Body Image and Growth in Italy

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A B S T R A C T

The worrying increase of nutritional disorders and psychological discomfort in young population, mainly from western societies, shows that body image could be a basic variable in a population screening especially during growth when physical changes and biological and emotional development occur. This is one of the first studies in northern Italy investigating differences in body shape concerns among different age-groups and sexes. The sample consisted of 1754 Italian youths aged 11–23 years. Participants were examined during a cross-sectional study. Body image perception was assessed using appropriate Body Silhouette Charts. Body Mass Index was calculated from measured height and weight. The results demonstrated age variability and sexual dimorphism in body image perception. The analysis of body image perception is a valid source of information and should be assessed in studies on youth growth, since it varies with age, sex, population, pathologies and socio-cultural environment.

Key words*: body image perception, growth, body mass index*

Introduction

The last few decades have seen the development of a multilevel approach to the study of growth. Auxology is closely related to sociology and psychology, and the study of body image perception in children has long been associated with anthropometric research[1–4], especially in samples with nutritional disorders such as obesity, bulimia or anorexia nervosa[5–7]. Body image is defined as the perception of one's own and others' body size and appearance (and the emotional response to this perception)[8]. The worrying increase of nutritional disorders and psychological discomfort in young people, especially in Western societies, shows that body image could be a basic variable in population screening, especially during growth when physical changes and biological and emotional development occur[9–12]. Analysis of body image perception is an important tool to detect psychological disorders that might be reflected in body-related behaviours (principally eating and physical activity)[13]. A number of external factors influence body image perception, including age, gender, the influence of mass media, education and genetic influences[8,14].

To analyse an individual's awareness of his/her growing body, body image perception is assessed in different growth periods, characterized by critical biological and psychosocial events. Our investigation moves in two directions: to examine the ability of self-evaluation among Italian youths aged 11 to over 20 years and to identify dissatisfaction with their body, according to age, sex and weight. In fact, body image perception includes cognitive and affective elements which could be independent: a subject may be able to objectively evaluate his own body and be dissatisfied with it, whereas the degree of over- and underestimation may not be connected with the degree of satisfaction[8]. This type of research is still limited: in Italy, body image perception analyses are mainly addressed to special populations affected by nutritional disorders or pathologies[15,16]. However, body image perception inaccuracies are not only a criterion to identify nutritional disorders, since they are not confined to particular populations[4,17]. Indeed, body image represents an individual's subjective experience with his/her body and the manner in which he/she organizes the experience[18].

This is one of the first studies to examine the association between perceived body image and various demographic characteristics and Body Mass Index during several growth phases in a large representative sample from Emilia-Romagna region, northern Italy.

Subjects and Methods

This research is a part of a broader project dealing with growth in a large sample of youths from Emilia-Romagna, northern Italy. The project is divided into several parts: anthropometry, body image perception assessment, nutritional survey and general information about the subjects. The sample consisted of 1754 participants aged 11–23 years (826 males and 928 females). Participants were directly interviewed by the Authors. Their participation in the survey was voluntary; anonymity and confidentiality were assured. Parental consent was given for all subjects aged 11–18. Almost all the subjects took part in the study and only a small number didn't want to participate (1,7%). The research was reviewed and approved by an institutional review board.

The subjects were examined in a cross-sectional study analyzing body image perception in different growth periods characterized by critical biological and psychosocial events: 11–14 years (early adolescence, corresponding to middle school classes), 16–18 years (late adolescence, peer influence and access to greater freedom of activity and independence, corresponding to the third year of high school) and 19–23 years (transition to adulthood and maturity, corresponding to university). The sample composition is reported in Table 1. All participants attended schools in the Emilia-Romagna region (northern Italy). Of the 1754 youths examined, 1409 (the 11 to 18--year-olds) studied in Bologna and the others (the 19 to 23-year-olds) in Ferrara.

Many anthropometric characters were measured during the general auxological study, but for our purposes we considered only height and weight for Body Mass Index calculations. A portable anthropometer (P. Hermann, Zurich) was used for height (reading accuracy ±0.1 cm) and all participants were weighed with a digital balance (Sohenle, reading accuracy ±0.1 kg) while wearing one layer of undergarments, without shoes.

Body mass index was calculated from measured weight/height (BMI: kg/m^2) and participants were categorized as underweight, normalweight, overweight and obese (Actual BMI category) according to their BMI value, using the cut-offs for age and gender for northern Italy defined by Cacciari et al.[19] We used specific cut-offs for northern Italy because other international cross-sectional growth charts can introduce biases in the assessment of children, as there are ethnic differences in age at pubertal growth spurt, final adult height and secular trend. Moreover, the Italian references allowed us to single out underweight subjects, for which there are no international references: for this purpose, we chose the 3rd centiles of BMI for northern Italy as the threshold[19].

Body image perception was assessed using Body Silhouette Charts appropriate to age, consisting in a sequence of body silhouettes progressing from very thin to obese[20,17]. The Collins set of silhouettes (figure 1 to figure 7) was used for subjects aged 11–14 (middle school), and the McElhone et al. set (figure 1 to figure 9) was used for those over 16 years (high school and university samples). Participants were asked to indicate which figure represented themselves (Estimated Self figure) and what would be their ideal figure (Ideal Self figure). Subjects chose a figure labelled with a number. In figure 1 we reported mean of selections.

According to the literature[20,21], the correspondence between the figures and the BMI categories is the following. For the first set: 1–2 underweight; 3–4 normal weight; 5–6 overweight; 7 obese. For the second set: 1–3 underweight; 4–5 normalweight; 6–7 overweight; 8–9 obese[17]. Therefore, we could assign a BMI category to each Estimated Self figure chosen by subjects (Estimated Self BMI category). The degree of dissatisfaction (Estimated Self figure minus Ideal Self figure) and a discrepancy score (Estimated Self BMI category minus Actual BMI category) were calculated. The degree of dissatisfaction identifies four groups: Heavier (when a subject wants to be heavier than he/she perceives himself/herself to be); Content (when a subject is content with his/her perceived body image, i.e. Ideal Self figure corresponds to Estimated Self figure); Lighter (when a subject wants to be a bit lighter than at present, i.e. the Ideal Self is one figure less than the Estimated Self); Considerably Lighter (when the Ideal Self is two or more figures less than the Estimated Self)[17]. The discrepancy score identifies three groups: Overestimation, Correct Identification and Underestimation.

Children of immigrants were excluded from the analysis so has to have homogeneous data and to minimize the potential variability introduced by differing standards of beauty in various cultural groups. In fact, ethnic and cultural diversities in body image have been documented[22–25].

Data were analyzed by descriptive statistics and the results are given as percentage of subjects. Pearson Chi square was used to compare subject categories.

Correlations between body image variables were assessed with Spearman's r. The p values were set at 0.05. The statistical analyses were performed with »Statistica« (version 5.5; StatSoft Italia srl, Vigonza, Padua, Italy).

Fig. 1. Mean selections for Estimated (continuous line) and Ideal (dotted line) body image by age and sex.

Results

All participants were categorized on the basis of their BMI value according to the cut-offs for the Italian population[19] (Table 1). The percentages of normalweight individuals were always more than 80%, except for males at maturity (73.3%). For both sexes, the highest prevalence of underweight subjects was at middle school and of obese subjects at high school.

The great dissatisfaction of the females is immediately apparent from the distance between the two bars in Figure 1; the dissatisfaction increases with age, mainly because the Ideal figure shifts to leaner silhouettes. On the other hand, Estimated Self and Ideal Self tend to coincide in males at all ages. Thus, the girls' body image worsens with time, while the boys' body image does not.

At middle school, both sexes chose normalweight figures: Chi square between the sexes was not significant for Estimated Self, whereas for Ideal Self the p-value was <1%: girls probably already have leaner aesthetic stereotypes than their male peers.

At high school, the Estimated Self figure was normalweight for females and underweight for males (Chi with p<1%). Both sexes chose the underweight silhouette as ideal, but the Chi square was still significant (p<1%).

The situation was the same for the university sample, although the range shifted to lower values: males chose underweight figures for both Estimated Self and Ideal Self, females chose normalweight figures for Estimated Self and underweight figures for Ideal Self. There was no significant difference between the sexes for Ideal Self Figure: the aesthetic ideals were common to both sexes.

To assess the relationship between the selection of perceived body image (Estimated Self BMI category) and the current figure (Actual BMI category), we calculated the degree of under/overestimation (Table 2). At all ages, 50% of the girls at least classified themselves correctly, showing good awareness of their body. The percentage of boys correctly classifying themselves was high at middle school and then decreased to 15.3% at maturity. Males classified themselves worse than females (total sample: 44.2% versus 49.7%. Chi square with p<1%), as they were more likely to underestimate their body size (30.5% versus 24.9%). Chi square between the sexes was significant for self-evaluation at all ages.

The correlation values confirm the gender trend: there is a strong negative correlation of self-evaluation with age in males (r=–.63, p<1%) but not in females (r= –.23).

In a further analysis, we controlled self-evaluation in relation to the subjects' Actual BMI category (underweight, normalweight, overweight or obese). Subjects in the overweight category showed the most objective self-evaluation in both sexes at all ages except at high school:

TABLE 1

SAMPLE COMPOSITION BY AGE, SEX AND ACTUAL BODY MASS INDEX CATEGORY

Age	n	% Males				n	% Females				Total
		Under-weight	Normal-weight	Over-weight	Obese		Under-weight	Normal-weight	Over-weight	Obese	
11–14	397	2.6	80.1	15.7	1.6	349	2.9	86.3	8.8	2	746
16–18	264	1.5	82.9	11.7	3.8	399	0.5	88.9	8.5	2	663
19–23	165	0.7	73.3	22.7	3.3	180	0.6	89.2	9.6	0.6	345
Total	826					928					1754

TABLE 2

SELF EVALUATION BY AGE, SEX AND ACTUAL BODY MASS INDEX CATEGORY

Age (years)		Males					Females				
		Mean	Under-weight	Normal	Over-weight	Obese	Mean	Under-weight	Normal	Over-weight	Obese
	Underestimastion		–	4.6	1.7	50.0		–	13.8	6.7	71.4
11–14	Correct	52.5	20.0	46.9	93.3	50.0	52.8	60.0	49.1	73.3	28.6
	Overestimation		80.0	49.1	5.0	–		40.0	36.9	20.0	–
	Underestimastion		–	57.8	66.7	87.5		–	33.3	14.7	50.0
16–18	Correct	45.9	100	37.9	33.3	12.5	68.5	100	44.6	79.4	50.0
	Overestimation		0.0	4.3	0.0	–		0.0	22.2	5.9	–
	Underestimastion		–	90.5	82.4	100		–	41.7	16.7	np
19–23	Correct	15.3	np	9.5	17.6	0.0	59.2	np	51.7	66.7	np
	Overestimation		np	0	0.0	–		np	6.7	16.7	–

TABLE 3
TREND OF DISSATISFACTION BY AGE AND GENDER

Groups	Middle school		High school		University		on Total	
	% M	% F	% M	% F	% M	% F	% M	% F
Heavier	13.8	9.6	25.9	5.0	31.9	7.0	20.8	7.2
Content	40.4	33.7	45.0	17.9	31.9	13.4	40.2	23.3
Lighter	31.3	31.9	11.4	33.5	24.6	43.3	24.1	34.7
Considerably lighter	14.6	24.7	17.7	43.5	11.6	36.3	14.9	39.9

TABLE 4
TREND OF DISSATISFACTION BY ACTUAL BODY MASS INDEX CATEGORY AND SEX

	% Males				% Females			
Middle School	Under-weight	Normal-weight	Over-weight	Obese	Under-weight	Normal-weight	Over-weight	Obese
Heavier	75	25.8	0.9	0.0	29.8	12.7	0.7	0.0
Content	18.8	56.3	32.1	0.0	53.2	44	16.8	0.0
Lighter	6.3	15.9	44.5	25	17	31.3	40.1	0
Considerably lighter	0	1.9	22.5	75	0	12	42.3	100
High School	Under-weight	Normal-weight	Over-weight	Obese	Under-weight	Normal-weight	Over-weight	Obese
Heavier	46.4	5.9	0	0.0	15	1.3	0	0.0
Content	50.9	48.8	4.3	0.0	42.5	12.9	0	0.0
Lighter	2.7	21.4	17.4	0	35.4	43.5	18.6	10
Considerably lighter	0	23.8	78.3	0	7.1	42.2	81.4	90
University	Under-weight	Normal-weight	Over-weight	Obese	Under-weight	Normal-weight	Over-weight	Obese
Heavier	50	8.9	0	0.0	19.6	1.3	0	0.0
Content	32.1	31.1	14.3	0.0	25.5	10.7	0	0.0
Lighter	16.7	42.2	14.3	0	52.9	48	19.2	0
Considerably lighter	1.2	17.8	71.4	100	1.9	40	80.8	100

in the high school age class, the underweight category was most objective in self-evaluation (Table 2). Normalweight subjects of both sexes tended to overestimate themselves when they were younger and to underestimate their body as they were growing up. There was no significant correlation between BMI and self-evaluation results. Furthermore, some underweight girls in middle school who overestimated themselves actually indicated their Estimated Self figure as overweight. Overweight males who underestimated themselves by indicating an underweight Estimated Self figure were at a low percentage in high school but the value increased in university.

Females showed the highest percentage of subjects who wanted to be considerably thinner than their Estimated Self figure (Table 3). Males were significantly more content with their figure than females. At all ages, more males than females preferred to be heavier, whereas more females preferred to be considerably thinner (Table 3).

We also analysed this trend on the basis of Actual BMI category. Without considering age, Table 4 shows worrying percentages in the underweight categories, especially the female underweight subjects: they were content (about 41%) or wanted to be even leaner (9% of males and 39.8% females). Males showed a high percentage of satisfied overweight subjects. The highest percentages of satisfied subjects were those of normalweight boys and underweight girls.

By considering the different age-groups (Table 4), underweight and normalweight females in high school and university wanted to be leaner, underlining the presence of strong aesthetic stereotypes of thinness after puberty. Males were more well-balanced, even though high percentages of normalweight subjects in high school and university wanted to be thinner. There was a decreasing trend with age in the percentage of satisfied girls among underweight and normalweight subjects: the subjects who wanted to be lighter increased, passing from 17% to

54.8% of the underweight girls and reaching 90% of the normalweight girls. The percentage of satisfied normalweight males also decreased with age. However, in middle school, a good percentage of males (32.1%) were satisfied with their body image. The highest percentages of satisfied subjects were those of normalweight males (56.3%) and underweight females (53.2%) (in middle school). A significant (p=.002) correlation between BMI and dissatisfaction was observed in both sexes, with slightly higher values in girls (r=0.6) than in boys (r=0.5).

Discussion and Conclusion

In recent years, a multilevel approach to the study of growth has provided a more complete picture of the phenomenon. Indeed, factors influencing the growth process have changed, especially the psychological and social ones[26–28].

Body image perception analysis helps us to interpret aesthetic constructs for clinical and epidemiological applications. Knowing how people imagine their body and its dimensions and their degree of satisfaction with it can be helpful in the prevention and care of some nutritional disorders, such as obesity, bulimia and anorexia nervosa. Born with this aim, body image perception can be considered an important variable in population screening, especially during growth when nutritional disorders frequently occur. In our research, we have attempted to analyse a wide range of ages, covering three critical growing periods: early adolescence, late adolescence and maturity.

Our results indicate that the analysis of body image perception is a valid source of information and that it should be assessed in studies on youth growth, as it varies with age, sex and BMI values. This work is one of the first studies of a large homogenous Italian sample spanning early adolescence to adulthood, although several other studies have been published at the international level[4,9,17].

There are some important limitations to the present study. First, the design was cross-sectional; thus, no inferences can be made about factors influencing body image perception during the growth process. Second, for obvious reasons, the assessment was conducted with different silhouettes for different ages.

Body image disorders have recently been found in normalweight subjects without any nutritional problems, and the phenomenon was stronger in females, »as a rule« or a cultural imperative[29]. Dissatisfaction has become so endemic in the female population that it has been described as »normative discontent«[30]. We also found differences between the sexes: females were more objective in self-evaluation but more dissatisfied with their figure; males classified themselves less accurately than females, mainly underestimating their figure, as found in previous studies on Caucasian samples[17,31,32]. More females classified themselves correctly than their male peers, except at 13 and 14 years of age. Perhaps this age is critical for girls, as a consequence of the gap between the speeds at which somatic (pubertal development) and psychological transformations occur. Moreover, because of probable future motherhood, girls feel their bodies are not completely their own, but somehow a »social body«[33]. Women begin to internalise this requirement for attractiveness in childhood and their body image worsens, while that of boys improves with time.

With development, males want to be heavier, because weight increase is associated with increase in muscular mass[34]. In fact, there are other behavioural gender differences linked to the body. Boys are more concerned with stature and muscular and sexual development (low height and weight are most worrying to them), while girls consider excessive height and weight values most inappropriate. In fact, our research showed that the most satisfied category was that of overweight males. On the other hand, although underweight females are most at risk of nutritional disorders, they were content or wanted to be even thinner (most of them indicated an overweight silhouette as Estimated Self).

We also found that self-esteem was related to body weight: the higher the BMI, the greater the dissatisfaction. Body image perception changes with age and is not fixed during growth. As age increases, more confusion about self-evaluation occurs: the body image changes to accommodate physical changes[35].

In conclusion, our cross-sectional study showed that body image perception varied with age, sex and Body Mass Index. Further longitudinal studies could help to identify the factors that determine body image perception and precisely when they occur during the growth process. In fact, despite the demonstrable importance of body image perception, little is known about the factors that influence changes in body image over time.

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PREDODŽBA O TIJELU I RAST U ITALIJI

S A Ž E T A K

Zabrinjavajuće povećanje prehrambenih poremećaja i psihološke nelagode kod populacije mladih, pretežno iz zapadnih zemalja, pokazuje da predodžba o vlastitom tijelu može biti temeljna varijabla u »analitičkom pregledu« (screening-u) populacije, posebice tijekom rasta, kada dolazi do fizičkih promjena te biološkog i emocionalnog razvoja. Ovo je jedna od prvih studija u sjevernoj Italiji koja istražuje razlike u brizi o obliku tijela između različitih dobnih skupina i spolova. Uzorak je činilo 1754 mladih Talijana u dobi od 11–23 godine. Sudionici su pregledani tijekom presječne studije. Percepcija predodžbe o tijelu je procijenjena upotrebom odgovarajućih kartona sa siluetom tijela. Indeks tjelesne mase (BMI) je izračunat iz izmjerene visine i težine. Rezultati su pokazali varijabilnost u dobi i seksualni dimorfizam u percepciji predodžbe tijela. Analiza percepcije predodžbe tijela je vrijedan izvor informacija i trebao bi se procjenjivati u studijama humane biologije, budući da varira s obzirom na dob, spol, populaciju, patologije i socio-kulturno okruženje.