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BODY FAT AND THE CONSTITUENTS OF PROSOMATIC ATTITUDES IN PRACTICE OF AN OUTDOOR PHYSICAL EDUCATION CLASS — A NEW SURVEY OF ADOLESCENTS

Introduction. Sedentary lifestyle and environmental degradation currently dominant in developed societies seem to be the main cause of health deterioration in societies; this problem touches an increasingly younger population [11; 14; 15]. The problem of excess weight among youths is being analysed in relation to its many prerequisites. Some of those are dietary habits, economic status [6; 13], genetic factors [13] and the level of sedentary behaviours. Much has been also said on the relations between excess weight and obesity with physical fitness [7] and physical activity of youth [10]. The latter should be given further examination, taking in the account the additional stimulation provided by factors like: suggestive advertising, examples of self-improvement set by celebrities, special training programmes or stimulating effect of the natural environment.

Therefore the aim of this work has been a comparison of the constituents to prosomatic attitude in the wide sense in children with varying thickness of skinfolds, as well as determining the significance of outdoor Physical Education classes in forming of such attitude.

This knowledge should be a base for the further analysis of the role of natural environment in formation of positive behaviours that reduce the risk of disease of affluence, significant for the surveyed youths now, as well as for their future health and fitness.

Material and method. The sample material was constituted of primary school students taking part in a research project that involved conducting most Physical Education classes in the natural environment surrounding the school. A group of 103 five-, and six-graders (49 boys and 54 girls) attended nearly two thirds of their classes (60%) as extracurricular activities.

Division of the sample group into two groups was based on the median of skinfold thickness. Thickness of body fat was measured as sum of the thicknesses of skinfolds under the gastrocnemius muscle and triceps surae muscle [3]. Body-fat calipers Fat Tester Accu-Measure Fitness 3 000 were used for both measurements.

In both measurements were used various tools — for the objective components of prosomatic attitude they were:

1) for evaluation of general fitness — the International Physical Fitness Test [8]. The general assessment of fitness for each participant was achieved by summarising the results of each part of the test;

2) for evaluation of knowledge — 15 questions test, abridged from a test of knowledge about physical culture. The subject of the test constituted general questions related with physical activity and its ecological prerequisites.

Another objective measure was participant's attendance at Physical Education classes, calculated during the final examination.

The tools used for assessment of the subjective constituents of prosomatic attitude were:

1. Strzyżewski Questionnary [2], measuring the attitude towards physical culture. A Likert scale was used, with the result of 0 points standing for a strongly negative attitude and 4 points for a strongly positive one.

2. A five grades scale [5] of mood and emotional attitude towards the lesson before its beginning. The result of 1 point on the scale corresponds to unhappiness and reluctance to participate in the lesson, the result of 5 points — good attitude and willingness to take part in the activities

3. The questionnare constructed by Baumgartner and Jackson for measuring the students attitude towards a particular Physical Education class [1].

4. Noble Borg scale, filled in by students immediately after the completion of Cooper test, used in the study as one of the aerobic tests and graded by the teachers. The scale is a subjective measure of endurance [4].

The collected data was statistically analysed, by means of the Statistica 10 software. The Mann—Whitney U test was utilised for measuring differences in skinfold thickness (table 1—3).

The differences between the beginning and final examinations were assessed by Wilcoxon signed-rank test. The significance level not exceeding 5% of random mistake ($p < 0,05$) (table 4).

T a b l e 1 — The initial assessment of objective and subjective constituents of prosomatic attitudes in students

Constituent of attitude towards physical culture	Students with lesser amount of body fat		Students with larger amount of body fat		*p*
	M	SD	M	SD	
Fitness	494,5	76,6	467	59,8	0,007
Knowledge	6	2,06	6	1,88	*ns*
Cognitive	2,46	0,31	2,23	0,36	0,006
Emotional	2,38	0,33	2,19	0,32	0,000
Behavioral	2,37	0,32	2,11	0,27	0,001

End table 1

Constituent of attitude towards physical culture	Students with lesser amount of body fat		Students with larger amount of body fat		*p*
	M	SD	M	SD	
Mood	4?0	0,33	4	0,81	*ns*
Assessment of the lesson	19,5	4	18	3,54	*ns*
Self-assessed exertion	4	1,48	4	1,48	*ns*

T a b l e 2 — The final assessment of objective constituents of prosomatic attitudes in students

Constituent of attitude towards physical culture	Students with lesser amount of body fat		Students with larger amount of body fat		*p*
	M	SD	M	SD	
Fitness	524,5	74,86	498	57,9	0,013
Knowledge	11	1,92	11	2,07	*ns*
Attendance (%)	89	5,96	85	5,95	0,002
Cognitive	2,79	0,30	2,54	0,31	0,004
Emotional	2,76	0,40	2,48	0,32	0,005
Behavioral	2,53	0,35	2,37	0,26	0,021
Mood	4	0,76	4	0,62	*ns*
Assessment of the lesson	20	3,43	19	3,25	*ns*
Self-assessed exertion	4	1,33	4	1,27	*ns*

T a b l e 3 — Comparison of results from the initial and final measurings of constituents of prosomatic attitude in the group of students with lesser amount of body fat

Constituent of attitude towards physical culture	Initial examination		Final examination		*p*
	M	SD	M	SD	
Fitness	494,5	76,6	524,5	74,86	0,000
Knowledge	6	2,06	11	1,92	0,000
Cognitive	2,46	0,31	2,79	0,30	0,000

End table 3

Constituent of attitude towards physical culture	Initial examination		Final examination		*p*
	M	SD	M	SD	
Emotional	2,38	0,33	2,76	0,40	0,000
Behavioral	2,37	0,32	2,53	0,35	0,000
Mood	4	0,33	4	0,76	0,000
Assessment of the lesson	19,5	4	20	3,43	0,000
Self-assessed exertion	4	1,48	4	1,33	0,000

T a b l e 4 — Comparison of results from the initial and final measurings of constituents of prosomatic attitude in the group of students with larger amount of body fat

Constituent of attitude towards physical culture	Initial examination		Final examination		*p*
	M	SD	M	SD	
Fitness	467	59,8	498	57,9	0,000
Knowledge	6	1,88	11	2,07	0,000
Cognitive	2,23	0,36	2,54	0,31	0,000
Emotional	2,19	0,32	2,48	0,32	0,000
Behavioral	2,11	0,27	2,37	0,26	0,000
Mood	4	0,81	4	0,62	0,002
Assessment of the lesson	18	3,54	19	3,25	0,000
Self-assessed exertion	4	1,48	4	1,27	0,004

Results. The initial examination revealed both objective and subjective measures of attitude to be significantly in favour for the students with thinner skin folds only in case of the general fitness and recovery heart rate as well as attitudes towards physical culture.

The final examination revealed an important change among the objective constituents of prosomatic attitude — it turned to be significantly higher ($p < 0,05$) in slimmer participants. The difference was not measured in the initial examination. Also attendance, calculated during the final examination,

was significantly better for the slimmer students. As in the initial examination, the final test did not reveal differences between the groups in their assessment of self mood, lessons or exertion. It did, however, reveal differences in the constituents of attitudes towards physical culture.

Comparison of the results obtained in both parts of the study points towards a statistically significant improvement in all the constituents of attitudes towards physical culture.

Summary and conclusions. In accordance with the common opinion, the students' levels of physical fitness turned out to be in significant correlation with amounts of body fat, as substantiated by the earlier research on the connections of body fat levels and the associated body mass index to physical activity and fitness as well as the remaining constituents of attitudes towards physical culture [6].

Earlier assessments of the connection between obesity and sedentary behaviours (excluding physical activity) exist. In the years 1970—1990 growth curve of the obese people was parallel to the curve of the number of sold cars and the average number of hours spent in front of a television set [10]. At the same time, many surveys point at the correlation between long periods of increased physical activity and decrease, or slowed in-time increase, in body mass [9], as well as generally improved mental state [12].

The results of the presented research points at the slimmer students' advantage, in both objective and subjective assessment of the general attitude towards physical activity. However, the hypothesis that Physical Education classes held outdoors would lessen the difference in prosomatic attitudes between students with smaller and larger amounts of body fat was not confirmed. Instead, there was an approximate in both groups increase of measured values of particular elements, probably induced by activity in the area surrounding the school.

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