Self-perception of Physical Appearance in Adolescents: Gender, Age and Ethnic Aspects

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ABSTRACT

The study used cross-sectional data of 462 girls and 372 boys of Russian ethnicity and 90 Kalmyk girls 12–17-year-olds. In both groups children were examined by the same researchers according to the same research protocol. All of the observations have been performed in agreement with bioethical procedures; protocols of consent were filled either by the subject (elder children) or by his/her parent(s). Standing height, weight, body circumferences and skinfolds thickness were taken on each individual according to the standard technique. Body mass index (BMI) was calculated. In Arkhangelsk city 114 boys and 172 girls among the total number of studied subjects filled in the questionnaires, and in Elista – 34 girls among 90. Data sets were divided according to sex, age, somatotypes and ethnicity. The results of the present study showed significant correlations between somatotypes of the subjects, their BMI and self-estimation of their physical appearance. In self-perception of one's body, weight was the most important characteristics in girls, while in boys it was stature. No differences were found in most of self-evaluation scores between Russian girls of Arkhangelsk city and Kalmyk girls of Elista, apart from the fact that the latter had lower scores in the estimation of their body shape, possibly because they were fatter. The strategies chosen by the adolescents for modifications of their bodies in their quest for »ideal« figures were in favor of dieting versus physical activity, which puts the question of popularization of physical culture and sports on a nation-wide scale.

Key words: anthropology, somatic status, self-esteem indicators, school-age children, Russians, Kalmyks

Introduction

The problem of body image, its self-perception and dissatisfaction with one's own appearance is widely discussed in anthropological and medical literature[1–3]. This can be explained by a widespread phenomenon of distorted body image in different gender and age groups, in populations of different ethnicity. Inadequate perception of one's body often leads to attempts to change it, which might be harmful for one's health. This is particularly true about adolescents who are extremely sensitive to the opinion of their peers[4].

In many post-socialist countries, including Russia, there was a trend at the turn of the centuries towards ectomorphy and leptosomization (from leptos – Greek – narrow), more expressed in girls[5–7]. At the same time in many industrialized countries »obesity epidemics« became a hallmark of the 21st century[8–10]. In modern societies »ideal« body size is the one that is typical for thin fashion models[11,12]. These »ideal« images are translated by mass-media and influence self-assessments of their bodies in young people and adults[13,14]. Youngsters are particularly concerned about their physical outlook and try to comply with some »ideal« images. Tall and slim females have more chances for better jobs and marriages.

Attempts to follow the stereotypes can lead to eating disorders[15,16], some bad habits, e.g., smoking[17], depressive symptoms[18,19] and other health abnormalities. Dissatisfaction with one's body is often expressed by young women with normal weight and body proportions[13,14,20]. These tendencies are even more pronounced in teenagers who are especially influenced by mass-media propaganda. That is why it is particularly important to analyze the perception of physical appearance by schoolchildren.

The purpose of the present study is to assess the influence of children's somatic status on the evaluation of their physical appearance and to analyze some possible associations between self-perception and gender, age, ethnicity of the studied children.

Materials and Methods

462 girls and 372 boys of Russian ethnicity (both parents Russian), aged 12–17 years, were examined in Arkhangelsk in 2009 as part of a larger project dealing with physical development of children in the Russian North[6,21]. In 2008, 90 Kalmyk girls (both parents Kalmyks), 16–17-year-olds, were investigated in the city of Elista, capital of Kalmyk Republic (Russian Federation).

In both groups children were examined by the same researchers according to the same research protocol. Children were measured during or immediately after school-hours. All anthropometric measurements were taken according to standard techniques. Subjects were measured bare-feet, in their underwear. All of the observations have been performed in agreement with bioethical procedures; protocols of consent were filled either by the subject (elder children) or by his/her parent(s).

A large number of anthropometric and anthroposcopic characteristics (about 50) were taken on each individual according to the standard technique[22,23]. However in the present paper only the following anthropometric traits are being analyzed: standing height was measured using a Model 101 – Anthropometer (GPM manufacturers, Switzerland, http://www.seritex.com/gpm); weight was measured on a digital scale. Circumferences (chest, waist, hips, arm, forearm, thigh, lower leg) were measured using a measuring tape; skinfold thickness (subscapular, over triceps, over biceps, abdominal, suprailiac) was measured with Harpenden skinfold caliper.

Body mass index (BMI) was calculated from the measurements: BMI= W/L^2, where W – weight in kilos, L – height in meters.

Based on BMI values, weight status was classified as underweight, normal weight, overweight or obese according to the International Obesity Task Force age-and sex-specific BMI cutoffs. These cutoffs for underweight, overweight and obesity correspond to adult BMI values of 17, 25 and 30, respectively[24,25].

Anthroposcopically children's somatotypes were defined according to a classification by Russian investigators V.G.Shtefko and A.D.Ostrovsky[26]. This classification was applied both for adults and children and included four »basic« types: *asthenoid*, *thoracalis* (from *thorax* – Lat. – chest), *muscularis* and *digestivus*. Those types were similar to E. Kretschmer's typological classification[27]. Thus, astenoid and thoracalis types were described as leptomorphs with tall stature, flat chest, narrow shoulders, long and thin legs, which corresponded with Kretschmer's »asthenic«. Shtefko's astenoid type was also characterized with extremely low body fat.

Typus muscularis was characterized with well developed muscles, strong body structure, big or average height, and corresponded with Kretschmer's athletic type. *Typus digestivus* was similar to Kretschmer's rotund pyknic type and was characterized as stocky and fatty with average or below average height.

The questionnaire used in the study was kindly given to the authors by Professor Janina Tutkuviene[28] and slightly modified in the Russian version. In Arkhangelsk city 114 boys and 172 girls among the total number of studied subjects filled in the questionnaires, and in Elista – 34 girls among 90.

The following questions were asked in the questionnaire:

- evaluation of one's physical appearance (average, worse or better than average);
- evaluation of one's stature (short stature, normal, tall);
- evaluation of one's weight (underweight, normal, overweight);
- evaluation of one's body shape / figure (5 scores: 1 – »Very bad«; 2 – »Bad«; 3 – »Satisfactory«; 4 – »Good«; 5 – »Excellent«).

There were also questions about wish and real attempts to change one's body shape (dieting, physical activity), the frequency of eating flour and sweet food, the frequency of having snacks between main meals.

The students were asked to select one of the figures in the Stunkard's figure rating scale (Figure 1)[29] from 9 male or female body figures of increasing size (labeled 1–9), which best resembled their own body size and shape, and to select best (ideal/most attractive for a student) male and female figures.
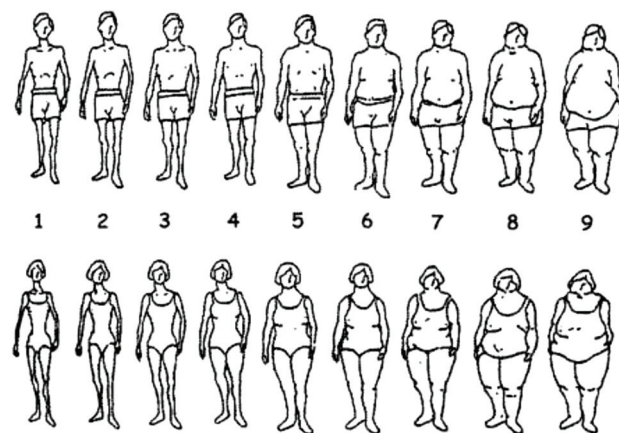

Fig. 1. Stunkard's figure rating scale[29].

According to Bulik et al.[30] the rating scale was divided into 4 categories corresponding with the BMI values: figures 1–2 – underweight; 3–4 – normal weight; 5 – overweight; 6–9 – obesity (Table 1).

Data sets were divided according to sex (boys, girls); age (1st group – G1, B1 – girls and boys of younger age group, students of school grades from 6th to 9th, mean age – 14.2±1.22 years; 2nd group – G2, B2 – girls and boys – students of school grades 10 and 11, mean age – 16.5±0.69 years); somatotypes[27] (*astenoid, thoracalis, muscularis, digestivus*/digestive); and ethnicity (Russians, Kalmyks).

TABLE 1

CORRESPONDENCE BETWEEN STUNKARD'S FIGURES AND BMI VALUES[30]

Figure №	1	2	3	4	5	6	7	8	9
Women's BMI	18.3	19.3	20.9	23.1	26.2	29.9	31.5	38.6	45.4
Men's BMI	19.8	21.1	22.2	23.6	25.8	28.1	31.5	35.2	41.5

Statistical analysis was performed with the Statistica (v. 8.0) software (Statsoft Inc., Tulsa, USA). Spearman Rank Order Correlation coefficient (r_S) were used to study correlations between stature, weight and BMI, on the one hand, and evaluation of one's own figure based on Stunkard's figure rating scale, on the other hand; or between individual somatotype and satisfaction with one's own figure (scores from 1 to 5), choice of the best (»ideal«) male or female figure based on Stunkard's figure rating scale, and satisfaction with one's own stature and weight (»want to weigh less«, »happy with what I have«, »want to weigh more«, etc), on the other hand. To check for statistical significance of Spearman Rank Order Correlation coefficients Student's T-test was used. Statistical significance of proportions of different traits ranks in the subsamples was evaluated with χ^2 test.

To compare the means of morphological parameters in groups of children irrespective of their age, standardization procedure (Z-scores) was used. All data for the two series were combined, after which standardization within each sex and age group was performed. Individual standardized values of the trait were calculated according to the formula:

$$Z_i = \frac{1}{S_x}\left(X_i - X_m\right),$$

where Z_i – standardized individual values of the trait, S_x – standard deviation for the combined group, X_i – absolute individual values of the trait, X_m – mean for each sex and age combined group. For standardized values (Z-scores) mean (Z_m) equals 0 and standard deviation (S_z) equals 1.

One-way ANOVA was further applied to the received Z-scores to check about the homogeneity of the sample. When the heterogeneity was stated, Fisher LSD test or Mann-Whitney U Test was used to check for statistical significance between the two samples. For the traits with non-normal unimodal distribution (weight, chest circumference, BMI, skinfold thickness) non-parametric Mann-Whitney U Test was used.

Results

Satisfaction with their own stature

Only 3.5% among all studied boys and 6.6% of girls considered their stature to be too tall. Almost half of the girls and boys of the younger age (G1 – 44.2%, B1 – 44.6%) would like to be taller. In older age groups the number of boys who wished to be taller was a little bit higher (50.0%), but among girls this figure dropped down to 35.5%. There is a negative correlation at all ages, both for boys and for girls between their actual stature and wish to be taller (r_S=–0.301 и r_S=–0.408, p<0.05).

Influence of adolescents' somatotypes on the satisfaction with their physical appearance

Representatives of different somatotypes had highly significant differences in BMI, average skinfold thickness (ASf, Table 2) both in girls (BMI: F (3, 223)=112.25, p=0.0000; ASf: F (3, 223)=118.60, p=0.0000) and in boys (BMI: F (3, 157)=55.594, p=0.0000; ASf: F (3, 158)=142.88, p=0.0000).

TABLE 2

BMI AND AVERAGE SKINFOLD THICKNES VALUES IN GIRLS AND BOYS WITH DIFFERENT SOMATOTYPES

Somatotypes	N	BMI			Average skinfold thickness		
		$\overline{X}$	Std. dev.	Std. err	$\overline{X}$	Std. dev.	Std. err
Girls							
Astenoid type	21	16.01	0.96	0.21	6.80	1.44	0.32
Thoracal type	118	18.87	1.86	0.17	9.81	2.64	0.24
Muscular type	62	20.84	1.77	0.23	12.39	3.09	0.39
Digestive type	26	26.05	3.83	0.75	21.41	5.28	1.04
Boys							
Astenoid type	11	16.12	1.18	0.36	4.80	0.41	0.13
Thoracal type	78	18.19	1.69	0.19	5.88	1.47	0.17
Muscular type	57	20.56	2.08	0.28	6.80	2.20	0.29
Digestive type	15	24.65	3.82	0.99	20.68	6.72	1.73

In Arkhangelsk girls of the first age group (G1) significant correlations were revealed between somatotypes (astenoid – thoracalis – muscularis – digestive)[27] and evaluations of one's own shape (r_S=–0.283, p<0.05), weight (r_S=0,387, p<0.05), fear to increase weight (r_S=0.275, p<0.01) and attempts to change their weight (r_S=0.265, p<0.05). Thus, girls were less satisfied with their own shape and weight, parallel to changes of somatotypes from the astenoid one to the digestive one. At the same time, they were more afraid to increase weight, and were more willing to reduce weight.

As shown in Table 3, those girls who belonged to muscular or thoracal somatotypes (both types are characterized with low fat development) predominantly described their body shape as »good« or »excellent« – scores 4 and 5 in 5-scorred scale. Among girls of digestive somatotype, characterized with strong development of fat, 80.0% evaluated their shape with scores »2« and »3« (»bad« and »satisfactory«) and only 20.0% chose the rank »4« (»good«).

TABLE 3
SELF-EVALUATION OF BODY SHAPE BY GIRLS WITH
DIFFERENT SOMATOTYPES

Individuals by somatotypes			Shape evaluation (scores)			
Somatotypes	N	%	2	3	4	5
			%	%	%	%
Astenoid type	7	6.5	0.0	14.3	57.1	28.6
Thoracal type	39	36.5	7.5	27.5	47.5	17.5
Muscular type	26	24.3	8.0	28.0	52.0	12.0
Digestive type	10	9.4	50.0	30.0	20.0	0.0

Most of the »leptosomic« girls (representing thoracal or astenoid types) were satisfied with their weight (52.7% and 85.7% correspondingly), while 90.0% of girls with digestive type, and 60.9% of girls with muscular type would like to reduce their weight. Fear to increase weight was characteristic for most of the girls with digestive type (90.0%), 60.0% of girls with muscular type and 57. 9% of girls with thoracal type; only girls of astenoid type were not afraid to put on more weight (0%).

In the 2nd group of elder girls (G2) the same trends were also found, but the differences were not statistically significant.

In Arkhangelsk boys there were no statistically significant correlations between somatotypes and the results of self-evaluation of one's own appearance. However some tendencies could be traced. The boys in B1 group who belonged to digestive type were mostly afraid to have an increase in their weight (33.3%); for comparison: in boys of muscular or thoracal types the corresponding figures were 14.3% and 13.6%. Also 66.7% of boys with digestive somatotype evaluated their body shape as »satisfactory«, while in boys of muscular and thoracal types the most frequent answer was »good« (47.6% and 60.9% correspondingly).

In the B2 group all those questioned belonged either to muscular or thoracal types. While in the B1 group the boys of those types demonstrated similar tendencies, in elder boys the differences were revealed: 50.0% of »muscular« boys evaluated their figures as »satisfactory«, while 75.0% of boys with more leptosomic body build (thoracal type) considered their shape as »good«. 87.5% of »muscular« boys were satisfied with their body weight, while in boys with thoracal type it was only 56.3%, and the rest (43.8%) would like to have a bigger weight.

The choice of a number of figure at Stunkard's rating scale, which corresponded to one's own figure, had a positive correlation with individual BMI values both in boys and in girls (p<0.01). Heavier and fatter boys and girls showed fatter figures at Stunkard's scale as corresponding to their own ones, thinner children pointed out to the thinner ones. However, elder girls estimated themselves heavier than they were in reality: more than half of the girls in the elder group with BMI less than 19 (»underweight category«) identified themselves with figures 3 and 4 (normal weight, BMI from 20.9 to 23.1). They were also more prone to overestimate their weight.

The fear to have their weight increased was positively and significantly connected with individual BMI values in younger girls (p<0.01), while in the elder group this tendency was not significant (p=0.07). However the percentage of girls, who gave positive answer to the question of their fears to have weight increase, practically did not change in both age groups (59.2% and 57.9% correspondingly).

In boys there were significant positive correlations between BMI values and the desire to have lower weight both in younger and elder boys (p<0.01).

Sex and age changes in self-perception

In general, Arkhangelsk boys and girls in both age groups were positive in their self-evaluation. Most of them evaluate their body appearance as »average« and their body shape with the scores »3« or »4«, i.e. »satisfactory« or »good«, with the predominance of the estimate »good« (Table 4). Significant differences between adolescences of both sexes were not found.

TABLE 4
SELF-EVALUATION OF BODY SHAPE PARAMETRS BY GIRLS
AND BOYS

Surveyed children		Described their body shape as				
		Very bad	Bad	Satis-factory	Good	Excellent
Sex	N	%	%	%	%	%
Girls	172	1.7	12.2	33.1	42.5	10.5
Boys	114	0.0	5.9	33.1	48.0	13.0
		Wishes to weigh less	Weight suits me	Wishes to weigh more		
Girls	172	59.3	38.2	2.5		
Boys	114	17.2	55.7	27.1		
		Tries to reduce weight	Does not try to change weight	Tries to increase weight		
Girls	172	38.8	56.7	4.5		
Boys	114	12.7	69.3	18.0		
		Afraid to increase weight	Does not afraid to increase weight			
Girls	172	58.7	41.3			
Boys	114	15.8	84.2			

As shown in Table 4, more than half of the girls preferred to weigh less, and only one third of the respondents considered their weight as »normal«. Most of the boys were satisfied with their weight. About half of the girls did not incline to change their weight, while among those who wanted to change their weight, 89.6% tried to reduce it.

Most of the boys did not intend to change weight, and those who thought about it, were more likely to increase it. All girls who wanted to change weight liked to reduce it and were afraid of its increase, while predominant number of boys did not express such fears. In this case differences between the representatives of two sexes were highly significant (p<0.001).

Both boys and girls mainly chose figure »4« of Stunkard's rating scale as the most attractive male figure, and figure »3« as the most attractive female figure (48.2% and 52.2% correspondingly). These were the figures classified as »normal« in weight. Even so, most of the boys related themselves to the most attractive male figure »4« (39.1%), while girls often (38.2%) attributed themselves to female figure »4«, which deviated from the »most attractive female« figure 3 by higher BMI (Table 1).

At all ages' adolescents of both sexes prefer to choose figure »4« – 38.4% (girls – 37.5%, boys – 39%). Elder girls (G2) tend to choose slimmer figures 2 and 3 more often as the ideal ones for females (74.4% vs 57.3% in the group G1). In boys the preference of figure »3« also increased with age (19.1% in B2 vs 8.2% in B1) but in general in both age groups there was a predominance in the preference of figure »4« (53.3% and 43.3% correspondingly).

In younger age groups (B1 and G1) correlation between one's own figure chosen at the rating scale and »good« figure was high (r$_S$=0.49 for G1, r$_S$=0.50 for B1; p<0.05). In elder girls – r$_S$=0.41; p<0.05, in boys of elder ages there were no connections between these two variables.

Self-perception, food habits and physical activity

There was a positive significant correlation between a person's positive answer about dieting and his or her wish to reduce weight. This was true for the girls of G1 (p<0.05) and G2 (p<0.01) groups, and also for the boys of B1 group (p<0.01). The same tendency was revealed in the B2 group but the connection was non-significant.

A number of girls keeping to a diet was growing with age: 12.0% in G1 group and 20.2% among G2. On the contrary, in boys there was an opposite trend: 12.2% in B1 and 7.3% in B2 group kept to a diet. Those who were dieting had less snacks (p<0.01) and consumed less flour products (p<0.01).

No correlation between physical activity and self-perception of one's body weight was revealed. 65.4% of the studied girls did not go in for sports, while 61.1% of boys attended different sports programs.

Comparisons between self-perception of their physical appearance in girls of different ethnic groups

No statistically significant differences were found between Russian and Kalmyk 16–17-year-old girls in height, weight or BMI. Significant differences were revealed for skinfold thickness over triceps (F(1.374)=12.629,

p=0.00043), abdominal (F(1.374)=26.320, p=0.00000) and suprailliac (F(1.374)=8.7228, p=0.00334) skinfolds, for chest (F(1.374)=4.1543, p=0.04223), arm (F(1.374)=7.4827, p=0.00653) and forearm (F(1. 374)=4.4948, p=0.03466) circumferences. As shown in Figures 2 and 3, mean values of these traits were larger in Kalmyks girls.
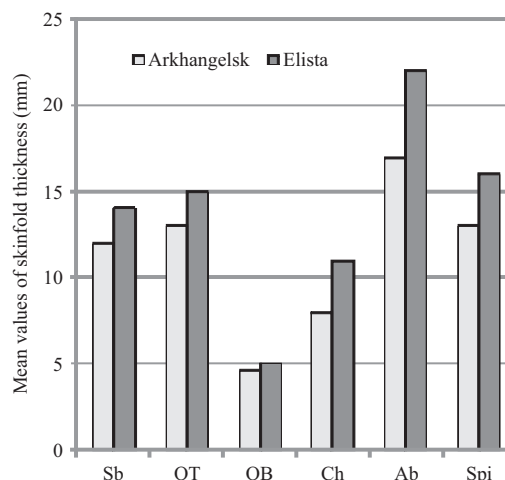

Fig. 2. Mean values of skinfold thickness in Arkhangelsk and Elista girls. Sb – subscapular, OT – over triceps, OB – over biceps, Ch – chest, Ab – abdominal, Spi – suprailiac.
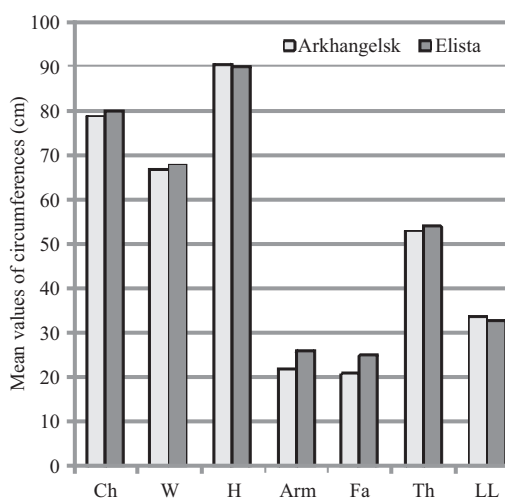

Fig. 3. Mean values of body circumferences in Arkhangelsk and Elista girls. Ch – chest, W – waist, H – hips, A – arm, Fa – forearm, Th – thigh, LL – lower leg.

When the questionnaire results were compared, no differences were found between Russian and Kalmyk girls in estimation of their height and weight, fear of weight increase, wish to change weight and attitudes towards dieting.

Significant differences were found in the evaluation of one's own body shape (according to the Stunkard's figures): mean score for the Russian girls of Arkhangelsk city

was 3.43, while for Kalmyk girls of Elista – 2.74 (p<0.05). As an »ideal« male figure, 54.1% of Russian girls chose Figure 4, while 55.8% of Kalmyk girls — Figure 3 (p<0.01) at Stunkard's rating scale.

Discussion

Physical attractiveness to a certain degree could be a »medical certificate« of health and physical status of an individual[31].

Distorted perception of one's body is typical not only for anorectic patients[32], but also for healthy individuals, particularly in puberty[33]. Starting from the age of 9, girls express urgent wish to loose weight[34]. Many authors have shown that ideals of thinness, dissatisfaction with one's body and eating disorders are much more typical for women than for men[35,36].

According to our data, a reduced self-esteem was only seen in answers to the question about evaluation of one's weight (predominance of »overweight« answers), particularly in girls. This coincides with modern standards about »ideal« female figure, which was becoming slimmer and slimmer in different adverts, movies, »glossy« magazines etc[37]. Thus, an »average« American woman is 162.5 cm in height and 63.5 kg in weight, while an »average« model's parameters are 180.3 cm and 53 kg[38]. The evaluation of appearance can be more objective when it relates to some general public, and more subjective when it involves personal self-evaluation[39,40].

In modern Russian girls significant correlations were found between the estimation of their bodies and their somatic status. It was shown that the estimation of one's body shape, weight, the fears to have weight increased, and the wish to change it, were significantly correlated with somatotypes. The girls with more »leptosomic« somatotypes (»astenoid« and »thoracal« types) were mostly satisfied with their bodies. Similar results were reported by other authors who revealed that satisfaction with one's own physical appearance increased with an increase in ectomorphy[41].

The girls of »heavier« body build – of picnic/»digestive« and athletic/»muscular« types – were more critical to their appearance and were afraid of increase in weight. Dissatisfaction with their own body and weight was expressed in girls of »digestive« type already in early puberty (the 1st age group, G1, mean age – 14.2±1.22 years). This can be explained by a strong influence of mass-media stereotypes on self-evaluation of girls, even at younger age.

»Ideal« male body is more connected with functional characteristics[42]. Images announced in mass-media as »attractive« were more variable from morphological point of view[43]. However, fears concerning their physical appearance were also typical for men but to a lesser degree than for women[44].

We analyzed self-perception of their bodies in healthy boys of different somatotypes. Dissatisfaction with their bodies and weight was revealed in boys of »digestive« type in younger age group. In elder boys there were more com-

plicated relationships between self-assessment of one's shape and weight. Thus, more »leptosomic« boys of »thoracal« type were satisfied with their shape but at the same time wanted to increase their weight. The boys of »muscular« type were less satisfied with their body shape but were happy about their weight.

The wish of »thoracal« boys to have more weight could be interpreted as an urge to have more muscles. May be for the same reason Lithuanian 16–19-year-old males were prone to exaggerate not only their height but their weight as well[45]. It should be noted that apart from less developed fat and muscle mass, boys of »thoracal« type were somewhat taller than those with »muscular« somatotype (though non-significantly), which could be reflected in visual perception of body shape differences[27].

At younger ages most of the children (both boys and girls) wished to be taller. At elder age groups boys still wanted to be taller, while girls were more satisfied with their own stature. In boys and girls at all age groups smaller height values significantly correlated with their wish to be taller: $r_s=-0.301$ for the boys and -0.408 for the girls (p<0.05). However in boys correlation coefficients decreased with age ($r_s=-0,340$ for B1, $r_s=-0,284$ for B2; p<0.05), and in girls, on the contrary, increased ($r_s=-0,230$ for G1, $r_s=-0,533$ for G2; p<0.05). It seems that girls were more realistic in their judgments, while boys irrespective of their own height just wanted to be taller.

Higher scores of self-assessment of their body shape in boys of »thoracal« type, when compared to those of »muscular« type, showed that physical strength and muscularity were not the most important criteria. Height was very important for the boys, and possibly that is why they preferred »leptomorphic« body build if it was associated with taller stature.

The differences in their attitude towards body weight between adolescents of two sexes might be of qualitative nature: for girls, weight always meant »fat«, while for the boys it was more about »muscles«. Self-evaluation of their own figure by adolescents of both sexes was significantly connected with their real body measurements, which meant that in general teenagers were adequate in their self-perception. There was a negative correlation at all ages, both for boys and for girls, between their actual stature and wish to be taller ($r_s=-0.301$ и $r_s=-0.408$, p<0.05). However, more than half of the studied boys wished to be taller, and in the elder age group (B2) 43.8% of leptosomic boys of thoracal type wished to increase their weight.

There were significant positive correlations between BMI values and the desire to have lower weight in younger girls and in younger and elder boys (p<0.01), while in girls of the elder group this was non-significant (p=0.07). Even the girls of underweight category in G2 group considered themselves »fat«, and wished to reduce their weight.

Many authors used BMI as an approximation of body fat development, which was in turn connected with the attractiveness of female figure[46,47]. In our study, somatotypes were used and their connection with BMI and sub-

cutaneous fat was shown. Thus, it may be concluded that with the increase of fatness, girls were becoming less satisfied with their shape and weight, while fear to increase weight was growing as well as the decision to do something to reduce weight.

Our results confirm other data[36] that participants of the study were objective in their self-perception but consistently evaluated slimmer bodies as more attractive. Both boys and girls mainly choose figure »3« (BMI=20.9) as the most attractive female figure at Stunkard's rating scale. Some authors[46,48,49] showed that there were no gender differences in evaluation of female body attractiveness by adults, or in high assessment of slimness by adult males and females[36,50]. According to our data, boys and girls at all ages had different attitudes towards female and male figures (p=0.000): they agreed in their assertions that males' bodies should be broader and heavier, while females' bodies should be slimmer. Both boys and girls mainly chose at Stunkard's rating scale figure »4« as the most attractive male figure, and figure »3« as the most attractive female figure (48.2% and 52.2% correspondingly). In both age groups boys significantly differed from girls in their assessment of male figures (p=0.001at younger age groups, p=0.031 at elder ones). To their opinion, males could be more robust. Girls of the 2nd age group chose slimmer female figures as »better ones« more often than all other studied children (p=0.018). Besides, boys' attitude did not change with age, while elder girls (G2) became more demanding to female figures and less demanding to the male ones.

Both boys and girls chose a thinner figure than their own as an ideal one for their own sex: average scores for an »ideal« female and male figure were 3.27 and 3.72 correspondingly, while average scores for their own figures were 3.70 for girls and 3.87 for boys. Both boys and girls were more demanding to female figure than to the male one: average scores of »ideal« figures were 3.17 for females and 3.66 for males. Girls were even more demanding to the thinness of female figure (average scores of »ideal« female figure were 3.11 and 3.42 for »ideal« male figure). This tendency was increasing with age: 3.33 was the average score for »ideal« female figure in G1 and 3.00 – in G2. All these differences were statistically significant (p<0.005). On the contrary, in elder boys (B2) no statistically significant differences were found in evaluation of their own figure (average score 3.8) and the choice of the »ideal« male figure (3.9).

Clear gender differences in the evaluation of »ideal« female and male figures could be connected with more intensive pressure of mass-media stereotypes. However, the preferred figures fell into the range of normal BMI categories, not »underweight« ones, which were prevailing in modern beauty cannons.

The fact that significant correlations between somatotypes or BMI with the wish to loose weight disappeared in 16–17-year-old girls (G2) may serve as an evidence of mass-media stereotypes pressure: the objectivity of self-perception was decreasing. Another evidence of the same trend was demonstrated by the result that more than half of G2 girls in the underweight category chose the Stunkard's figure with normal weight as the one representing their appearance. Both boys and girls in the 2nd age groups chose female figure 3 and male figure 4 as the most attractive ones. In other words, their estimations stayed in the limits of normal BMI values. Nevertheless, significant positive correlation between a chosen »ideal« figure and self-estimated scores demonstrated that the adolescents under study were in general satisfied with their body shape. Spearman rank correlations (notwithstanding age groups) between the chosen number of their own figure and the number of »ideal« figure were as follows: in girls with the number of the best female figure r_S=0.44, and the number of the best male figure r_S=0.25; in boys with the number of the best female figure r_S=0.25, and the number of the best male figure r_S=0.35 (p<0.05).

It is worth noting that in girls significant and positive correlation between the chosen numbers of figures and their own weight was present at all ages (r_S=0.51 for G1, r_S= 0.58 for G2, p<0.05), while in boys it was demonstrated only for the younger age group, B1 (r_S=0.27, p<0.05).

It was shown that there were some ethnic differences in self-perceptions of one's own body. In the UAE adolescent girls dissatisfied with their physical appearance were more numerous than in the US – 66% vs 60%[51]. In the USA adolescents of American Indian origin demonstrated more serious distortions in their self-esteem and eating behavior than their counterparts of European ancestry[52]. These results were explained by the change of traditional ethnic models of physical appearance evaluation.

Comparison of the results for Russian and Kalmyk girls did not show any differences in the most of self-estimation scores. However, Kalmykian girls had a low score in the estimation of their body shape, which may be connected with their subcutaneous fat development. According to anthropometric measurements, it was higher than in Russians. It can also be explained by the traditional Kalmyk beauty »cannons«: in pastoralists' populations stereotypes for female beauty were represented by lean women with small and well-shaped busts[53]. This was particularly typical for the populations of Northern Caucasus, Kalmyks and some peoples of Central Asia. According to E. Guchinova, a specialist in the sociocultural anthropology of Kalmyks, plump forms in Kalmyks were considered as »anti-ideal«. They were considered appropriate for adult matrons but not for the young girls[54].

There is a lot of information in scientific and popular literature about physical activity as the main tool for keeping a healthy body. Mass media broadly advertise fitness classes both for achieving »ideal« body shape and good physical status[55,56]. It was also shown that physical activity is more efficient than dieting in the quest of »thinness«[57]. At the same time, there were some data that low self-perception and self-esteem led to avoidance of physical activity and sports practices[58].

Though there were a lot of girls who wish to lose weight, according to our data, there were no significant correlations between girls' wishes and their going in for sports.

On the other hand, significant correlation (r_S=0.35; p<0.05) was found between this wish and dieting. In their choice of practical means to lose weight both Russians and Kalmyk girls preferred to keep to a diet. This leaves an open question of what should be done to make sports practice more popular and available for teenagers in Russia and other countries.

Conclusion

The results of the present study show significant correlations between somatotypes of the subjects, their BMI and self-assessment of their physical appearance. Girls were more critical than boys in their self-perception. This trend was growing with age, as well as the girl's wish to control her own weight. In self-perception of one's own body weight was the most important characteristics in girls, while stature – in boys.

No differences were revealed in most of self-estimation scores between Russian girls of Arkhangelsk city and Kalmyk girls of Elista, apart from the fact that the latter had a lower score in the estimation of their body shape, which may be connected with their fat development and their traditional values.

When selecting »ideal« figures at the Stunkard's rating scale, most of the examined subjects selected the figures that fell into the range of normal BMI values.

The strategies chosen by adolescents for modifications of their bodies in their quest for »ideal« figures were in favor of dieting versus physical activity, which puts the question of popularization of physical culture and sports on a nation-wide scale.

Acknowledgements

REFERENCES

1. DE MOLA CL, PILLAY TD, DIEZ-CANSECO F, GILMAN RH, SMEETH L, MIRANDA JJ, published 28 Nov 2012, PLOS ONE. DOI: 10.1371/journal.pone.0050252. – 2. SERVIÁN-FRANCO F, MORENO-DOMÍNGUEZ S, REYES DEL PASO GA, published 01 Apr 2015, PLOS ONE. DOI: 10.1371/journal.pone.0122737. – 3. GOLAN M, HAGAY N, TAMIR S, published 11 Mar 2014, PLOS ONE. DOI: 10.1371/journal.pone.0091778. – 4. RIETSCH K, GODINA E, SCHEFFLER C, published 23 Jul 2013, PLOS ONE. DOI: 10.1371/journal.pone.0068195. – 5. GODINA EZ, Human Physiology, 35 (6) (2009) 770. – 6. GODINA EZ, KHOMYAKOVA IA, ZADOROZHNAYA LV, PERMYAKOVA EY, SVISTUNOVA NV, STEPANOVA AV, GHILYAROVA OA, ZUBAREVA VV, Vestnik Moskovskogo Universiteta, Series 23. Anthropologia, 3 (2011) 68. *In Russian* – 7. TUTKUVIENE J, Anthropologischer Anzeiger, Bericht uber die biologisch-anthropologische Literatur, 63 (1) (2005) 29. – 8. World Health Organization. Technical report series 894: Obesity: Preventing and managing the global epidemic. (PDF). Geneva: World Health Organization, (2000) ISBN 92-4-120894-5. – 9. CABALLERO B, Epidemiol Rev, 29 (2007) 1. DOI:10.1093/epirev/mxm012. PMID 17569676. – 10. Global prevalence of overweight and obesity, retrieved 01.08. 2016. Available from: www.worldobesity.org (PDF). – 11. PINE KJ, Clin Child Psychol Psychiatry, 6 (2001) 519. DOI: 10.1177/1359104501006004006. – 12. Truby H, Paxton SJ, Br J Clin Psychol, 41 (2002) 185. DOI: 10.1348/014466502163967. – 13. KENARDY J, BROWN W, VOGT E, Eur Eat Disord Rev, 9 (2001) 242. DOI: 10.1002/erv.388. – 14. MCCABE MP, RICCIARDELLI LA, Eur Eat Disord Rev, 9 (2001) 335. DOI: 10.1002/erv.389. – 15. KILLEN JD, TAYLOR CB, HAYWARD C, WILSON DM, HAYDEL KF, HAMMER LD, SIMMONDS B, ROBINSON TN, LITT I, VARADY A, KRAEMER H, International Journal of Eating Disorders, 16 (1994) 227. – 16. BESSENOFF GR, Psychol Women Q, 30 (2006) 239. DOI: 10.1111/j.1471-6402.2006.00292.x. – 17. CLARK MM, CROGHAN IT, READING S, SCHROEDER DR, STONER SM, PATTEN CA, VICKERS KS, Body Image, 2 (2005) 263. – 18. STICE E, BEARMAN SK, Developmental Psychology, 37 (2001) 597. – 19. XUA Q, ANDERSONA D, LURIE-BECKB J, Obesity Research & Clinical Practice, 5 (4) (2011) e267. – 20. ABBATE-DAGA G, GRAMAGLIA C, MALFI G, PIERÒ A, FASSINO S, Eur Eat Disord Rev, 15 (2007) 471. DOI: 10.1002/erv.770. – 21. Godina EZ, Khomyakova IA, Zadorozhnaya LV, Anthropol Anz, 73 (1) (2016) 45. DOI: 10.1127/anthranz/2015/0599. – 22. BOUNAK VV, Anthropometriya, (Moscow, 1941). *In Russian* – 23. WEINER JS, LOURIE JA, Eds, Practical human biology, (Academic Press, London, 1981). – 24. COLE TJ, BELLIZZI MC, FLEGAL KM, DIETZ WH, BMJ, 320 (2000) 1240. – 25. COLE TJ, FLEGAL KM, NICHOLLS D, JACKSON AA, BMJ, 335 (2007) 194. – 26. SHTEFKO VG, OSTROVSKY AD, Skhemy klinicheskoi diagnostiki konstitutsional'nykh typov (Schemes of clinical diagnostics of constitutional types). (GosMedIzd, M-L, 1929). *In Russian* – 27. Physique and Character: an Investigation of the Nature of Constitution and of the Theory, Routledge, accessed 07.31.1999. 364 p. Available from: http://imsoftwareinc.com/wp/International-Library-of-Psychology-Physique-and-Character-an-investigation-of-the-nature-of-constitution-and-of-the-Theory-book/download-1274237482/. – 28. TUTKUVIENE J, Acta medica Lituanica, 8 (2001) 32. – 29. STUNKARD A, Perceptual and Motor Skills, 90 (2000) 930. – 30. BULIK CM, WADE TD, HEATH AC, MARTIN NG, STUNKARD AJ, EAVES LJ, Int J Obes Relat Metab Disord, 25 (10) (2001) 1517. – 31. GRAMMER K, FINK B, MØLLER AP, THORNHILL R, Biol Rev Camb Philos Soc, 78 (2003) 385. DOI: 10.1017/S1464793102006085. – 32. BRUCH H, Psychosomatic Medicine, 24 (1962) 187. – 33. GARFINKEL PE, GARNER DM, MOLDOFSKY H, STANCER HC, Psychosomatic Medicine, 38 (1976) 327. – 34. SCHUR EA, SANDERS M, STEINER H, International Journal of Eating Disorders. 27 (2000) 74. – 35. JOHANSSON L, LUNDH LG, ANDERSSON G, Indiv Differ, 38 (2005) 723. DOI: 10.1016/j.paid.2004.05.026. – 36. BROWN FL, SLAUGHTER V, Body Image, 8 (2011) 119. DOI: 10.1016/j.bodyim.2011.02.002. – 37. WISEMAN CV, GRAY JJ, MOSIMANN JE, AHRENS AH, International Journal of Eating Disorders, 11 (1992) 85. – 38. National Eating Disorders Association Educator Toolkit, National Eating Disorders Association, accessed: 20.05.2014. Available from: http://www.nationaleatingdisorders.org/uploads/file/toolkits/NEDA-Toolkit-Educators_09-15-08.pdf. – 39. CALVO-MERINO B, JOLA C, GLASER DE, HAGGARD P, Conscious Cogn, 17 (2008) 911. DOI: 10.1016/j.concog.2007.11.003. – 40. Cela-Conde CJ, Agnati L, Huston JP, Mora F, Nadal M, Prog Neurobiol, 94 (2011) 39. DOI: 10.1016/j.pneurobio.2011.03.003. – 41. MONSMA EV, MALINA RM, FELTZ DL, the American Alliance for Health, Physical Education, Recreation and Dance, 77 (2) (2006) 158. – 42. BROWN WM, CRONK L, GROCHOW K, JACOBSON A, LIU CK, POPOVIC Z, TRIVERS R, Nature, 438 (2005) 1148. DOI: 10.1038/nature04344. – 43. HUMPHREYS P, PAXTON SJ, Body

Image, 1 (2004) 253. – 44. WELTZIN T, WEISENSEL N, FRANCZYK D, BURNETT K, KLITZ C, BEAN P, Journal of Men's Health and Gender, 2 (2005) 186. – 45. TUTKUVIENË J, PAULIKAITË G, PAVLOVS-KAJA E, MOKSLO D, Laboratorinë medicina, 16, 1 (61) (2014) 48. – 46. Smith KL, Cornelissen PL, Tovée MJ, Evol Hum Behav, 28 (2007) 4. DOI: 10.1016/j.evolhumbehav.2006.05.007. – 47. STREETER SA, MCBUR-NEY DH, Waist-to-hip ratios and female attractiveness: comparing apples, oranges and pears. In: FURNHAM A, SWAMI V (Eds) The Body Beautiful: Evolutionary and Socio-Cultural Perspectives (New York, Palgrave Macmillan, 2007). – 48. WINKLER C, RHODES G, Br J Psychol, 96 (2005) 141. DOI: 10.1348/000712605X36343. – 49. SMITH KL, TOVÉE MJ, HANCOCK PJ, BATESON M, COX MA, CORNELISSEN PL, Vis Cogn, 15 (2007) 927. DOI 10.1080/13506280601029515. – 50. CORNELISSEN PL, HANCOCK PJB, KIVINIEMI V, GEORGE HR, TOVÉE MJ, Evol Hum Behav, 30 (2009) 417. DOI: 10.1016/j.evolhumbe-hav.2009.04.003. – 51. EAPEN V, MABROUK AA, BIN-OTHMAN S, Eating Behaviors, 7 (2006) 53. – 52. LYNCH WS, HEIL DP, WAGNER E, HAVENS MD, Body Image, 4 (2007) 179. – 53. BUTOVSKAYA ML, Tainy pola. Muzhchina i zhenschchina v zerkale evolutsii (Mysteries of sexes. Man and woman in the mirror of evolution) (Vek 20, Fryazino, 2004). – 54. GUCHINOVA EB, Postsovetskaya Elista. Vlast, bisness i krasota. Ocherki socialno-kulturnoi antropologii kalmykov (Post-Soviet Elista. Power, business and beauty. Essays of sociocultural anthropology of Kalmyks). (Aleteya, St.Petersburg, 2003). *In Russian* – 55. HOMAN K, Body Image, 7 (2010) 240. DOI: 10.1016/j.bodyim.2010.02.004. – 56. HOMAN K, MCHUGH E, WELLS D, WATSON C, KING C, Body Image, 9 (2012) 50. DOI: 10.1016/j.bodyim.2011.07.006. – 57. LUFF GM, GRAY JJ, Body Image, 6 (2009) 133. DOI: 10.1016/j.bodyim.2009.01.004. – 58. SHAW SM, KEMENY L, Adolescence, 24 (1989) 677.

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SAMOPERCEPCIJA FIZIČKOG IZGLEDA KOD ADOLESCENATA: ASPEKTI SPOLA, STAROSTI I ETNICITETA

SAŽETAK

Studija je koristila su podatke o 462 djevojčica i 372 dječaka ruske nacionalnosti, i 90 djevojaka iz Kalmikije u starosti od 12–17-godina. U obje skupine su djeca ispitana od strane istih istraživača prema istom protokolu istraživanju. Sve opažanja su provedena u skladu s bioetičkim procedurama; protokole pristanka su ispunili subjekti (starije djece) ili njihovi roditelj/i. Mjere za stajaću visinu, težinu, opseg tijela i debljinu kože su izmjereni na svim pojedincima koristeći standardnu tehniku izračuna indeksa tjelesne mase (BMI). U gradu arkhangelsk je ukupno 114 dječaka i 172 djevojčica ispunilo upitnike, a u elisti – 34 djevojaka su bile podijeljene prema spolu, dobi, somatotipu i nacionalnosti. Rezultati ovog istraživanja pokazali su značajne korelacije između somatotipa ispitanika, njihovog bmi-a i samoprocjene njihovog fizičkog izgleda. U samopercepciji tijela, težina je najvažnija karakteristika kod djevojaka, dok je kod dječaka to bio stas. Nema pronađenih razlika u većini rezultata za samovrednovanje kod ruskih djevojaka u Arkhangelsku i kalmikijskih djevojaka iz eliste, osim činjenice da su potonje imale slabije rezultate u procjeni oblika svog tijela, vjerojatno zato što su bile deblje. Strategije koje adolescenati odabiru za izmjene njihovih tijela u njihovoj potrazi za »idealnom« figurom su bile u korist dijeta u odnosu na fizičku aktivnost, koja postavlja pitanje popularizacije fizičke kulture i sporta na nacionalnoj razini.