Original article

Eating behaviour and body image in a sample of young athletes

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Abstract. *Background and Aim:* Adolescence is a period of great risk for the development of eating disorders since many teenagers engage in long periods of dieting or exhausting sports activities in ordert to achieve their ideal body image. Research has shown that a potential majority of athletes display attitudes very similar to those observed in cases involving disturbed eating behaviour, particularly with regard to their exaggerated attention to their body image and the type of diet that they consider necessary for their activities. The aim of this study is to analyze young athletes dedicated to attaining the mesomorphic physical ideal and to identify possible dysfunctional eating habits like risk factors in the development of more serious disturbances. We further plan to evaluate possible differences in how members of the sample group perceive their bodies and behave in connection with their diet. *Methods:* The sample is made up of 109 males and females, aged 16-24 years. Participants completed the Pisa Survey for Eating Disorders and underwent measurements for the calculation of body mass index (BMI). *Results:* The young athletes in our sample show a markedly distorted perception of their own bodies. They show a widespread presence of eating behaviour that is not functional to high althletic achievement as well as a series of noteworthy risk factors connected with the onset of eating behaviour disturbances. *Conclusions:* The obtained results underscore the need for primary projects in prevention against and awareness of eating problems and awareness of dysmorphic and phobic disturbances in young athletes. (www.actabiomedica.it)

Key words: eating behaviour, body image and sport, adolescence

Introduction

Adolescence is considered a period at great risk with regard to the development of eating disorders, in that great and relatively sudden changes that take place during that period in many aspects of an individual's life, above all with reference to physical development (1-5). In the Western world today, adolescents' evaluation of themselves highly depends on how far their body images vary from the ideals put forward by advertising, the cinema, or television. It follows that a young person feels the need to acquire all those features that are in one way or another promoted by the mass media, to which other elements are added connected to the expectations promoted to a greater or a lesser degree by family members and peers. In fact, the images put forward by the mass media present an ideal body that is often a source of disappointment and discouragement for those whose physiques are far from matching these ideals. As it can be seen in the literature (6, 7), these images influence girls above all. Girls more frequently see themselves as overweight than do the boys, whereas in boys a greater sense of dissatisfaction is to be found in their height or lack of muscular development.

With regard to body types, Andersen (8) underlines a substantial difference between magazines for girls and those for boys: whereas girls' magazines emphasize diet and a slim, skinny figure, there is an increase in magazines and articles for boys that highlight physical fitness and body building. Therefore many teenagers fall back on long periods of dieting and exhausting sports activity in order to attain their ideal body image, with the risk of striking up eating habits that are abnormal (binging) or disorganized (large and frequent snacks at all hours of the day and night). In serious cases, the teenagers attempt to cope by inducing vomiting or by using laxatives (7).

Furthermore, a great deal of research has shown that perhaps even the majority of athletes exhibit attitudes that are very similar to those displayed in eating disorder cases, in particular with regard to the attention they dedicate to the personal body image and the dietary procedures that they consider necessary in their activities. According to the research by Thiel et al. (9) the athletes most at risk are those involved in sports in which body weight influences performance (such as wrestling, horse racing, canoeing, long distance running, and body building), while Yates et al. (10) singled out common socio-cultural and personality traits in a group of marathon runners and another group of anorexic males. These data encouraged us to carry out the present research, concentrating on understanding the distortion of body image, as well as the problems connected with male eating behaviour and the possible differences between the two sexes.

In this way, our research aims not only to take a deeper look at subject matter that has been largely unexplored up to now, but also to serve as a possible stepping stone toward better understanding the etiology of these 'behavioural distortions' and their connected factors.

Aims of the work

It follows that this study aims to evaluate a number of parameters to be found in young people dedicated to achieving the mesomorphic physical ideal, as well as to investigate possible dysfunctial eating habits that might be considered as risk factors for the development of more serious disturbances. The research also proposes to evaluate any possible gender differences in body perception and in eating behaviour present in the sample under scrutiny.

Sample

A consecutive examination was performed on 109 adolescent subjects of both sexes taken from and evaluated in three different places: a private gym, a gym belonging to a student sports centre, and a state scholastic institute in Genoa.

Criteria for inclusion in the sample:

- Age between 16 and 25 years inclusive
- Practicing sports activities at least three times a week for a minimum of 45 consecutive
- minutes per training session

The sample is made up of 59 males (54.1%) and 50 females (45.9%) between the ages of 16 and 24 years (MA = 18.11 ± 1.95).

Methods

All participants were asked to fill out a psychological test, the Pisa Survey for Eating Disorders, PSED[1], and to undergo objective weight and height measurement in order to calculate their BMI.

As we have already mentioned, the PSED evaluates behavioural and perceptive aspects relating to body image and gives indications concerning functional or dysfunctional eating habits. More specifically, the PSED is a questionnaire made up of 41 items with different types of questions or statements to be confirmed or denied (Yes/No) and requests for information to be evaluated on a specific scale (generally with reference to the frequency of certain types of behaviour, how much pleasure they give, the degree of intensity, etc.).

Generally speaking, the questionnaire provides an evaluation in four specific areas:

1. **Interpersonal relationships** – personal and sexual relationships and social contacts

[1] A self-administrated questionnaire for the determination of eating habits and self image

2. **Body image** – relationship with your own body, how much pleasure it gives you, and your perception of yourself
3. **Eating behaviour** – dieting, binging, self-induced vomiting and use of laxatives
4. **Physical activity** – type of activity carried out and frequency

Procedures and administration

The PSED was administered in the following Genoese centres: a private gym (Body Line Center), a gym in a large private school-sports structure (Pala Don Bosco) and a state-run high school (Martin Luther King). The two gyms and the school allocated rooms (surgeries) for filling out the test and for the objective measurement of height and weight, which allowed for privacy, silence, and concentration. In order to gain greater discretion, small groups of subjects were evaluated for a period of four months.

As regards the two gyms, after contacting those in charge, the subjects were recruited by using a leaflet illustrating the research. As far as the scholastic institute was concerned, an agreement was made with the supervisor of the school's Health Committee, who allowed us to recruit those students with the required characteristics. All participants in the study were informed about the aims and the methods to be used, and were asked to give their informed consent. It was necessary for their parents to also give this consent for subjects under eighteen years of age.

Data analysis

An analysis was carried out on the frequency and on the percentages of replies that are considered as the most significant items of the PSED, with reference to the habits and the eating behaviours characteristic of the sample group. The χ^2 statistical test was used to highlight possible gender differences in connection with the above mentioned frequencies.

As regards the analysis of the data, which were mainly of an ordinal or nominal type, the decision was made to use non-parametric statistics. Using the Wilcoxon test (for two dependant sample groups) we calculated the difference between figures for BMI (body mass index)[2] height and weight, as given and measured.

The Mann-Whitney test (for two independent sample groups) was used to verify whether there were statistically significant differences between boys and girls in reply to the items on the PSED described below: 13-14-18-19-34-35.

Results

Eating habits and behaviour of the sample group and subgroups (males and females).

Table 1 shows that 9 males (15.3%) and 15 females (30%), for a total of 24 subjects (22%), indicated that they had had weight problems in the past. Thirty-four (31.2%) subjects indicated that they had undertaken dieting, of which 11 are males (18.6%) and 23 are females (46%). Out of the total number of subjects that claim to have binged (32 subjects for a total of 29.4%), 21 are males (35.6%) and 11 are female (22%). Eleven (10.1%) subjects indicated that they vomit occasionally, of which 8 are males (13.6%) and 3 are females (6%). Only 5 females (10%) reported to occasionally using laxatives in order to lose weight. On account of the small size of the sample group, we did not consider any possible gender differences in the items connected to vomiting and the use of laxatives.

Male-female comparison with reference to reported and measured BMI, weight, and height

A comparison between the body mass reported and that obtained by measurement shows that the entire sample group of patients has a distorted perception of their body image; in fact, in all three groups (males, females and total sample group) the BMI reported is inferior to that obtained as a result of measurement. In particular (Table 2), it is to be noted that,

[2] The body mass index is obtained by the weight (in kg) divided by the height in square metres.

Table 1. Eating habits and behaviour in the sample and its sub-sections

	No. subjects Freq. (%)	Weight problems in the past Freq. (%)	Diet in the past Freq. (%)	Gorging Freq. (%)	Vomiting Freq. (%)	Use of laxitives Freq. (%)
Males	59 (54.1)	9 (15.3)	11 (18.6)	21 (35.6)	8 (13.6)	0 (0)
Females	50 (45.9)	15 (30)	23 (46)	11 (22)	3 (6)	5 (10)
Total	109 (100)	24 (22)	34 (31.2)	32 (29.4)	11 (10.1)	5 (4.6)

Table 2. Wilcoxon Test: Male-female comparison with reference to BMI and the reported (r) and measured (m) weight and height. Outcome of the differences

		Z	p	Outcome
Males	BMIr –BMIm	-4.36	< 0.01	bmi-r < bmi-m
Females	BMIr –BMIm	-2.61	< 0.01	bmi-r < bmi-m
Total	BMIr –BMIm	-4.91	< 0.01	bmi-r < bmi-m
Males	weight-r / weight-m	-0.49	N.S.	weight-r > weight-m
Females	weight-r / weight-m	-2.29	< 0.05	weight-r < weight-m
Total	weight-r / weight-m	-1.75	N.S.	weight-r < weight-m
Males	height-r / height-m	-5.31	< 0.01	height-r > height-m
Females	height-r / height-m	-1.82	Tending to significance	height-r > height-m
Total	height-r / height-m	-5.04	< 0.01	height-r > height-m

as regards the males, the difference is connected with height-r (height reported), which is significantly taller than height-m (height measured), while in the females this is to be attributed to weight-r (weight reported), which is significantly less that weight-m (weight measured).

Item 13 "How do you judge your body (now) from an aesthetic point of view?": the aesthetic judgement expressed by the total sample group with reference to the body aspect (Figure 1) is on the whole satisfactory (59.6%) and good (31.2%). However, in comparison with the females, the males show more positive sensations about their bodies and feel that they are good-looking (39% against 22%) or very good-looking (5.1% against 0%). On the contrary the females report that their body is satisfactory (70% against 50.8% of the males) or ugly (8% against 5.1%).

Item 18 "How do you feel about your body?": 71.2% of males in the sample and 72% of females consider themselves satisfied with their bodies, even if the females give a higher report of dissatisfaction (22% against 8.5% of the males) or loathing of their bodies (8% against 0% of the males) (Figure 2). Moreover, a higher percentage of males report that they are very satisfied (13.5% against 2% of the females) or that they appreciate themselves (6.8% against 0% of the females).

Item 19 "What do you think of your weight?": 13.6% of the males (against 2% of the females) consider that they should put on a little weight, while 27.1% of the males (against 48% of the females), think that they should be a little slimmer. Eight percent of the females replied that they should definitely lose weight. A higher percentage of the males (59.3% against 40% of

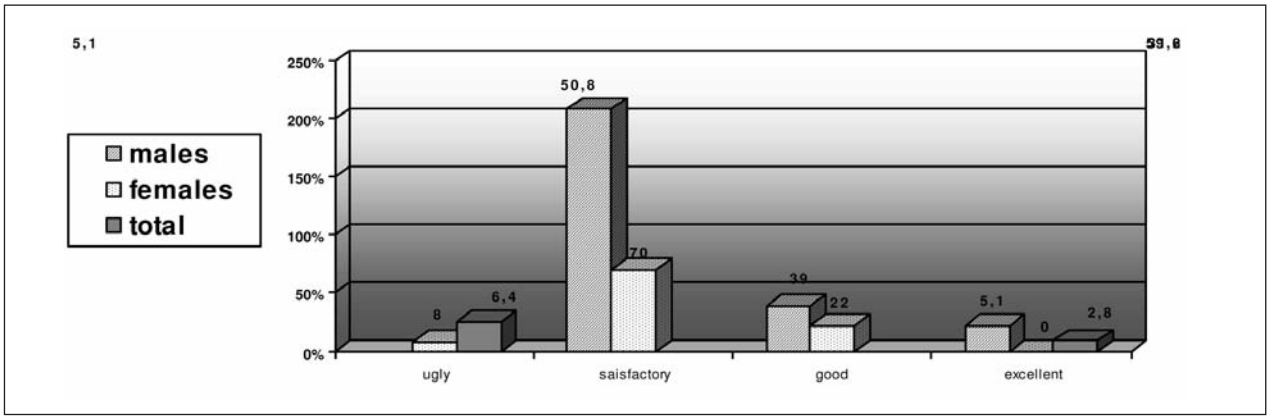

Figure 1. Item 13: What do you think of your body (now) from an aesthetic point of view?

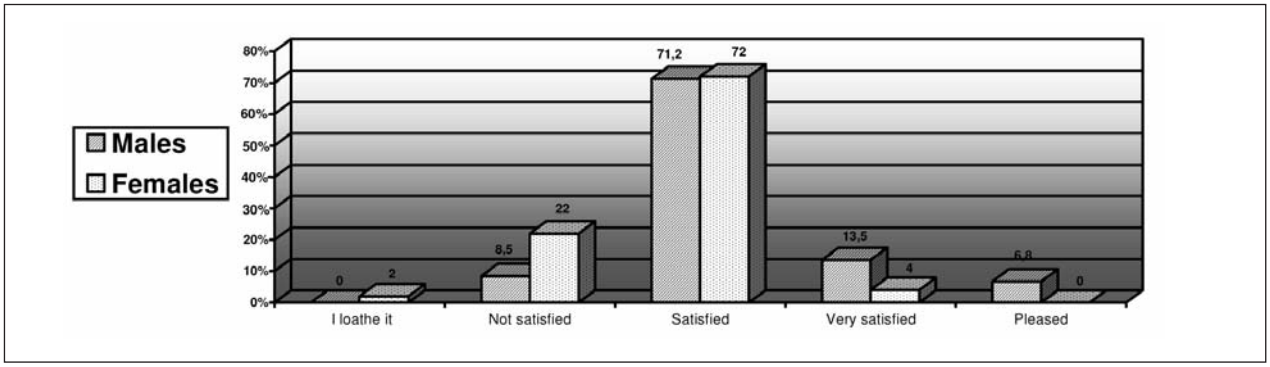

Figure 2. Item 18: What do you feel, thinking about your body?

the females) feel that their weight is all right as it is (Figure 3). In items 13-18-19 a statistically significant difference between males and females with reference to body perception and body concept was found in the Mann-Whitney statistical test. Generally speaking, the males are more satisfied than the females.

Item 15-15a "Have you ever had weight problems in the past? If so, from which age?": 22% of the total sample group replied that they have had weight problems in the past; an analysis of gender difference shows that almost twice as many females (30% against 15.3% of the males) have had this type of problem (Figure 4). The main age group in which problems connected with weight have arisen (Figure 5) is that between 6 and 18 years (91.6%), without evident differences between boys and girls.

Item 16-16a "Have you ever felt that you were too fat?": 36.7% of the subjects replied that they have felt that they were too fat (Figure 6); in the two sub-sample groups there is a lower percentage of males (27.1%) than females (48%). The ages in which the problem was most noticeable range from ages 15 to 17 yrs Figure 7).

Item 17-17a-17b "Have you ever felt that you were too thin? If so, at what age? How do you feel now?": 18.3% of the sample group replied that they have felt too thin (Figure 8); this response, however, was found in a greater percentage of males (20.3%) than females (16%). Most of the sample group consider that they had this type of feeling between 16 and 17 years of age (Figure 9). Although the majority of the sample group members claim that they feel 'right' (males 88.1%; females 82%), it is to be noted, as a confirmation of the

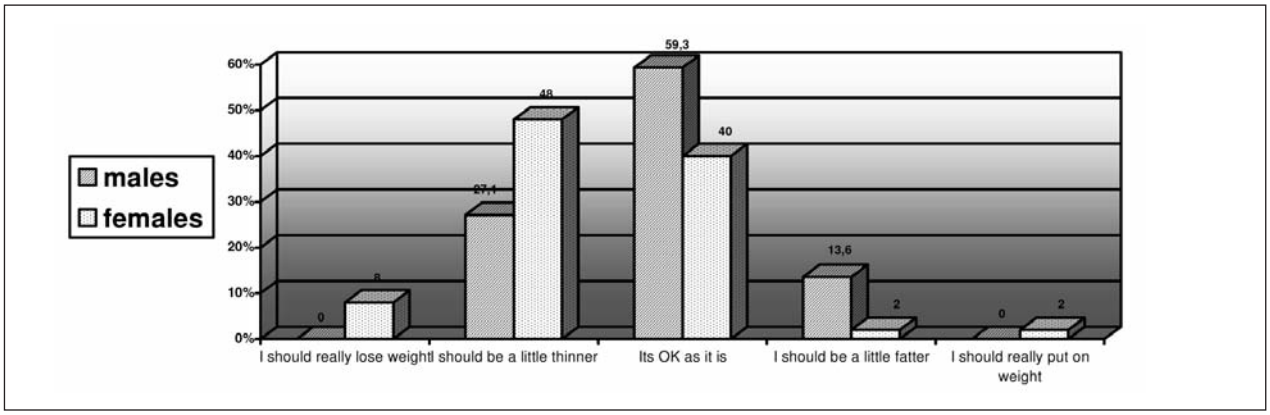

Figure 3. Item 19: What do you think of your weight?

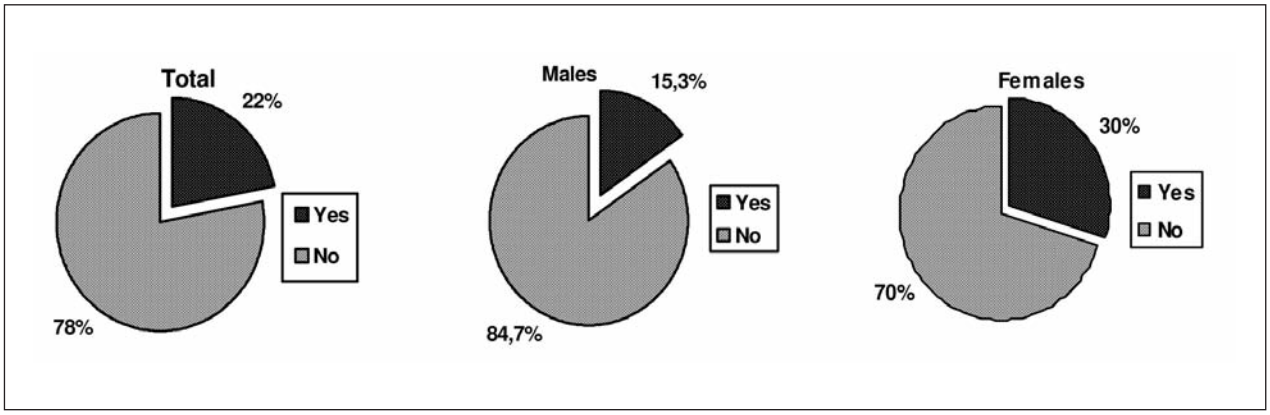

Figure 4. Item 15: Have you ever had weight problems in the past?

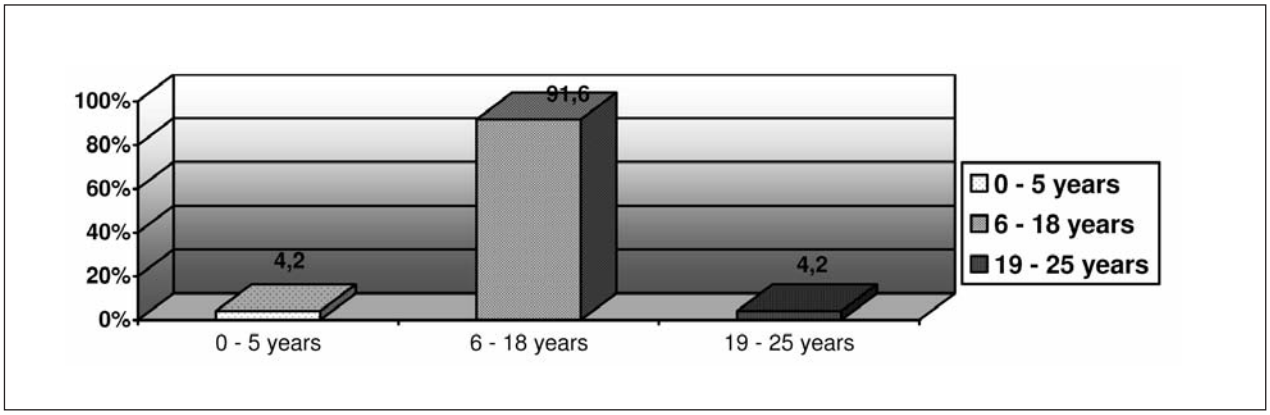

Figure 5. Item 15 a: If yes, since when and from which year?

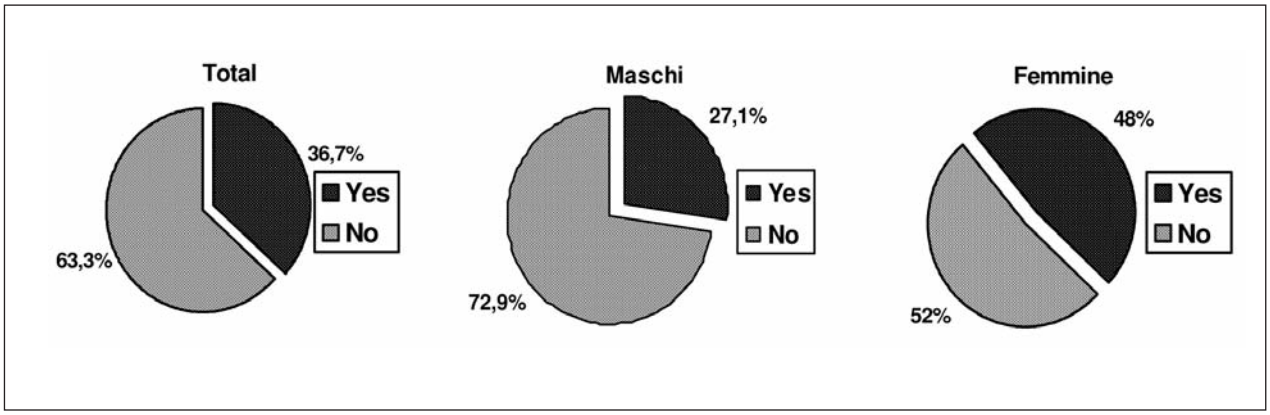

Figure 6. Item 16: Have you ever felt too fat?

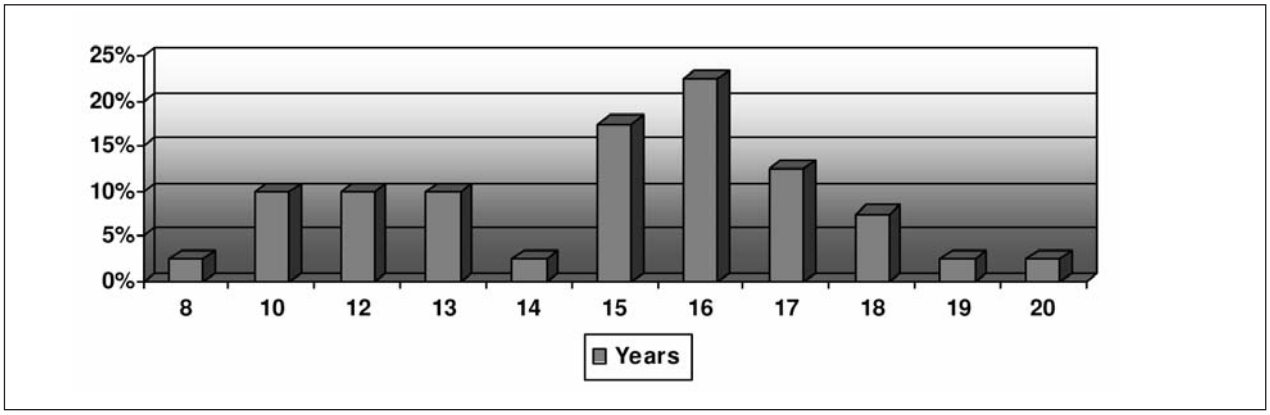

Figure 7. Item 16 a: If so, at what age?

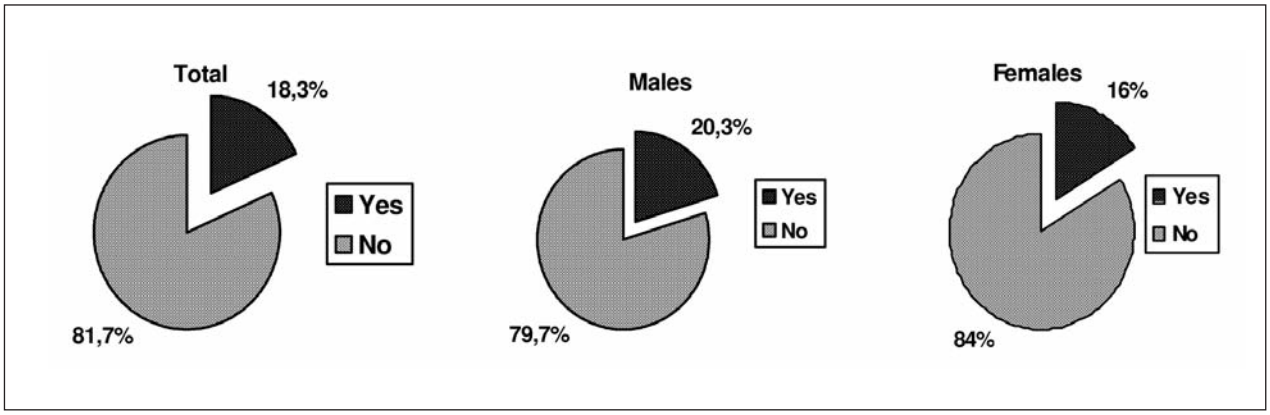

Figure 8. Item 17: Have you ever felt too thin?

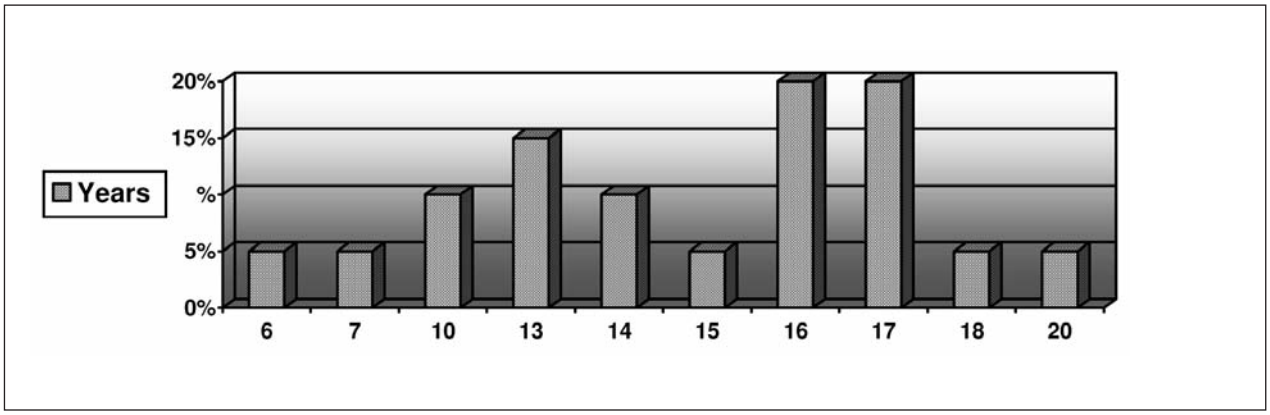

Figure 9. Item 17 a: If yes, at what age?

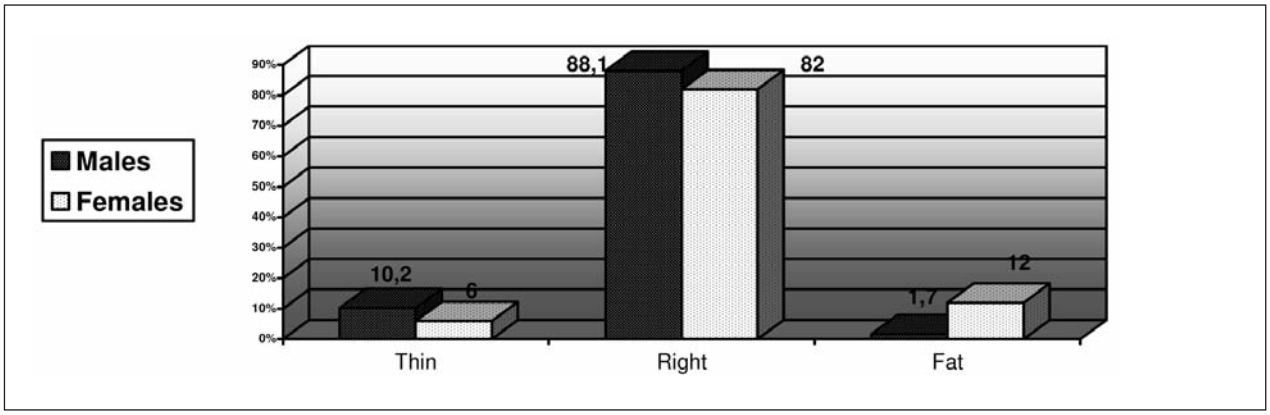

Figure 10. Item 17 b: Right now, at this very moment, how do you feel?

preceding results, that the males perceive themselves as thinner (10.2% against 6%) and less fat (1.7% against 12%) than the females do (Figure 10).

Item 20 "What parts of your body would you like to change because you don't like them, and what parts do you consider as satisfactory?": using the χ^2 test, we were able to identify statistically significant gender differences with reference to the approval levels that the subjects under evaluation assign to various parts of their bodies. The males in our sample paid more attention to those parts of the body connected with images of a muscular athletic physique when indicating those parts with which they are at ease (Figure 11) or that they would like to change (Figure 12). On the other hand, the females in our sample show more interest in the parts of the body that are considered important with reference to a slim, slender physique.

Therefore, one can see (Figure 12) how males, as opposed to females, would prefer to change: shoulders (20% as against 6.1%), abdominal muscles (16.4% against 2%), arms (20% against 10.2%) and back/dorsal muscles (5.5% against 0%). Females, on the other hand, are more dissatisfied and would, as opposed to males, prefer to change: stomach (32.7% against 14.5%), legs (21.4% against 9.1%), thighs (38.8% against 10.9%), buttocks (38.8% against 12.7%) and hips (20.4% against 1.8%).

Item 21-21b "Have you ever gone on a diet? Do you remember the reasons that made you start a diet?": 31.2% of the total sample group reported that they had been

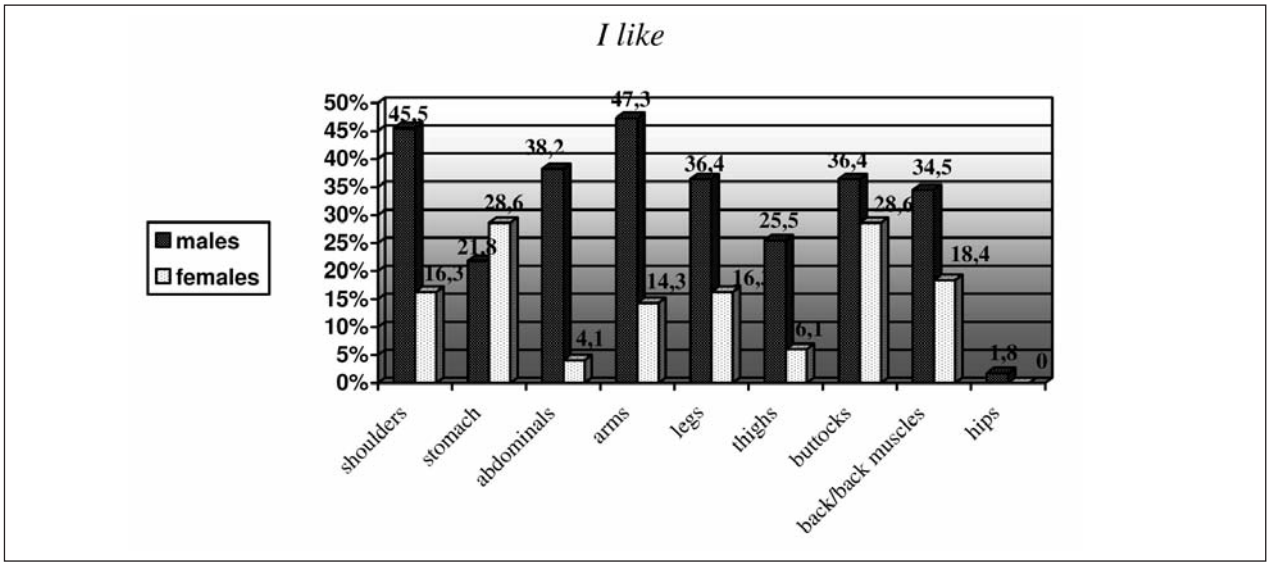

Figure 11. Item 20: What parts of your body would you like to change because you don't like them, and what parts are you content with?

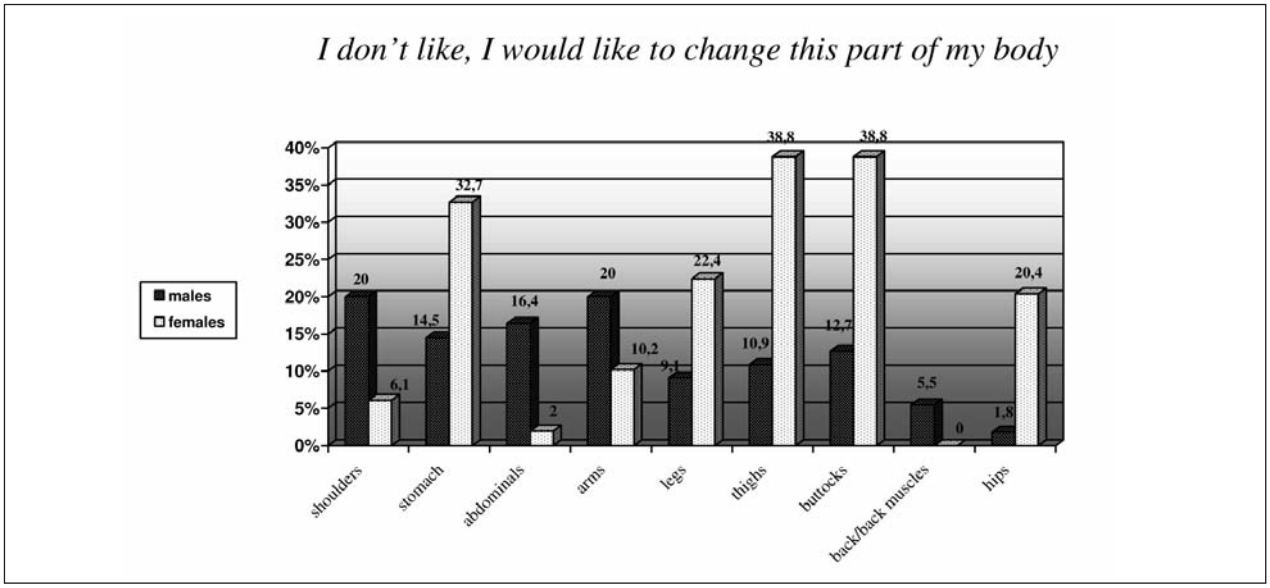

Figure 12. Item 20: What parts of your body would you like to change because you don't like them, and what parts are you content with?

on a diet in the past. A different distribution in the two male and female sub-sample groups is present: 19% of the males, in contrast to almost half of the females (46%) have attempted to diet in the past (Figure 13). Most of the males claim to have dieted in response to a medical prescription (30%), advice from a member of the family (30%), advice from a friend (10%), in order to get thinner (20%), or in order to look more like someone else (10%). On the contrary, the females replied that they have gone on a diet pri-

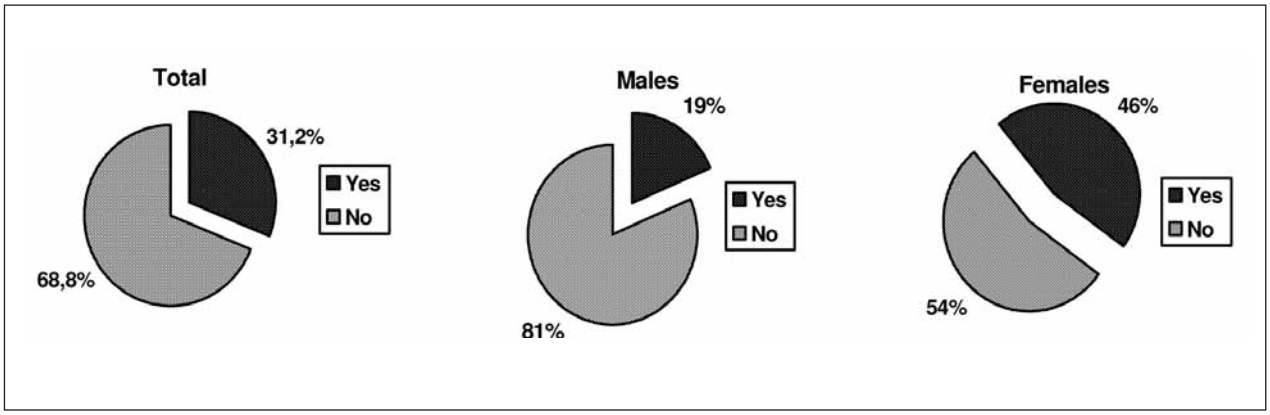

Figure 13. Item 21: Have you ever been on a diet?

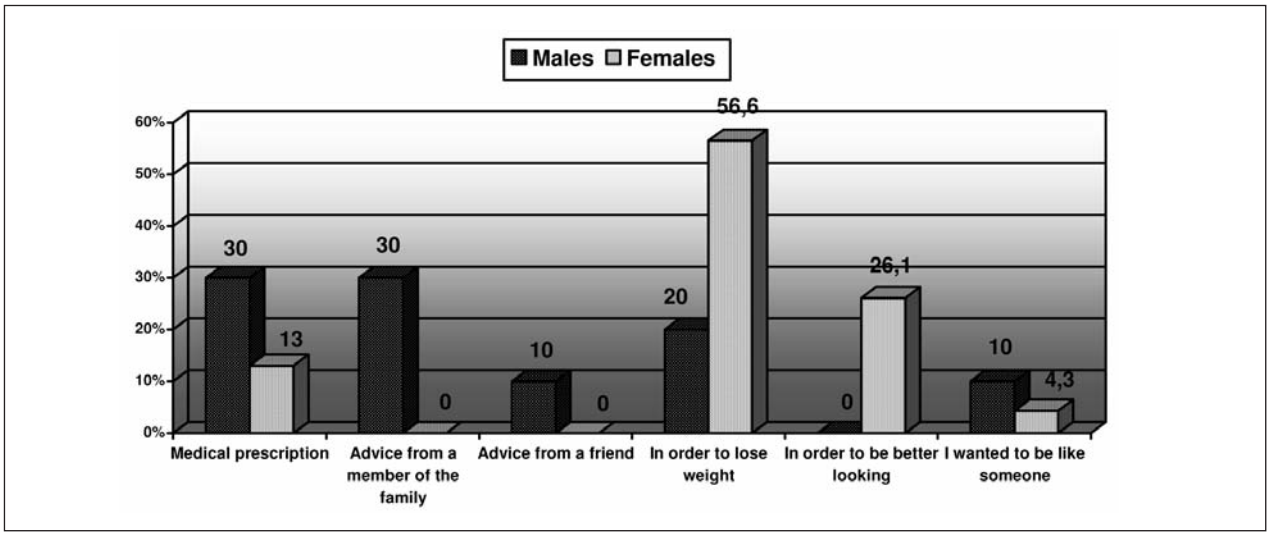

Figure 14. Item 21 b: Do you remember why you started the diet?

marily in order to be thinner (56.6%), to be better-looking (26.1%), due to a medical prescription (13%) and because they wanted to look like someone else (4.3%) (Figure 14). The χ^2 statistical test showed a statistically significant difference between males and females in items 21 e 21b.

Item 25 "Do you ever binge. If so, how often?": Figure 15 shows that a greater percentage of the males (35.6% against 29.4% of the females) report binging behaviour.

Among the subjects that gave an affirmative reply to item 25, once a week seems to be the greatest frequency (65.6%) for binging; 61.9% of the males versus 72.7% of the females binge once a week, 33.3% of the males versus 9.1% of the females binge more than once a week, while 4.8% of the males against 18.2% of the females binge every day (Figure 16).

Item 27 "Where do you normally binge?": considering that the subjects could give more than one reply to item 27, it is to be noted that most of the sample group said

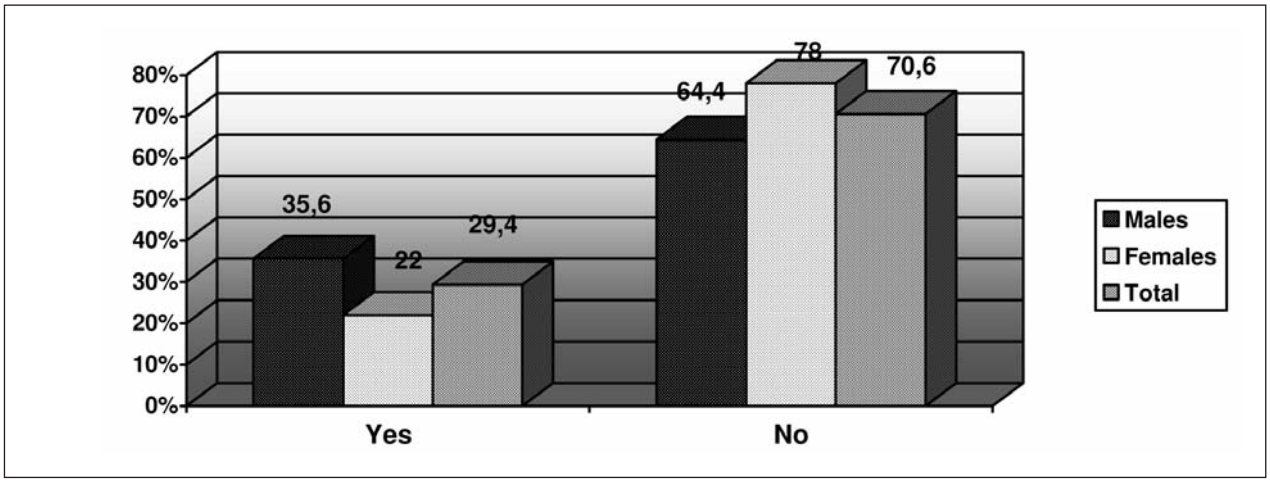

Figure 15. Item 25: Do you ever binge?

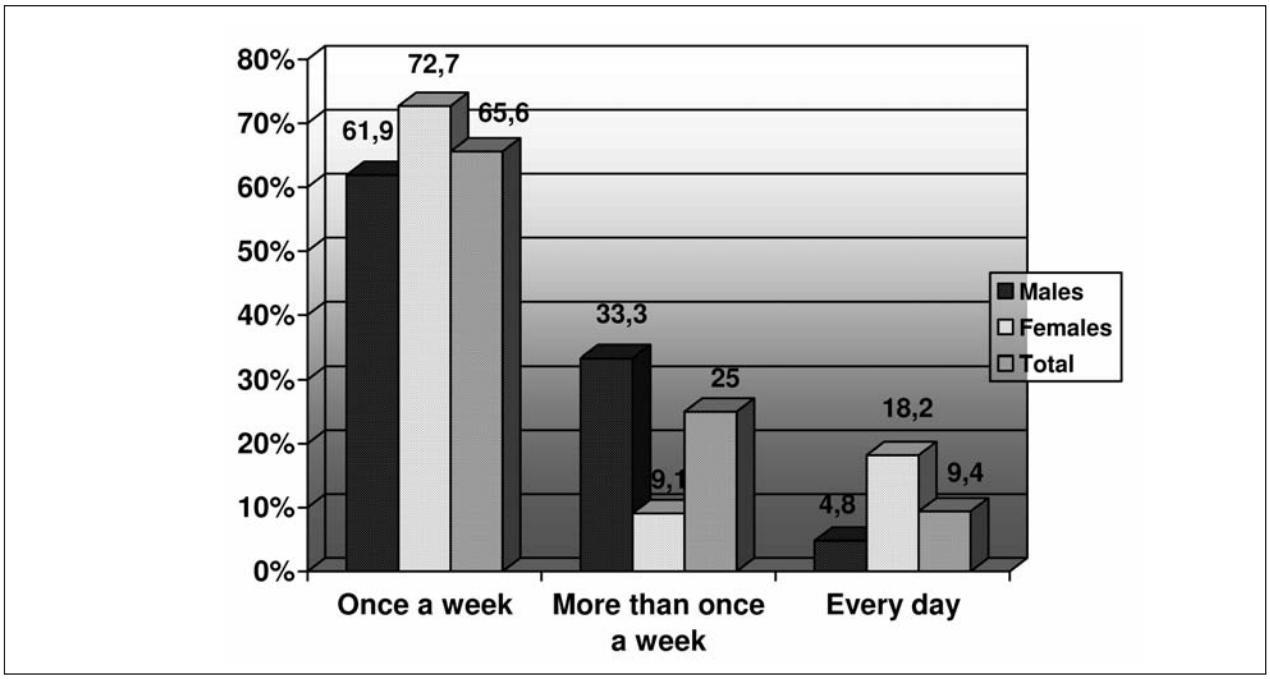

Figure 16. How often do you binge?

that they did so in the kitchen (92.9%) and, in minor percentages, at the café (57.1%) or at school (14.3%).

Item 33 "What types of food or drink do you most frequently eat or drink when binging?": the drinks most frequently consumed by the whole sample during binging are chocolate mik (38.7%), water (32.3%), milk (21.9%), fizzy drinks (25.8%) and, on a lesser scale, wine (12.9%) and spirits (9.4%). Apart from sweets (12.9%), all kinds of confections play a part in the sample's binging, with percentages ranging from 40.6% (chocolate) to 53.1% (cakes/pastries).

With regard to other types of food, high percentages for pasta (51.6%), sliced meats (45.2%) and meat (41.9%) are reported. Important differences were found between males and females (diagram 19): the males drink above all water (42.9%), chocolate milk (33.3%), milk and fizzy drinks (28.6%), wine (19.3%) and spirits (14.3%), while the females drink mainly chocolate milk (50%), fizzy drinks (20%), water (10%) and milk (9.1%).

With reference to confections, males binge much less than females on sweets (4.8% against 30%), chocolate (33.3% against 54.5%), Nutella (38.1% against 54.5%) and ice cream (42.9% against 45.5%). In the last graph, it is to be noted that the males prefer to binge on meat (61.9% against 0% of the girls), pasta (61.9% against 30% of the girls), cheese (30% against 10%) and fish (23.8% against 10%); the girls binge more on sliced meats (60% against 38.1%), yogurt (45.5% against 19%) and fruit (30% against 19%).

Item 34 "How do you generally feel just before binging?": like in Mann Whitney, a statistically significant difference between the subjects' feeling before and after binging is observed.

It seems that the boys feel less emotional disquiet, reporting that before binging they feel less tense, angry, disappointed, alone, or guilty than the girls.

Item 35 "How do you generally feel immediately after binging?": as regards the personal emotions felt after binging, it is to be noted that the boys feel freer and less tense, angry, disgusted, and guilty than the girls.

Discussion and conclusions

The obtained results show that the examined sample of young athletes have a decidedly distorted perception of their bodies. In addition, important differences emerged between males and females, not only as regards dysfunctional eating behaviour (*i.e.* binging), but also in relationship with other phenomena which are considered 'risk factors' for the appearance of eating behaviour disturbances (*i.e.* restrictive or progressive diet plans).

From a comparison among the figures for body mass, height, and weight (reported and measured), carried out using the Wilcoxon statistical test, it is clear that the boys perceive themselves as taller than they really are, but have reasonably correct idea of their weight; the girls on the other hand consider themselves thinner than they really are, but do not misrepresent their height in any significant way. Although most of the subjects claim to consider their own bodies satisfactory or good, it is to be noted that at present the boys would like to change their shoulders, abdominal muscles, arms and back muscles, while the girls are dissatisfied with their stomachs, legs, thighs, buttocks and hips.

Moreover, it is to be seen from item 19 of the PSED that a great percentage of the boys are not satisfied with their weight. This finding corresponds with the results found by Pruneti et al. (7) according to which boys wish to have a slimmer, thinner body, that is at the same time more full-bodied, muscular, and large. A great percentage of the girls would like to be thinner or think that they should definitely lose weight. Moreover, a noteworthy percentage of subjects reported to having had weight problems in the past, in particular between 6 and 18 years of age, with a prevalence of females over males.

The data from items 16 and 17 are interesting as well: almost half the girls reported having felt too fat, in comparison with a smaller but still considerable percentage of males. In their turn, the boys claim to have felt too thin, which is an inexistent impression among the girls.

This finding implies that the girls aspire towards slight, thin, slender figures, while the boys would like to have those particular traits that our society assigns to physical strength, competitiveness, and therefore masculinity.

The data that emerged highlighted the male-female differences in the current perception of their weight: the males consider themselves thinner than do the females, while the females regard themselves as fatter than do the boys. This is in agreement with the findings of Andersen (8), who reported a substantial difference between the pressure brought to bear on teenagers by magazines for girls or boys. Magazines for girls primarily focus on hyper-calorific dieting in

order to lose weight, while male-oriented magazines illustrate various ways of acquiring muscle mass and becoming as fit as possible.

It goes without saying that dieting is considered one of the most important risk factors in the onset of disturbances in eating behaviour. From the results of this research, it is to be observed that almost a third of the examined subjects have practiced dieting. This finding is a real cause for reflection on the enormous risk that young athletes are running. As Keys et al. (12) said in their time, a diet effectively changes the subjects' relationship with food and their conception of their bodies. Analyzing the main reasons that convinced the subjects to go on a diet, it is to be noted how the boys did so above all on medical prescription (in order to achieve better results in sport), or on the advice of friends or members of the family, whearas the girls were influenced above all by their desire to arrive at greatly wished-for slimness that is fully connected with attractiveness.

One of the results of this research that will surely be of great interest is connected with binging or abnormal eating behaviour. More than a third of the boys reported to binging at least once a week or more. In their turn, the girls (even if they binge less than the boys) show a higher frequency percentage in their almost daily abnormal food habits. Although the boys report fewer emotional problems with reference to their binging compared to the girls, the data collected are distinctly odd, particularly considering that the subjects are athletes from whom one would expect more regular eating habits.

As confirmed by our results, one of the boys under evaluation wrote in the final notes to the test: "I eat a lot and I cannot skip a meal without feeling unwell and below par. My metabolism is very fast and so I quickly use up whatever I swallow. I am in the habit of playing a lot of sports and I go to bed late, but this is not the reason why I feel tired or worn out. During the holidays I eat more than usual, but even so I lose a couple of kilos because of my intense physical activity".

From what has been set out above, we can gather that there is a very close relationship between binging, physical exercise, and a clear emotional unease caused by behaviour that is not helpful in achieving a good psycho-physical balance. Even though we cannot say that the subjects evaluated are suffering from uncontrolled eating disorders (which are to be diagnosed under the category *Eating Disturbances* NAS of the DSM IV), we must take the present risks factors into consideration, even and especially in cases where the young atheles might stop exercising and therefore compensating in that way for the enormous quantity of food that they consume.

Moreover, although the obtained results are to be considered partial, they demonstrate the need for all those operating in the field, as well as health workers and coaches, to pay more attention to the problems of the single individual, beginning with their personal history (dieting, relations with family members and peers, etc.). In addition, the results call for health professionals to carry out activities aimed at the three levels of prevention, as well as the promotion of educational and informational activities for young people and their instructors. Such action will allow for development in the areas in which intervention is possible and has been carefully estimated as effective, and will also allow families to save money on health care.

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Accepted: December 3th 2010
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