of females were satisfied with their body appearance. Both sexes reported, similarly, a

preference for a stronger body (muscularity). The plotting results of BMI and BF% in function of body dissatisfaction revealed that positive and significant correlations between these variables were only observed beyond the dissatisfaction discrepancy value of four (third quartile). This corresponded to a BMI of 23.5 kg/m<sup>2</sup> and 10.0 BF% for men and a BMI of 21.0 kg/m<sup>2</sup> and 20.5 BF% for women.

Overall, our findings allowed the identification of high body dissatisfaction levels among Brazilian fitness center users and demonstrated that the relationship between body composition and body dissatisfaction, for this sample, only occurs on individuals that feel very dissatisfied with their body image and appearance.

### *RELACIÓN ENTRE LAS DIMENSIONES ANTROPOMÉTRICAS Y LA INSATISFACCIÓN CON LA IMAGEN CORPORAL EN USUARIOS DE CENTROS DE FITNESS*

**PALABRAS CLAVE:** Insatisfacción con la imagen corporal, Índice de masa corporal, Porcentaje de grasa corporal, Socios de gimnasios

**RESUMEN:** En este trabajo se estudió la relación entre las dimensiones antropométricas y la insatisfacción corporal en socios de gimnasios. Los participantes fueron 276 personas de Brasil socios de centros de fitness (168 varones y 108 mujeres) de una edad comprendida entre los 17 y 39 años ( $M = 23.93$ ,  $SD = 5.17$ ). Después de la medición de la masa corporal (MC), del índice de masa corporal (IMC) y de la porcentaje de grasa corporal (% GC), los participantes indicaron las siluetas más semejantes a su apariencia corporal (silueta real – SR) y a su apariencia corporal ideal (silueta ideal – SI), lo que permitió el cálculo de la insatisfacción corporal como la discrepancia entre la SI y la SR. IMC y % GC fueron agrupados por categorías de insatisfacción corporal y analizados por medio de ANOVA univariada y de medidas repetidas. Los resultados revelaron que sólo 1.2% de los hombres y 6.5% de las mujeres se consideraban satisfechos con su cuerpo. Las comparaciones de las SR por sexo indicaron que los hombres y mujeres consideran sus actuales SR significativamente menos corpulentas que las SI ( $p < .001$ ), aunque el grado de insatisfacción fue semejante en ambos sexos. Además, los resultados demostraron que la relación entre la composición corporal y la insatisfacción corporal sólo se demuestra en personas que se sienten muy insatisfechas con su imagen y apariencia corporal.

### *A RELAÇÃO ENTRE VARIÁVEIS ANTROPOMÉTRICAS E INSATISFAÇÃO COM A IMAGEM CORPORAL EM UTENTES DE GINÁSIOS*

**PALAVRAS-CHAVE:** Insatisfação com a imagem corporal, Índice de massa corporal, Gordura corporal, Utentes de ginásios

**RESUMO:** O objectivo do presente estudo foi identificar as dimensões antropométricas relacionadas com a insatisfação com a imagem corporal em utentes de ginásios. A amostra foi constituída por 276 indivíduos brasileiros (168 homens e 108 mulheres) com idades compreendidas entre 17 e 39 anos ( $M = 23.93$ ,  $DP = 5.17$ ). Após a mensuração da massa corporal (MC), índice de massa corporal (IMC) e gordura corporal (% BF), os participantes indicaram qual a silhueta que melhor representava a sua aparência actual (AA) e a sua aparência ideal (AI), permitindo o cálculo da insatisfação corporal através da diferença entre AI e AA. O IMC e a % GC foram agrupados por categorias de insatisfação corporal e analisados através de



ANOVA univariada e de medidas repetidas. Os resultados revelaram que apenas 1.2% dos homens e 6.5% das mulheres se consideravam satisfeitos com o seu corpo. As comparações dos valores de AA revelou que os indivíduos do sexo masculino e feminino preferiam que os seus corpos fossem mais musculados ( $p < .001$ ), embora o grau de insatisfação não tenha diferido entre sexos. Além disso, os resultados demonstraram que a relação entre a composição corporal e a insatisfação corporal só se denota em indivíduos que se sentem muito insatisfeitos com sua imagem/aparência corporal.

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