LITHUANIAN SPORTS UNIVERSITY

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ADOLESCENTS' BODY IMAGE AND ANALYSIS OF EFFECTIVENESS OF BODY IMAGE IMPROVEMENT PROGRAM

Summary of Doctoral Dissertation

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INTRODUCTION

Our children grow and mature in the times, where image and media attention to a beautiful body is overestimated, and the social pressure for meeting image expectations influences and affects the development of immature persons. The less physical characteristics of a person meet social expectations, the more dissatisfied the person is with his/her body, the lower is self-esteem, and the bigger is propensity for depression and manipulation with food (Cash, Pruzinsky, 2004; Tiggemann, 2011).

The prevalence of overweight and obesity among children and teenagers is one of the most pressing public health problems (Haug et al., 2009; Rokholm, Baker, Sorensen, 2010; Dumith et al., 2010). In addition to obesity and eating disorders among teenagers, another great public health concern is huge dissatisfaction with their bodies, unhealthy weight loss behaviour and disordered eating. Therefore, recently great attention has been paid to psychological problems related with negative body image and the interrelations between eating disorders and physical activity has been analysed. It was found that dissatisfaction with body image has a negative effect on the physical and psychological development and health of teenagers. Adolescent dissatisfaction with appearance is related to low self-esteem that leads to eating disorders or disordered eating. Such behaviour is harmful to health and causes obesity (Haines, Neumark-Sztainer, 2006). Poor self-esteem is associated with a higher likelihood of becoming a victim of bullying (Jankauskiene et al., 2008), increased risk of suicide and deliberate self-harm (Rodrigues-Cano, Beato-Fernandes, Llario, 2006; Laskytė, 2009).

A large part of modern consumerist society is constantly concerned about weight loss/gain methods that promise rapid results (O'Dea, 2007; Bauman, 2011; Tereškinas, 2011). Seeking peer recognition and wanting to meet the society's expectations young people often exhaust themselves with diets and/or excessive exercise (O'Dea, 2007; Ojala et al., 2007; Sabbah et al, 2009; Jankauskienė, Pajaujienė, Mickūnienė, 2010; Tereškinas, 2011). Adolescents who are overweight or obese suffer from psychosocial stress caused by social

pressure to lose weight, have low self-esteem, are often dieting and are more likely to get depression compared to their peers with normal weight (O'Dea, 2005; Babio et al., 2008; McCabe, Ricciardelli, James, 2010).

The analysis into the effect of obesity and eating disorders prevention programs in the Western world has revealed that many of them are unsafe because they lead to higher numbers of teenagers who go on a diet, do weight control exercises hazardous to health, start smoking, are afraid to gain loss or develop a fear of food (O'Dea, 2002; O'Dea, 2005). The effect of obesity and eating disorders prevention programs on children and adolescent lifestyle and self-esteem has not been studied extensively in Lithuania. A number of studies of declarative nature have shown that Lithuanian teenagers are wrong in assessing their weight, e.g. they believe they are larger than they really are and go on a diet without any reason (Zaborskis et al., 2008), they exercise too little or not at all (Petronytė, 2009; Jankauskienė et al., 2011). Obesity and eating disorders prevention programs are not standardized and are based on parental understanding of healthy nutrition, physical activity and body weight control. Unfortunately, this understanding is not always correct.

Successful obesity and eating disorders prevention programs should first of all aim to reduce the dissatisfaction with personal appearance. In addition to teaching healthy lifestyle, they should be focused on teaching critical thinking about the images promoted by the media, developing tolerance to oneself and others, stress management and most of all on building self-esteem. Unfortunately, such education in our country is limited to delivering information about the optimal body weight and healthy nutrition. At best, the health education process ends with increased knowledge about weight control. Since no research data about the effectiveness of overweight prevention programs and changing personal attitude to body image are available, we may conclude that professional approach to education in this field is inadequate. For this reason, young people opt to follow pseudo scientific weight control recommendations on that abound in the media instead of seeking professional advice. Health educators along with physical education and other teachers must seek that obesity prevention programs would not induce negative body image,

biased judgement of personal body weight, not provoke eating disorders, not uphold the understanding that dieting, intensive exercising and imbalanced nutrition is a norm (O'Dea, 2005).

Until now research was mainly focused on disordered eating behaviour, whereas there are few studies into exercising behaviour to control the body weight. It is not clear how internalization of sociocultural ideals towards appearance is related to weight control behaviour and it is unknown how adolescents behave if they decide to lose weight by exercising. There is a lack of studies revealing the relationship between adolescent body image and health perception with the drive for thinness and muscularity in different physical activities and sports. Besides, studies that evaluate the relations of body dissatisfaction with physical activity are rather controversial: some studies claim that physical activity brings more body image satisfaction (Hausenblas, Fallon, 2006; Campbell, Hausenblas, 2009; Voks et al., 2009), whereas other studies assert on the contrary (Zabinski et al., 2001; Leone, Sedory, Gray, 2005; McCabe, Ricciardelli, James, 2007).

The above statements prove the relevance of research into the relations between adolescent body image, physical activity and weight control behaviour as well as body dissatisfaction prevention. There are very few studies analysing the said issues from the gender perspective. Therefore the following **problematic issues** have been raised in the research:

- How internalization (pressure) of sociocultural ideals towards appearance is related to self-esteem and body dissatisfaction in adolescents of both genders?
- How body dissatisfaction in adolescents is related with self-esteem, unhealthy weight control behaviour and lifestyle characteristics?
- Can physical activity protect adolescents from the development of body image dissatisfaction and its outcomes?
- What should be the contents of contemporary health education programs aimed for adolescent obesity and eating disorders prevention? Can health education programs based on building self-esteem and media literacy as well as cognitive dissonance strategy reduce body dissatisfaction in male and female adolescents?

The research is based on the following **theories:**

- *Tripartite Influence Mode of Body Image and Eating Disturbance* (Thompson, Coovert and Stormer, 1999; Keery, Van den Berg, Thompson, 2004), where it is assumed that body dissatisfaction and the risk of eating disorders are caused by social and cultural pressure (mass media, peers and parents), negative psychological condition, comparison of personal image with beauty standards and attempts to meet image expectations.
- *Theory of Social Comparison* (Festinger, 1954), assuming that individuals evaluate their own abilities by comparing themselves to others.
- *Theory of Cognitive Dissonance* (Festinger, 1957) explaining how existing cognitions dissonant factors are altered. This theory explains that people seek cognitive consonance, i.e. they need consistency between information, thoughts, values, attitudes, emotions and behaviour. If these components are inconsistent, there is a state of dissonance leading to stress or physiological excitation. The theory asserts that individuals have a motivational drive to reduce the dissonance by changing the existing conditions, i.e. modifying the system of beliefs or reducing the importance of any element leading to dissonance.
- *Social Learning Theory* (Rotter, 1954; Bandura, 1977, 1986, 2000) states that individuals learn from each other by observing, imitating and modelling (observing others, their behaviour, encrypting information and later using it in own activities). Observation, imitation and modelling may occur by directly observing the behaviour of other people, receiving verbal instructions or watching real and/or symbolic examples of other people seen in mass media.

Five **theoretical assumptions** were raised from problem questions:

H 1. Internalization of sociocultural ideals towards appearance is more common among adolescent girls and teenagers with higher body mass index as well as teenagers with lower self-esteem.

H 2. Teenagers who strive to internalize sociocultural ideals towards appearance are more often dissatisfied with their body; they lead unhealthy lifestyle, use unhealthy weight control methods more often and face negative outcomes of such behaviour more often.

H 3. Physical activity is related to higher self-esteem, less body dissatisfaction and healthier weight control behavior.

H 4. Internalization of sociocultural ideals towards appearance, lower self-esteem and body dissatisfaction are the main factors leading to unhealthy weight control.

H 5. A health education program has a positive effect on body image among adolescents, improves self-esteem, reduces the risk of disordered eating and improves the knowledge of exercise related weight control.

Research object is body image among adolescents and the effectiveness of educational program.

Research aim is to determine the characteristics of body image among adolescents and to investigate the effect of educational program on its correction.

To solve the problematic issues and verify the hypotheses the primary **research objectives** were to:

1. Determine the expression of body image and related factors in groups by of gender, body mass index and physical activity.
2. Find the relationship between body image and sociocultural, self-esteem, and unhealthy weight control behaviour factors.
3. Assess the factors that predict unhealthy weight control behaviour among teenagers.
4. Develop an educational program and evaluate its effectiveness for the improvement of body image and health literacy in body mass control.

Scientific novelty, theoretical and practical significance of the research

The analysis of body image among teenagers has drawn the attention to the interaction of particular personal and sociocultural factors in the period of adolescence. There are very few studies analyzing the said interrelationship among teenagers of both genders as most of the studies analyze the samples of female teenagers. Therefore, an innovative issue in this doctoral thesis is involvement of both genders in the study.

Another innovative aspect of this research is the analysis of body image

and related factors in groups of teenagers of different physical activity levels (not exercising at all, exercising for recreation and training for results). This analysis will supplement the scientific knowledge about the relation of physical activity and sports with body image. Little research has been done on physical activity as a protective weight control factor even in the Western world.

Until now just a few dozens of studies on the effectiveness of controlled representative health education programs conducted in schools to reduce body image dissatisfaction among children and teenagers were done globally (O'Dea, 2007). In our country it is an entirely new project. This study will help to reveal the effect of the said program on both genders in the period of middle adolescence (10-11 year old teenagers, mainly girls, were studied in the majority of educational programs). This program was used to test how it affects boys because very little studies with boys have been done in the world by now (O'Dea, 2007).

The conducted study and its scope is the first dissertation of this type in Lithuania. From theoretical point of view the research work is significant because, in addition to a detailed data analysis that helped to disclose the problem of body image and the key characteristics of unhealthy weight loss behaviour, the study provided the possibility to distinguish the key factors leading to the development of unhealthy behaviour (outcomes of the factors). The research results are important for the development of teenager obesity, eating disorders and unhealthy habits prevention strategies and also for the preparation and implementation of physical activity promotion and health education programs. Based on the research results the dissertation proposes practical recommendations on national, community and personal levels.

Dissertation structure and scope. The thesis consists of introduction, theoretical backgrounds (literature review), description of research methodology, presentation and discussion of research results and conclusions with recommendations. The evidence is presented in 56 tables and illustrated in 21 figures. The reference list consists of 441 sources. 17 annexes include permits to conduct the survey, sample agreements, permits to use the scales and tables of research results.

1. MATERIALS AND METHODS

1.1. Participants and procedure

Organization of the first survey. The permission to conduct the survey was given by the Department of Education of Kaunas Municipality. 16 randomly selected schools (N=10) and gymnasiums (N=6) of Kaunas were contacted, informed about the survey and asked for the permission to conduct the research. All of them agreed to participate in the study. Two-three 11th grade classes from each school were chosen randomly to participate in survey. Participants were informed that participation was voluntary. There were no refusals to participate in the survey and all the students present at school on that day were interviewed. All students (N=856) who were asked to participate in study agreed to fill in the questionnaires. The participants completed the anonymous questionnaires in the classrooms during a class period. Out of 856 questionnaires 51 were damaged, therefore, the data of 805 adolescents (mean age – 17.23 (0.6) years, 476 (58.9%) of them were females) were used for the analysis. The survey sample with 5 per cent error represents the population of 11 grade students from Kaunas (Pukėnas, 2009).

Organization of the second survey (educational experiment). The second survey was conducted with the support of the research Council of Lithuania (No MIP-22/2010) and performed in four stages. **Stage I of the educational experiment** was aimed to prepare for the project. Agreements were made by and between Lithuanian Academy of Physical Education (LAPE) and Kaunas City Public Health Centres, a permit from Kaunas Regional Biomedical Research Ethics Committee (No BE-2-62) and a permit from Kaunas City Department for Education were obtained. Students for the survey were selected. From the list of 53 educational institutions every third gymnasium (N=4), secondary school (N=10) and lower secondary education school (N=2) were selected. Two classes of 9th graders (Class 9b as experimental group and Class 9c as control group) were interviewed and

collaboration agreements were entered into with educational institutions selected for the survey. In this stage the educational program was designed (20 lessons), handouts for the training of public health specialists and the students were prepared, the survey questionnaire was developed and the test survey was conducted. **In stage II of the educational experiment** the selected school public health specialists were trained at the academy by LAPE scholars (16-hour training). At the same time the survey questionnaires were revised and finalized, consents of students and their parents (guardians) were collected and the first interviews were held. **In stage III of the educational experiment** the educational program was delivered in 9b classes of the selected schools (two 45-minute lessons per week). As many health education classes were planned (20 lessons), heads of Kaunas City Education Department and schools agreed to have these classes delivered by public health specialists during physical education, biology, ethics or religion classes, or during breaks between classes, or by substituting an ill teacher, and the like. **In stage IV of the educational experiment** the second interview of teenagers who have finished the health education program was conducted.

The sampling scheme is presented in Figure 1. There were 727 students in total in classes selected for the survey. 114 students or their parents did not give consent to participate in the study or the consents were not returned by the deadline. 30 students were absent from school on the interviewing day, four questionnaires were destroyed. Therefore, the sample of the first interviewing consisted of 579 subjects (293 students from experimental classes and 286 students from control classes). This number sufficiently represents the population of Kaunas schools 9^{th} graders with 5 per cent error (Pukėnas, 2009). In repeated interviewing out of 613 eligible students 67 were absent from school and 7 questionnaires were damaged. Therefore, 539 subjects were interviewed (271 students from experimental classes and 268 students from control classes).

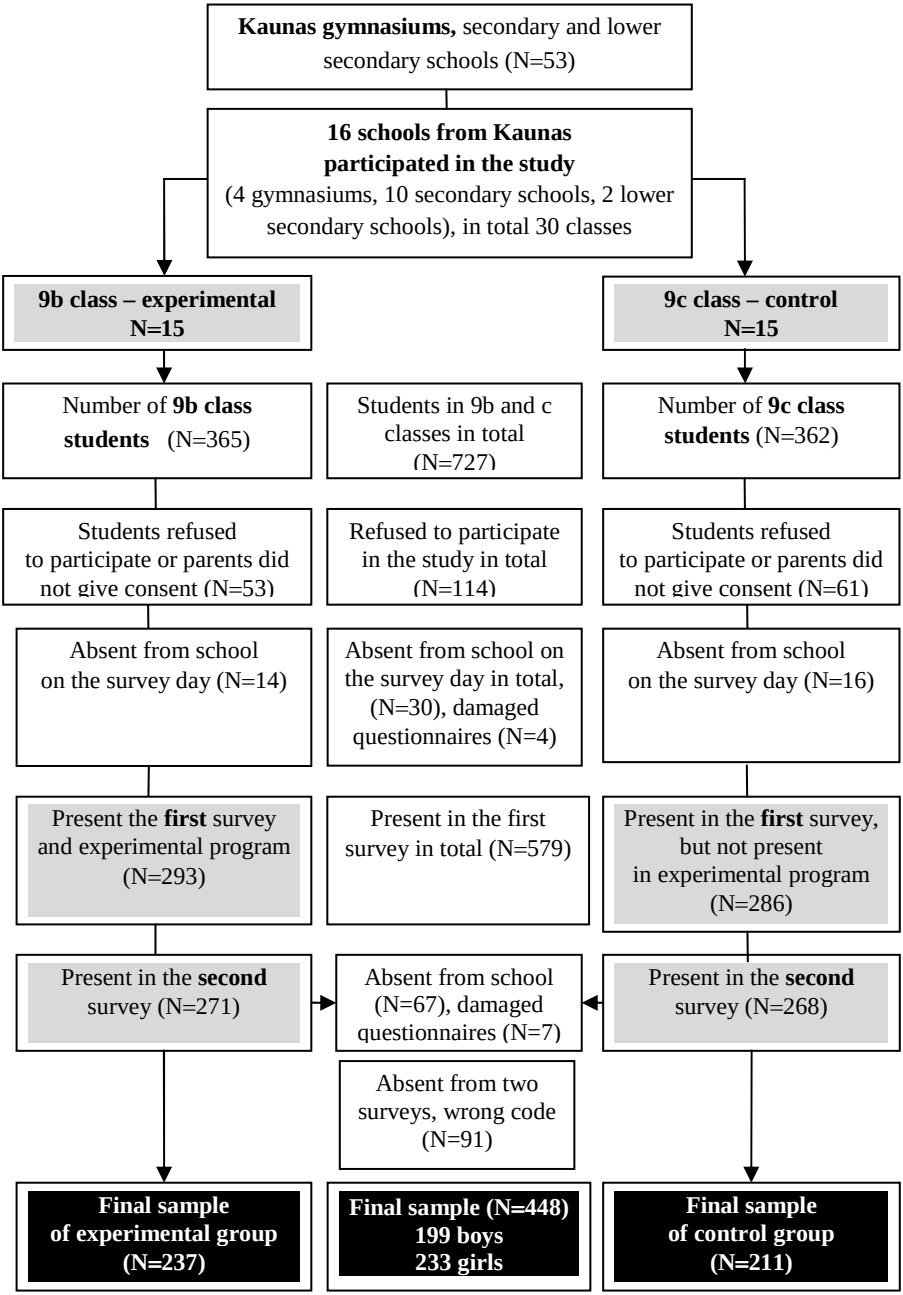

Figure 1. **Second survey sampling scheme**

The final sample was made after the second interviewing, when student data were entered by respective codes so that the data field would contain only the subjects who were present in the first and the second interviewing and who filled in the questionnaires correctly by writing their relevant code. 81 students were absent from one of the two interviews and 10 questionnaires had a wrong subject identification code, therefore these questionnaires were removed from the data field. The final sample for the analysis of health education program efficiency contained 448 subjects (191 boys and 237 girls). There were 237 students (52.9 %) in the experimental group and 211 (47.1 %) in the control group (Figure 2). The groups were identical in terms of gender (χ^2=2.17; df=1; p=0.14). The subjects' age ranged from 14 to 17 years with the average of 15 (0.42) years.

1.2. Methods of research

Methods of the first survey. The first survey was done by asking the students to fill in specially designed for this survey questionnaires consisting of different scales and demographic questions.

Sociocultural attitudes towards appearance scale (SATAQ-3, Thompson et al., 2004) was initially developed to assess media influences on feminine body image. Original SATAQ has 3 forms with four subscales: Internalization-General, Pressures, Information, and Internalization-Athlete. The internal consistency of the *Internalization-General* subscale (Cronbach α=0.88) was good. This scale reflects the acceptance (internalization) of media influence on body image. *Internalization-Athlete* subscale (Cronbach α=0.78) reflects the athletic body image idealization. *Pressures* subscale (Cronbach α=0.85) reflects media pressure to have a perfect appearance and seek the behaviour which contributes to achieving this look. *Information* subscale (Cronbach α=0.75) describes the importance of media in shaping the standards of appearance. The scale is composed of the Likert-items with 5 response options, where 1 means definite disagreement and 5 means definite agreement.

The higher the score, the greater is the acceptance or internalization of the prevailing sociocultural standards for appearance is. The questionnaire was translated into Lithuanian with the permit of Professor J. K. Thompson by using a double translation method. SATAQ–3–L questionnaire was validated in the sample of teenagers (Miežienė, Jankauskienė, articles in the press).

Body image was assessed by means of *The Multidimensional Body-Self Relations Questionnaire* (MBSRQ-AS, Cash, 2004) *Body Areas Satisfaction subscale* (BASS). This scale aims to assess the level of body satisfaction. The scale consists of nine items listing body areas, muscular development, body mass and overall appearance. Participants rated each item using a 5 response options that ranged from 1 to 5. Lower scores indicated lower satisfaction with body areas (Cronbach α=0.76). The questionnaire was obtained from the instrument owner T. F. Cash via the database www.body-images.com. The Lithuanian version of the questionnaire was validated in the study of Miškinytė and Bagdonas (2010).

Body dissatisfaction was assessed by means of the question "Are you satisfied with your body in general?" with response options ranging from "entirely satisfied" (1 point) to "entirely dissatisfied" (5 points). Higher scores show a higher level of body satisfaction. Subjects who selected the response options "dissatisfied" (4 points) and "entirely dissatisfied" (5 points) were classified as "body dissatisfied".

Drive for muscularity was assessed by means of Drive for muscularity scale (DMS) (McCreary, Sasse, 2000), consisting 15 statements. This scale represents an individual's perception that he/she is not muscular enough and that bulk should be added to his/her body frame, in the form of muscle mass. Likert items were evaluated in the range from "always" (5 points) to "never" (0 points). Higher scores represent a bigger drive for muscularity. The scale with all valued items can be used both for boys and girls (Cronbach α=0.92). A Muscle Development Behaviours subscale, consisting of 8 statements illustrating the drive for muscularity behaviour, was additionally used for boys only in the first survey (Cronbach α=0.90).

Risk of eating disorders (RDE) was assessed by means of *Eating*

*Attitude Test (*EAT-26, Garner et al., 1982). The EAT is a 26-item scale, measuring cognitions, emotions, and behaviours associated with anorexia and bulimia nervosa. Participants rated each item using a 6-point scale that ranges from 0 (never, rarely, sometimes) to 3 (always). Higher scores reflect stronger disordered eating attitudes. Subjects who scored above a cut-off score of 20 may have been at risk of eating disorders (Cronbach α=0.90).

Unhealthy weight loss behaviour (UWLB) and *unhealthy exercising behaviour (UEB)* was analysed using the instrument specially designed for this study. For assessing UWLB the teenagers were asked "If you are aiming to lose or maintain your body weight, which of the following practices have you had?" There were 9 practices with unhealthy body mass control, such as "I skip my meals (breakfast, dinner or supper)", "I use laxatives or diet-pills" etc. UEB scale comprised six practices reflecting the dominating fallacies related to physical activity in aiming to control body mass. The individual responses "strongly disagree" (1) through "strongly agree" (3) were provided in the Likert-type scale. The higher scores reflect more common unhealthy exercising behaviour. The scale internal consistency was positive in this sample, respectively, Cronbach α=0.85 and Cronbach α =0.79.

Subjects, who selected the response option "agree" for at least one of the listed unhealthy weight loss or exercising behaviours for weight control were classified as "practice UWLB" and "practice UEB".

Harmful habits were assessed by means of questions about smoking, alcohol and drug abuse and abusing frequency from WHO coordinated international Health Behaviour in School-aged Children (HBSC) study (Currie et al., 2002; Zaborskis, Vareikiene, 2008). For instance, a question "Have you consumed alcohol over the last three months?" was given with response options from "never" to "every day". Subjects, who admitted consuming at least one of the following alcoholic drinks: beer, wine or vodka, and other drinks several times per week or more often, were classified as "drink alcohol". Smoking habit was assessed by means of the question "How many cigarettes per day do you smoke?" with 10 response options ranging from "I do not smoke" to "3–4 packages a day". Subjects who admitted smoking several times

a week or more often were classified as “Smoking”. Subjects who admitted taking weed, cannabis, marijuana, breathing glue, solvents or using other drugs were classified as “using drugs”.

Physical activity (PA) was assessed by means of questions from WHO coordinated international HBSC study: “Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?” and “Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?” with response options ranging from “not a single day” to “seven days a week”. According to the norms recommended by WHO (WHO, 2010) teenagers should be physically active at least one hour per day, however only 30 teenagers (3.7 per cent) in our survey met the recommendations. Therefore, in our survey we regarded physical activity as sufficient if subjects were physically active five or more days a week (Petronytė, Zaborskis, 2009).

Exercising patterns were assessed by asking what sports or types of physical activity the subjects do and how often. Vigorous exercising for athletic results was assessed by means of the question “Do you train for athletic results and what sport?” Physical activity for recreation and leisure was assessed by the question “Do you exercise for recreation and leisure?” with response options: “No” and “Yes. If yes, please specify the type of sport or physical activity”.

Self-esteem was assessed by means of Rosenberg’s Self-esteem scale (Rosenberg, 1989) containing 10 statements with 4 response options ranging from “agree strongly” (4) to “disagree strongly” (1). Higher scores show higher self-esteem (Cronbach α=0.75). The Lithuanian version of the questionnaire is used for WHO coordinated international HBSC study (Currie et al., 2002).

Self-rated health was assessed by means of the question: “How do you rate your health?” with response options from “poor” (1) to “excellent” (4). Higher scores indicate better health self-rating. The question is taken from WHO coordinated international HBSC study (Zaborskis, Vareikienė, 2008).

Body mass index (BMI) (weight (kg)/height $(m)^2$) was calculated using values of weight and height indicated by the subject. The subjects were

grouped into three groups according to WHO (Flegal et al., 2005) recommendations. The mean BMI of the sample is 20.77 (2.62) kg/m².

Methods of the second survey. In the second survey we used an educational experiment and interviewing in writing. The students were asked to fill in a specially designed for this survey questionnaire consisting of different scales and demographic questions. In addition to the survey instruments described below, disordered eating and self-esteem questionnaires, described in the methods of the first survey, were also used.

Drive for thinness was assessed by means of *Eating Disorder Inventory-3* (EDI-3; Garner, 2004) Drive for thinness subscale. It consists of 7 Likert items with response options ranging from "always" (0 or 4 points) to "never" (0 or 4 points) (Cronbach α=0.88). *Body image dissatisfaction* was assessed by means of the same inventory's *Body Dissatisfaction Scale*, consisting of 10 Likert items with response options described above (Cronbach α=0.87).

Muscle size satisfaction was assessed by means of Drive for Muscularity Scale (DMS) (McCreary, Sasse, 2000) Muscularity-Oriented Body Image Attitudes subscale, consisting of 7 Likert items with response options ranging from "always" (6) to "never" (1). Higher scoring reflects higher satisfaction with muscle size. Following the authors' recommendations, this scale was used for boys only (Cronbach α=0.75).

Exercising frequency was assessed by means of Leisure Time Exercise Questionnaire (LTEQ) (Godin, Shephard, 1985). The respondents were asked to specify low, moderate and vigorous intensity exercising by times per week, if the subject exercised more than 15 minutes. These times were equalled to metabolic equivalents (3, 5 and 9 respectively) and scores of all intensity levels were summed up afterwards.

Knowledge about exercising behaviour for weight control was assessed by means of a specially designed instrument consisting of five statements representing the most common false beliefs about physical activity to control body weight. Statement examples: "Very intensive exercising helps to lose weight" or "Excessive sweating helps to lose weight". These Likert-items had to be evaluated by the level of agreement from 1 (entirely disagree) to 5

(entirely agree). Higher scores show poorer knowledge about exercising behaviour for weight control (Cronbach α=0.89).

Body mass index (BMI) was calculated from the extracts from health records. According to international recommendations by Cole, Bellizzi, Flegal and Dietz (2000), boys with BMI ≥ 23.29 kg/m² and girls with BMI ≥ 23.94 kg/m² were classified as overweight or obese.

Statistical analysis was done using the Statistical Package for Social Sciences (SPSS, version 20.0). The structure of inventories subscales was tested through the exploratory factor analysis. The internal consistency of the scales and questionnaires was evaluated at Cronbach α level. The results were expressed as a mean value (*M*). Chi-square tests examined categorical frequencies. Value differences in two independent groups were found by means of Mann-Whitney U test, and differences between values in more than two groups were found through Kruskal-Wallis H test. Differences between values in two related samples were found through Wilcoxon Signed Rank Test. Correlation between variable was found by means of Spearman's rank correlation coefficient. Differences with categorical variables were analyzed by means of χ^2 (Chi-square test) criterion. The relation of dependent variables and independent variables was analyzed through logistic regression by calculating the confidence interval (OR). The results were considered significant if 1 was outside the confidence interval. The differences were valued as statistically significant, if $p<0.05$ (CI 95%).

2. RESULTS

2.1. Adolescents' body image and related factors in terms of gender, body mass index, physical activity and body satisfaction

The survey results were first of all analyzed in terms of gender. Reliable differences were found between almost all variables (Table 1). Mann-Whitney U test revealed significant variable differences between girls and boys. BMI was much higher in boys than in girls ($p<0.001$). As expected, the drive for muscularity ($p<0.001$) was much more expressed in boys than in girls. Boys were more satisfied with their body image ($p<0.001$) and rated their health better ($p<0.001$). Risk of eating disorders was significantly higher among girls ($p<0.001$). The survey revealed that incidents of unhealthy weight loss behaviour were significantly higher among girls ($p<0.001$), whereas unhealthy exercising behaviour was more common among boys ($p<0.001$). No significant differences between girls and boys were observed in terms of physical activity and self-esteem.

Later we analysed variables in different groups of BMI. According to Kruskal-Wallis H test, overweight subjects, more than teenagers with normal or too low BMI, had a stronger drive for muscularity ($p<0.01$), more expressed unhealthy weight loss behaviour ($p<0.001$) and unhealthy exercising behaviour ($p<0.01$) and significantly higher risk of disordered eating ($p<0.05$) (Table 2). Underweight teenagers ($p<0.001$) assessed their body image best of all, whereas health self-rating was the best among teenagers with normal BMI ($p<0.001$). There was no difference between groups by BMI in terms of physical activity and self-esteem ($p>0.05$).

Table 1. **Variable values in groups of boys and girls**

Variables[1]	Boys N=329	Girls N=476	*U*	*p*
	M	M		
Age (year)	17.29	17.26	*77580*	*0.637*
Body mass index (kg/m²)	21.56	20.22	*66542*	*0.001*
Physical activity (d/week)	3.60	3.19	*50025*	*0.004*
Risk of eating disorders	5.60	8.74	*57368*	*0.001*
UWLB	1.55	3.00	*53559*	*0.001*
UEB	2.62	2.16	*73233*	*0.421*
Drive for muscularity	27.57	9.99	*22612*	*0.001*
BASS	3.57	3.39	*62423*	*0.001*
Self-rated health	3.13	3.04	*69586*	*0.001*
Self-esteem	28.83	28.87	*78589*	*0.994*

Note. [1]The units of measurement are scores unless specified otherwise; UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; BASS – Body Areas Satisfaction Subscale.

Table 2. **Variable values in groups by BMI**

Variables	Body mass index			*H*	*p*
	Underweight	Normal	Overweight		
	17.5 %	75.5 %	7 %		
	M	M	M		
Physical activity	3.38	3.38	3.15	*1.04*	*0.594*
Risk of eating disorders	5.89	7.47	11.22	*8.9*	*0.012*
UWLB	1.75	2.30	4.52	*13.58*	*0.001*
UEB	1.59	2.35	3.28	*13.48*	*0.001*
Drive for muscularity	13.91	17.63	20.62	*10.37*	*0.006*
BASS	3.55	3.48	3.05	*20.11*	*0.001*
Self-rated health	3.02	3.11	2.81	*15.49*	*0.001*
Self-esteem	29.00	28.89	28.04	*1.82*	*0.403*

Note. UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; BASS – Body Areas Satisfaction Subscale.

The survey revealed that physical activity is insufficient in the majority of teenagers (74.7 %). Mann-Whitney U test showed that physically inactive teenagers more often used unhealthy weight loss behaviour ($p<0.001$) and had higher risk of eating disorders ($p<0.05$) compared to physically active teenagers (Table 3). Sufficiently physically active teenagers had a higher self-esteem ($p<0.05$), better body image ($p<0.001$) and self-rated health ($p<0.001$); however they had a stronger drive for muscularity ($p<0.05$) and unhealthy with weight control related exercising behaviour ($p<0.001$).

Table 3. **Variable values in different physical activity groups in the total sample**

Variables	Insufficient physical activity	Sufficient physical activity	*U*	*p*
	74.7 %	25.3 %		
	M	M		
Risk of eating disorders	7.66	6.07	*47138*	*0.020*
UWLB	2.63	1.86	*44433*	*0.001*
UEB	2.08	3.10	*43821*	*0.001*
Drive for muscularity	16.26	20.50	*43305*	*0.007*
BASS	3.39	3.67	*38843*	*0.001*
Self-rated health	3.04	3.20	*46676*	*0.001*
Self-esteem	28.46	29.79	*46452*	*0.003*

Note. UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; BASS – Body Areas Satisfaction Subscale.

We also analyzed the distribution of variables in groups by athletic status. Kruskal-Wallis H test revealed that teenagers doing sports compared with moderately exercising or sedentary peers had higher BMI ($p<0.05$) and bigger drive for muscularity, better self-esteem, better body image and self-rated health ($p<0.001$) (Table 4). On the other hand, teenagers striving for athletic proficiency had poorer with weight control related exercising behaviours ($p<0.001$). Unhealthy weight control behaviour and risk of eating disorders were not related with athletic goals ($p>0.05$).

Table 4. **Variable values in groups of different exercising intensity**

Variables	Do not exercise	Exercise for recreation	Do sports	*H*	*p*
	41.3 %	30.2 %	28.6 %		
	M	M	M		
Body mass index	20.56	20.84	21.00	*6.42*	*0.040*
UWLB	2.41	2.57	2.28	*3.15*	*0.207*
UEB	1.58	2.62	3.20	*42.30*	*0.001*
Risk of eating disorders	7.48	7.90	6.81	*1.37*	*0.505*
Drive for muscularity	13.33	18.47	21.60	*45.08*	*0.001*
BASS	3.33	3.49	3.62	*26.33*	*0.001*
Self-rated health	3.01	3.06	3.19	*20.74*	*0.001*
Self-esteem	28.39	28.71	29.66	*13.78*	*0.001*

Note. UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; BASS – Body Areas Satisfaction Subscale.

According to the results 141 (17.4 %) subjects expressed dissatisfaction with their body areas. More girls were dissatisfied with their body than boys, 21.9 % and 10.9 % respectively (χ^2=16.50; df=1, p=0.001).

The survey has shown that teenagers dissatisfied with their body have higher BMI (p<0.001), they are exposed to higher risk of eating disorders (p<0.001), demonstrated more vivid unhealthy weight control behaviour (p<0.001) and unhealthy exercising behaviour (p<0.001) (Table 5). It was found that teenagers satisfied with their body were more physically active (p<0.05), had higher self-esteem (p<0.001) and better health self-rating (p<0.001).

Table 5. **Variable values in groups of teenagers satisfied and dissatisfied with their body image**

Variables	Body satisfied	Body dissatisfied	*U*	*p*
	82.6 %	17.4 %		
	M	M		
Body mass index	20.49	22.08	*32392*	*0.001*
Physical activity	3.45	2.94	*38000*	*0.002*
Risk of eating disorders	5.84	14.86	*23885*	*0.001*
UWLB	1.97	4.55	*28320*	*0.001*
UEB	2.23	2.94	*37051*	*0.001*
Drive for muscularity	17.38	16.68	*41640*	*0.524*
BASS	3.62	2.74	*12337*	*0.001*
Self-rated health	3.12	2.90	*3878*	*0.001*
Self-esteem	29.19	27.19	*34311*	*0.001*

Note. UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; BASS – Body Areas Satisfaction Subscale.

2.2. Internalization of sociocultural ideals towards appearance in teenagers and its relation with body dissatisfaction, lifestyle factors and unhealthy weight control behaviour

Table 6 illustrates the means of four subscales of SATAQ–3–L questionnaire in different groups of subjects. Man-Whitney U test revealed significantly higher values for girls in all subscales of this questionnaire ($p<0.001$), except for ideal of athletic appearance internalization subscale, where no significant differences between genders were observed ($p>0.05$). Teenagers with too high BMI scored higher in all subscales but, according to Kruskal-Wallis H test, significant differences were observed only in the pressure to meet the ideals, where pressure to meet appearance ideals was more observed in subjects with too high BMI and too low BMI ($p<0.001$). The

results revealed that body dissatisfaction is closely related with social environment. Teenagers dissatisfied with their body areas scored higher in all internalization of sociocultural ideals towards appearance subscales.

It was also found that insufficiently physically active teenagers had more significant internalization of ideals towards appearance ($p<0.05$) and felt pressure to meet the ideals ($p<0.05$), whereas sufficiently physically active teenagers had higher scores in the scale of internalization of ideals towards athletic appearance ($p<0.05$). Internalization of ideals towards athletic appearance was the most significant among the subjects going for competitive sports ($p<0.001$). No significant differences were observed among groups of different physical activities but the biggest pressure to meet the ideals was observed in teenagers doing aerobic activities in leisure time ($H=13.36$; $p=0.01$) (Table 6).

It was found that internalization of ideals towards appearance correlates with unhealthy weight loss and related exercising behaviour. Subjects who often fell into unhealthy behaviour groups showed significantly higher internalization of ideals towards appearance in all four subscales (Table 7). Students going on diets and students falling into disordered eating risk groups had a significantly higher internalization of ideals towards appearance in these subscales. Harmful habits also correlated with internalization of ideals towards appearance. Smoking and alcohol drinking teenagers more often acknowledged pressure to meet appearance ideals ($p<0.05$). Compared to non-drinking teenagers, alcohol drinking peers expressed higher internalization of ideals towards appearance ($p<0.05$), felt more pressure to meet the ideals ($p<0.05$) and were more open to information about the ideal appearance ($p<0.05$). Drug abuse did not correlate with internalization of ideals towards appearance ($p>0.05$).

Table 6. **Expression of sociocultural attitudes towards appearance (SATAQ) by gender, BMI, body satisfaction and different physical activities**

Subject groups	General internalization	Athletes internalization	Pressure	Information
	M	M	M	M
Boys	2.55	2.85	2.22	2.63
Girls	2.93	2.80	2.53	2.83
	U=50847; p=0.001	*U=68798; p=0.143*	*U=58100; p=0.001*	*U=61669; p=0.001*
BMI				
underweight	2.67	2.67	2.17	2.71
normal	2.66	2.82	2.27	2.68
overweight	2.92	2.92	2.70	2.92
	H=2.49; p=0.289	*H=4.79; p=0.091*	*H=13.3; p=0.001*	*H=3.94; p=0.747*
Body dissatisfied	3.26	3.05	2.85	2.85
Body satisfied	2.55	2.75	2.17	2.66
	U=25729; p=0.001	*U=36092; p=0.001*	*U=25159; p=0.001*	*U=39150; p=0.012*
Insufficient PA	2.73	2.74	2.34	2.72
Sufficient PA	2.51	2.97	2.15	2.63
	U=42962; p=0.004	*U=42666; p=0.002*	*U=44382; p=0.004*	*U=48518; p=0.14*
Athletic condition				
Do not exercise	2.60	2.58	2.29	2.68
Leisure time PA	2.74	2.93	2.33	2.71
Competitive sport	2.72	2.99	2.24	2.72
	H=4.46; p=0.107	*H=38.27; p=0.001*	*H=1.58; p=0.453*	*H=0.78; p=0.68*

Note. PA – physical activity.

Table 7. **Expression of sociocultural attitudes towards appearance (SATAQ) in groups of unhealthy weigh control behaviour and harmful habits**

Groups of subjects	General internalization	Athletes internalization	Pressure	Information
	M	M	M	M
Practice UWLB (38.2 %) Do not practice UWLB (61.8%)	2.96 2.50	2.95 2.71	2.63 2.07	2.89 2.58
	U=51195; p=0.001	*U=59015; p=0.001*	*U=44480; p=0.001*	*U=53626; p=0.001*
Practice UEB (46 %.) Do not practice UEB (54 %)	2.75 2.62	2.98 2.66	2.46 2.15	2.78 2.63
	U=66755; p=0.039	*U=58155; p=0.001*	*U=59052; p=0.001*	*U=66180; p=0.002*
Diet (63.3%) No diet (36.7%)	3.10 2.43	3.00 2.68	2.67 2.06	2.94 2.55
	U=40898; p=0.001	*U=54850; p=0.001*	*U=41183; p=0.001*	*U=49660; p=0.001*
Risk of ED (≥20) (10.8 %) No risk (89.2 %)	3.33 2.59	3.28 2.74	2.94 2.20	3.15 2.64
	U=16642; p=0.001	*U=19195; p=0.001*	*U=15224; p=0.001*	*U=85952; p=0.001*
Smoke (39.8 %) Do not smoke (60.2 %)	2.69 2.67	2.82 2.79	2.37 2.24	2.73 2.67
	U=71409; p=0.810	*U=69469; p=0.422*	*U=68282; p=0.047*	*U=71213; p=0.294*
Drink alcohol (80.5 %) Do not drink (19.5 %)	2.71 2.51	2.82 2.74	2.32 2.19	2.73 2.58
	U=40617; p=0.02	*U=44796; p=0.287*	*U=44402; p=0.05*	*U=43342; p=0.028*
Abuse drugs (15.3 %) Do not abuse (84.7%)	2.61 2.69	2.79 2.81	2.34 2.29	2.76 2.69
	U=35482; p=0.277	*U=37510; p=0.774*	*U=37785; p=0.478*	*U=37622; p=0.449*

Note. UWLB – unhealthy weight loss behaviour; UEB – unhealthy exercising behaviour; ED – eating disorders.

Correlation analysis was used to find out the interrelation of variables (Table 8). Internalization of ideal appearance and pressure to meet these ideals directly correlated with BMI ($p<0.01$), unhealthy weight loss ($p<0.01$) and exercising behaviour ($p<0.05$), risk of eating disorders ($p<0.01$) and were inversely related to image ($p<0.01$) and health rating ($p<0.01$), however they were not related with the drive for muscularity ($p>0.05$). Besides, the pressure to meet image expectations inversely correlated with self-esteem ($p<0.05$), physical activity ($p<0.05$). Internalization of ideal athletic appearance directly correlated with BMI ($p<0.01$) and physical activity ($p<0.01$), drive for muscularity ($p<0.01$), weight loss behaviour ($p<0.01$) and exercising behaviour ($p<0.01$) as well as the risk of eating disorders ($p<0.01$). Internalization of ideals towards appearance directly correlated with unhealthy weight loss ($p<0.01$) and exercising behaviour ($p<0.01$), risk of eating disorders ($p<0.01$) and lower body satisfaction ($p<0.01$). Higher drive for muscularity directly correlated with higher BMI ($p<0.01$) and physical activity ($p<0.01$) as well as internalization of ideal athletic appearance ($p<0.01$). It was also directly related with unhealthy exercising behaviour ($p<0.01$) and indirectly related with unhealthy weight loss behaviour ($p<0.05$).

Risk of eating disorders directly correlated with higher values of internalization of ideals towards appearance of all subscales ($p<0.01$), unhealthy weight loss ($p<0.01$) and exercising behaviour ($p<0.01$); however it inversely correlated with physical activity ($p<0.01$), body satisfaction ($p<0.01$) and health rating ($p<0.01$) (Table 8).

Table 8. **Correlations (Spearman's correlation coefficients) in the total sample**

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. BMI	-											
2. PA	.06	-										
3. GI	.14	-.08*	-									
4. AI	.10**	.12**	.51**	-								
5. PP	.12**	-.09*	.58**	.42**	-							
6. INFO	-.01	-.04	.55**	.44**	.46**	-						
7. DM	.18**	.13**	.06	.22**	-.03	-.02	-					
8. UWLB	.17**	-.11**	.28**	.16**	.35**	.25**	-.07*	-				
9. UEB	.21**	.16**	.09*	.18**	.21**	.12**	.20**	.41**	-			
10. RED	.04	-.09**	.31**	.22**	.33**	.24**	.42	.48**	.30**	-		
11. BASS	-.13**	-.21**	-.70**	-.06	-.26**	-.10**	-.01	-.32**	-.09**	-.27**	-	
13. SE	.01	.16**	-.03	.01	-.08*	-.04	-.02	-.13**	.02	-.03	.29**	-

* $p<0.05$; **$p<0.01$.

Note. BMI – body mass index (kg/m²), PA – physical activity, GI – Internalization General, IA – Internalization-Athlete, PP– Pressure, INFO – Information subscales, DM – drive for muscularity, UWLB – unhealthy weight loss behaviour, UEB – unhealthy exercising behaviour, RED – risk of eating disorders, BASS – Body Areas Satisfaction subscale, SE – self-esteem.

2.3. Unhealthy body weight control behaviour in groups by gender and physical activity

The survey helped to find out students' understanding of weight control along with the desired ideal weight. The results have revealed that quite a big number of students are positive about unhealthy weight loss behaviour. The comparison of unhealthy weight loss behaviour between girls and boys showed that skipped meals, fasting and diets are more common among girls ($p<0.001$). Appetite suppressants (pills, beverages) are also more popular among females ($p<0.05$). Wrong understanding about exercising intensity was more expressed among boys; however a significant difference was observed only among boys who found several long training sessions per day acceptable ($p<0.01$) (Table 9).

Table 9. **Expression of unhealthy weight control behaviour in gender groups (%)**

Unhealthy behaviour related with weight loss	Total N (%)	Boys	Girls	Level of significance
Unhealthy weight loss behaviour (38.2 %)				
Skip meals	181 (22.5)	8.8	32.1	$\chi^2=60.32$; $p=0.001$
Fast	101 (12.6)	5.8	17.4	$\chi^2=23.77$; $p=0.001$
Low calorie diet (< 800 kcal)	78 (9.7)	4	13.8	$\chi^2=21.16$; $p=0.001$
One product diet	58 (7.2)	3.3	10	$\chi^2=12.63$; $p=0.001$
Increase cigarettes smoked	68 (8.4)	10.3	7	$\chi^2=2.83$; $p=0.093$
Purge	39 (4.8)	4.3	5.3	$\chi^2=0.45$; $p=0.501$
Use diet pills	38 (4.7)	2.7	6.1	$\chi^2=4.98$; $p=0.026$
Use diuretics	35 (4.3)	3.6	4.7	$\chi^2=0.49$; $p=0.484$
Vomit after meal	26 (3.2)	2.4	3.6	$\chi^2=0.88$; $p=0.349$
Unhealthy exercising behaviour (46 %)				
Exercising longer than 2 hours	156 (19.5)	22.7	17.5	$\chi^2=3.26$; $p=0.071$
Participating in more than one training session in series	97 (12.2)	13.8	10.9	$\chi^2=1.5$; $p=0.21$
Exercising several times per day more than 2 hours	95 (11.9)	15.4	9.4	$\chi^2=6.57$; $p=0.01$
Wearing impermeable warm clothes for bigger sweating	69 (8.6)	8.9	8.3	$\chi^2=0.83$; $p=0.77$
Trying to exercise in the highest intensity of HR	68 (8.5)	9.8	7.7	$\chi^2=1.16$; $p=0.283$
Avoiding drinking fluids during workouts	39 (4.9)	6.5	3.8	$\chi^2=2.86$; $p=0.091$

The survey revealed that adolescent boys demonstrate muscle boosting behaviour (Table 10). We tested the distribution of drive for muscularity behaviour in groups of different athletic condition. We found that different expressions of drive for muscularity behaviour partly depend on the athletic condition. Significantly more young men doing competitive sports than those who do not exercise or exercise only for recreation reasons used muscle mass increasing protein shakes ($p<0.05$), had higher calorie intakes ($p<0.05$). They admitted bad conscious for missing a weight training session ($p<0.05$). The analysis of drive for muscularity behaviour has not revealed significant differences between the groups of different sports and leisure time training.

Table 10. **Muscle development behaviours in groups of different physical activity (%)**

Variables	Total N (%)	Do not exercise	Leisure time physical activity	Participate in competitive sport	Level of significance
I lift weights to build up muscle	307 (95.3)	93.7	97.2	95	*$\chi^2=1.49$; $p=0.475$*
I use protein or energy supplements	36.4 (62.4)	32.6	33.3	45.4	*$\chi^2=4.91$; $p=0.086$*
I drink weight gain or protein shakes	107 (33.2)	27.4	26.9	43.7	*$\chi^2=9.33$; $p=0.009$*
I try to consume as many calories as I can in a day	165 (51.4)	43.2	49.1	60.2	*$\chi^2=6.45$; $p=0.040$*
I feel guilty if I miss a weight training session	206 (64)	44.2	66.7	77.3	*$\chi^2=25.62$; $p=0.001$*
Other people think I work out with weights too often	148 (46)	37.9	48.1	50.4	*$\chi^2=3.65$; $p=0.161$*
I think about taking anabolic steroids	99 (30.7)	25.3	31.5	34.5	*$\chi^2=2.14$; $p=0.344$*
I think that my weight training schedule interferes with other aspects of my life	153 (47.8)	38.3	52.8	50.8	*$\chi^2=4.91$; $p=0.086$*

2.4. Analysis of factors leading to unhealthy weight control outcomes

A 5-step logistic regression analysis was done to find out which of the analysed factors best of all predict the risk of eating disorders and the drive for muscularity. In the prediction of the risk of eating disorders at first we included gender and BMI into the model. We found that female gender significantly increased the risk of eating disorders (3.43 times), whereas BMI increased the risk 1.22 times. After including self-esteem into the model, we found that poor self-esteem increased the risk of eating disorders 1.17 times. In this model gender and BMI remained significant variables (3.63 times and 1.22 times respectively). In the third step, when four SATAQ-3-L subscales were included into the model, female gender, BMI and self-esteem continued increasing the risk of eating disorders (2.22, 1.15 and 1.17 times respectively). Openness to information about ideal appearance increased the risk of eating disorders almost twice (1.83 times) and pressure to meet the ideals increased the risk 1.68 times. In the fourth step, when body dissatisfaction factor was included into the model, we found that gender and BMI lost significance, whereas openness to information about ideal appearance doubled the risk of eating disorders (2.19 times), body dissatisfaction increased the risk 1.64 times and low self-esteem increased the risk 1.15 times. Physical activity was included in the last step. The evaluation of all factors showed that in the total sample the risk of eating disorders could be best predicted from the access to information about ideal appearance (2.10 times), body dissatisfaction (1.61 times), physical inactivity (1.21 times) and poor self-esteem (1.13 times) (Table 11).

Table 11. **Results for hierarchical regression analyses predicting disordered eating in the total sample**

Predictor variable	Disordered eating		
	Nagerkelke R^2	*OR*	*95% CI*
1 step	χ^2=31.23; *df*=2; *p*<0.001		
Gender (girl)	0.08	3.43**	1.91–6.15
Body mass index		1.22**	1.12–1.33
2 step	χ^2=59.30; *df*=3; *p*<0.001		
Gender (girl)	0.16	3.63**	1.99–6.65
Body mass index		1.22**	1.12–1.33
Low self-esteem		1.17**	1.10–1.24
3 step	χ^2=115.14; *df*=7; *p*<0.001		
Gender (girl)	0.30	2.22*	1.13–4.35
Body mass index		1.15**	1.01–1.27
Low self-esteem		1.17**	1.10–1.25
General internalization		1.22	0.78–1.91
Information		1.83*	1.11–3.03
Pressure		1.68*	1.12–2.53
Athletic internalization		1.37	0.90–2.07
4 step	χ^2=126.11; *df*=8; *p*<0.001		
Gender (girl)	0.32	1.94	0.99–3.81
Body mass index		1.08	0.97–1.20
Low self-esteem		1.15**	1.07–1.23
General internalization		1.07	0.67–1.68
Information		2.19**	1.29–3.70
Pressure		1.44	0.94–2.21
Athletic internalization		1.40	0.92–2.14
Body dissatisfaction		1.64**	1.22–2.20
5 step	χ^2=131.37; *df*=9; *p*<0.001		
Gender (girl)	0.34	1.83	0.93–3.63
Body mass index		1.08	0.97–1.20
Low self-esteem		1.13**	1.05–1.21
General internalization		1.05	0.66–1.66
Information		2.10**	1.23–3.60
Pressure		1.38	0.90–2.12
Athletic internalization		1.51	0.98–2.34
Body dissatisfaction		1.61**	1.20–2.17
Physical inactivity		1.21*	1.03–1.42

*p<0.05; **p<0.01.

Table 12. **Stepwise logistic regression to predict the drive for muscularity in the total sample**

Independent variables	Drive for Muscularity (above the median 0.857)		
	Nagerkelke R^2	*OR*	*95 % CI*
Step 1	χ^2=238.05; *df*=2; *p*<0.001		
Gender (girl)	0.39	13.70**	9.23–20.34
Body mass index		1.05	0.98–1.13
Step 2	χ^2=238.21; *df*=3; *p*<0.001		
Gender (girl)	0.39	13.73**	9.24–20.39
Body mass index		1.05	0.98–1.13
Low self-esteem		1.01	0.97–1.05
Step 3	χ^2=258.78; *df*=7; *p*<0.001		
Gender (girl)	0.42	13.96**	9.01–21.65
Body mass index		1.04	0.97–1.13
Low self-esteem		1.01	0.97–1.05
General internalization		1.08	0.80–1.45
Information		0.88	0.63–1.24
Pressure		0.91	0.68–1.23
Athletic internalization		1.69**	1.28–2.22
Step 4	χ^2=265.64; *df*=8; *p*<0.001		
Gender (girl)	0.43	15.71**	9.95–24.81
Body mass index		1.01	0.94–1.10
Low self-esteem		0.99	0.95–1.04
General internalization		1.00	0.74–1.36
Information		0.94	0.66–1.33
Pressure		0.85	0.63–1.16
Athletic internalization		1.70**	1.30–2.24
Body dissatisfaction		1.34*	1.07–1.67
Step 5	χ^2=269.59; *df*=9; *p*<0.001		
Gender (girl)	0.43	15.85**	10.02–25.07
Body mass index		1.01	0.93–1.09
Low self-esteem		1.00	0.96–1.05
General internalization		1.01	0.75–1.37
Information		0.96	0.68–1.36
Pressure		0.87	0.64–1.18
Athletic internalization		1.63**	1.23–2.15
Body dissatisfaction		1.36**	1.09–1.69
Physical inactivity		1.12*	1.01–1.25

*p<0.05, **p<0.001

The same stepwise logistic regression model was used to test the factors that could predict the drive for muscularity. In the drive for muscularity scale we found a more intensive drive from the median (0.857), which we aimed to forecast (Table 12).

The model showed that in the first step masculine gender had the biggest significance for the drive for muscularity in the total sample (13.7 times). When self-esteem was added in the second step, gender remained the sole significant variable predicting the drive for muscularity (13.73 times). When SATAQ-3-L scales were included into the model in the third step, we saw that masculine gender remained the strongest factor predicting the drive for muscularity (13.96 times), followed by the internalization of ideals towards athletic appearance (1.69 times). When body dissatisfaction was included into the model in the fourth step, the significant factors predicting the drive for muscularity were: masculine gender (15.71 times), internalization of ideals towards athletic appearance (1.7 times) and body dissatisfaction (1.34 times). After adding physical activity in the fifth step and considering all predicting factors, we saw that masculine gender was the strongest variable that increased the possibility of the drive for muscularity 15.85 times. Internalization of ideals towards athletic appearance increased this possibility 1.63 times, followed by body dissatisfaction (1.36 times) and more intensive physical activity (1.12 times).

2.5. Analysis of the effect of educational body image optimization program

The analysis of the results of second research (educational experiment) by gender showed significant differences in almost all variables. Girls, compared to boys, had lower BMI ($p<0.01$), lower physical activity ($p<0.001$), higher drive for thinness ($p<0.001$), higher body dissatisfaction ($p<0.001$), lower self-esteem ($p<0.001$) and higher risk of eating disorders ($p<0.05$). There was no big difference between genders in the approach to unhealthy exercising behaviour for weight control ($p>0.05$) (Table 13).

Table 13. **Variable values by gender after the first survey**

Variables	Boys N=191	Girls N=237	*U*	*P*
	M	M		
Body mass index (kg/m²)	20.65	20.05	*20709*	*0.009*
Exercising frequency (MET)	61.55	40.35	*15361*	*0.001*
Drive for thinness	0.62	1.09	*14111*	*0.001*
Body dissatisfaction	0.95	1.49	*14161*	*0.001*
Risk of eating disorders	5.91	7.09	*17917*	*0.001*
UEB	16.73	16.19	*19225*	*0.068*
Self-esteem	31.22	28.74	*15301*	*0.001*
Satisfaction with muscularity (only for boys)	3.40	-	-	-

Note. UEB – attitude towards unhealthy exercise behaviour.

Initial indicators of experimental and control groups before the educational program were compared for the evaluation of health education program effectiveness. We found that control group had higher risk of eating disorders ($p<0.01$), and there were no significant differences in the other indicators (Table 14). The comparison of group indicators after health education program revealed certain significant changes after the program: the experimental group differed from the control group in drive for thinness ($p<0.05$), body dissatisfaction ($p<0.05$) and self-esteem ($p<0.05$).

Table 14. **Variable values in experimental and control group before and after health education program**

	Before experiment		*U*	*p*	After experiment		*U*	*p*
	E1 group N=237	C1 group N=211			E2 group N=237	C2 group N=211		
	M	M			M	M		
Body mass index(kg/m²)	20.07	20.46	*22882*	*0.24*	20.14	20.52	*22841*	*0.20*
Exercising frequency	50.62	48.81	*24633*	*0.79*	50.48	48.31	*24440*	*0.68*
Drive for thinness	0.83	0.95	*18144*	*0.08*	0.81	1.06	*17142*	*0.003*
Body dissatisfaction	1.21	1.31	*19022*	*0.23*	1.16	1.37	*17018*	*0.02*
UEB	16.36	16.50	*20945*	*0.57*	16.06	16.75	*20791*	*0.08*
Risk of eating disorders	5.61	7.64	*21630*	*0.01*	6.62	7.56	*22667*	*0.09*
Self-esteem	30.23	29.37	*20069*	*0.07*	30.93	29.85	*19284*	*0.02*
Satisfaction with muscle mass	3.27	3.51	*4279*	*0.12*	3.37	3.41	*4627*	*0.71*

Note. E1 – experimental group before educational program; E2 – experimental group after educational program; C1 – control group before educational program; C2 – control group after educational program; UEB – attitude towards unhealthy exercise behaviour.

We also analyzed the effect of the educational program on the experimental and control groups separately. To evaluate the effect we used non-parametric statistical hypothesis test by comparing two paired samples and calculating Wilcoxon Z ratio. We found, that health education program had a significant effect only for the self-esteem of teenagers in experimental group; their self-esteem improved (Wilcoxon Z ratio =-3.42; p=0.001), whereas no statistically significant changes were observed in other measures. As expected, none of the analyzed variables changed significantly in the control group (Table 15).

Table 15. **Variable values in experimental and control group separately before and after health education program**

	Experimental group N=237		*Z*	*p*	Control group N=211		*Z*	*p*
	E1 group	E2 group			C1 group	C2 group		
	M	M			M	M		
Body mass index (kg/m²)	20.15	20.20	*-1.23*	*0.22*	20.49	20.58	*-0.92*	*0.36*
Exercising frequency	50.62	50.48	*-0.58*	*0.56*	48.81	48.31	*-0.57*	*0.57*
Drive for thinness	0.83	0.81	*-1.39*	*0.17*	0.95	1.06	*-0.11*	*0.92*
Body dissatisfaction	1.21	1.16	*-0.27*	*0.79*	1.31	1.37	*-0.25*	*0.80*
UEB	16.36	16.06	*-1.43*	*0.15*	16.50	16.75	*-0.23*	*0.82*
Risk of eating disorders	5.61	6.62	*-1.10*	*0.27*	7.64	7.56	*-0.85*	*0.39*
Self-esteem	30.23	30.93	*-3.42*	*0.001*	29.37	29.85	*-1.32*	*0.19*
Satisfaction with muscle mass	3.27	3.37	*-0.11*	*0.92*	3.51	3.41	*-2.02*	*0.06*

**p<0.001.

Note. E1 – experimental group before educational program; E2 – experimental group after educational program; C1 – control group before educational program; C2 – control group after educational program; UEB – attitude towards unhealthy exercise behaviour.

CONCLUSIONS

1. Body image is a problematic issue among teenagers. Body image dissatisfaction is more common among adolescent girls and teenagers with higher body mass index and lower physical activity.

Adolescent girls have a more negative body image; they are more likely to use unhealthy weight control behaviours (and risk of eating disorders) and are less physically active, whereas adolescent boys have a higher drive for muscularity and related behaviours.

Underweight teenagers have the best body image. Overweight teenagers most often use unhealthy weight control behaviours, they smoke more often, however their physical activity does not differ from their peers with normal body mass index.

Physically active teenagers have better body image, use unhealthy weight control behaviours less frequently but have a higher drive for muscularity.

2. Adolescent girls more than boys internalize sociocultural ideals towards appearance. Less physically active and overweight teenagers experience a higher pressure to meet appearance ideals. Internalization of sociocultural ideals towards appearance among teenagers is related to higher body dissatisfaction, more frequent unhealthy weight control behaviour, lower physical activity and more frequent alcohol abuse. The perceived pressure to meet appearance ideals is related to lower self-esteem, more frequent unhealthy weight control behaviour and smoking. Internalization of athletic ideal is related to a higher drive for muscularity.

3. Unhealthy weight control behaviour (risk of eating disorders) can be best predicted from the access to information about the ideal appearance, body dissatisfaction, low self-esteem and insufficient physical activity irrespective of body mass index. The drive for muscularity among teenagers is mostly predicted by male gender, athletic ideal internalization, body dissatisfaction and lack of physical activity.

4. The educational program developed on the basis of cognitive dissonance strategy and aimed for raising self-esteem and improving media literacy had a positive effect on adolescent self-esteem, but it did not have a significant effect on the changes in body image, drive for thinness, risk of eating disorders, body weight control and physical activity literacy. The program content and implementation measures should be corrected by conducting further research.

SUMMARY IN LITHUANIAN

Socialinė erdvė yra svarbus kūno vaizdo formavimosi komponentas, susijęs su savo kūno suvokimu (Jackson, 2004). Kuo labiau asmens fiziniai bruožai nutolę nuo socialinių lūkesčių, tuo labiau asmuo nepatenkintas savo kūnu, tuo prasčiau save vertina, dažniau linksta į depresiją, dažniau manipuliuoja maistu (Cash, Pruzinsky, 2004; Tiggemann, 2011). Rūpestis dėl nepasitenkinimo savo kūnu turi neigiamą poveikį paauglių fiziniam bei psichosocialiniam vystymuisi ir sveikatai (Johnson, Wardle, 2005; Shrof, Thompson, 2006). Paauglių tyrimai atskleidžia, kad nepasitenkinimas savo kūnu paauglystėje yra susijęs su prastesniu savęs vertinimu, sutrikusiu valgymo elgesiu, neigiamų svorio kontrolės būdų taikymu ir didėjančiu vaikų bei paauglių antsvorio plitimu (Neumark-Sztainer et al., 2006; Jackson, Chen, 2010). Prastas savęs vertinimas siejamas su dažnesne tikimybe tapti patyčių auka (Jankauskiene et al., 2008), didesne savižudybės rizika, savęs žalojimu (Rodriguez-Cano, Beato-Fernandez, Llario, 2006; Laskytė, 2009).

Iki šiol atliktuose tyrimuose daugiausia dėmesio buvo skiriama su valgymu susijusiam elgesiui analizuoti, o darbų, kurie atskleistų su fiziniu aktyvumu susijusio elgesio raišką reguliuojant kūno masę, stokojama. Nėra iki galo aišku, kiek bendras siekimas atitikti socialinius ir kultūrinius išvaizdos idealus yra susijęs su svorio mažinimo elgesiu, nežinoma, kaip paaugliai elgiasi, jei nusprendžia kūno masę mažinti fiziniu aktyvumu. Trūksta tyrimų, nagrinėjančių paauglių savęs, savo kūno ir savo sveikatos vertinimo sąsajas su lieknumo ir raumeningumo siekimu skirtingo fizinio aktyvumo grupėse ir sporto šakose. Be to, tyrimai, vertinantys nepasitenkinimo savo kūnu ir fizinio aktyvumo sąsajas yra gana prieštaringi – vieni tyrėjai teigia, kad fizinis aktyvumas susijęs su geresniu savo kūno vertinimu (Hausenblas, Fallon, 2006; Campbell, Hausenblas, 2009; Voks et al., 2009), kiti aiškina priešingai (Zabinski et al., 2001; Leone, Sedory, Gray, 2005; McCabe, Ricciardelli, James, 2007).

Suminėti teiginiai pagrindžia tyrimų, atskleidžiančių sąsajas tarp paauglių požiūrio į savo kūną, fizinio aktyvumo ir kūno svorio mažinimo

elgesio bei nepasitenkinimo savo kūnu prevencijos aktualumą. Stinga darbų, kuriuose būtų nagrinėjami šie aspektai tarp abiejų lyčių. Todėl mūsų **tyrimo objektas** yra paauglių požiūris į savo kūną bei edukacinės programos galimybės jį koreguoti.

Tyrimo tikslas – nustatyti paauglių požiūrio į savo kūną ypatumus ir edukacinės programos poveikį šio požiūrio koregavimui.

Tyrimo uždaviniai:

1. Nustatyti požiūrio į savo kūną ir su juo susijusių veiksnių raišką lyties, kūno masės indekso bei fizinio aktyvumo grupėse.

2. Atskleisti požiūrio į savo kūną sąsajas su socialiniais, savęs vertinimo bei sveikatai žalingo kūno masės reguliavimo veiksniais.

3. Nustatyti veiksnius, labiausiai prognozuojančius paauglių sveikatai žalingą kūno masės reguliavimą.

4. Sukurti edukacinę programą ir įvertinti jos poveikį paauglių požiūrio į savo kūną ir su juo susijusių veiksnių bei sveikatos raštingumo kūno masės reguliavimo srityje kaitai.

Darbo naujumas, mokslinė ir praktinė reikšmė. Naujas šio darbo aspektas yra tas, kad požiūrio į savo kūną ir su juo susijusių veiksnių raiškos ypatumai buvo nagrinėjami skirtingo fizinio aktyvumo paauglių grupėse. Ši analizė papildys mokslines žinias, kaip fizinis aktyvumas ir dalyvavimas sportinėje veikloje susijęs su savo kūno vertinimu. Fizinis aktyvumas kaip apsauginis veiksnys mažai buvo tirtas net ir Vakarų šalių tyrėjų.

Kaip vieną disertacinio darbo naujumų reikėtų laikyti tai, kad abiejuose tyrimuose dalyvavo abiejų lyčių paaugliai. Iki šiol visame pasaulyje atlikta vos kelios dešimtys vaikų ir paauglių nepasitenkinimą savo išvaizda mažinančių kontroliuojamų ir mokyklose vykdytų reprezentatyvių sveikatos ugdymo programų efektyvumo tyrimų (O'Dea, 2007). Mūsų šalyje – tai visiškai naujas projektas. Šis tyrimas padės atskleisti, kokį poveikį minima sveikatos ugdymo programa turi vidurinio tarpsnio paauglystėje abiem lytims (daugumoje edukacinių programų buvo tiriami 10–11 metų paaugliai, dažniausiai mergaitės). Šia programa siekta patikrinti, kaip ji veikia berniukus, nes iki šiol

pasaulyje atlikti ir paskelbti vos devyni tyrimai, kuriuose dalyvavo berniukai.

Teoriniu požiūriu darbas yra reikšmingas, nes, be išsamios duomenų analizės, padėjusios atskleisti paauglių požiūrį į savo kūną problematiką ir nustatyti pagrindinius sveikatai žalingos svorio reguliavimo elgesio ypatumus, jis taip pat leido išskirti svarbiausius su šio rizikingo elgesio formavimusi susijusius veiksnius. Gauti tyrimų rezultatai yra svarbūs formuojant paauglių nutukimo, valgymo sutrikimų ir žalingų įpročių vartojimo prevencijos strategijas, taip pat rengiant ir įgyvendinant mokinių sveikatos ugdymo programas. Disertaciniame darbe tyrimo rezultatų pagrindu parengtos praktinės rekomendacijos dėstomos šalies, bendruomenės ir asmens lygmenimis.

IŠVADOS

1. Paauglių požiūris į savo kūną yra problemiškas. Savo kūnu labiau nepatenkintos merginos nei vaikinai, didesnio kūno masės indekso ir nepakankamo fizinio aktyvumo paaugliai.

Merginos prasčiau vertina savo išvaizdą, jos dažniau naudoja sveikatai žalingus kūno masės mažinimo būdus (joms būdingesnė valgymo sutrikimų rizika) ir skiria mažiau laiko fiziniam aktyvumui, o vaikinams būdingesnis raumeningumo siekimas ir su juo susijęs elgesys.

Geriausiai savo išvaizdą vertina per mažo kūno masės indekso paaugliai. Antsvorio turintys paaugliai dažniau imasi sveikatai žalingo kūno masės reguliavimo, dažniau rūko, tačiau jų fizinis aktyvumas nesiskiria nuo normalios kūno masės bendraamžių.

Pakankamo fizinio aktyvumo paaugliai geriau vertina save ir savo išvaizdą, rečiau naudoja sveikatai žalingus kūno masės mažinimo būdus, bet jiems būdinga didesnis raumeningumo siekimas.

2. Merginos labiau negu vaikinai siekia atitikti socialinius išvaizdos lūkesčius. Per mažo fizinio aktyvumo ir antsvorio turintys paaugliai labiau spaudžiami atitikti socialinius išvaizdos lūkesčius. Paauglių siekimas atitikti šiuos lūkesčius yra susijęs su didesniu nepasitenkinimu savo kūnu, dažnesniu sveikatai žalingu kūno masės reguliavimu, mažesniu fiziniu aktyvumu, dažnesniu alkoholio vartojimu. Suvokiamas spaudimas atitikti išvaizdos

lūkesčius susijęs su prastesniu savęs vertinimu, dažnesniu sveikatai žalingu kūno masės reguliavimu ir dažnesniu rūkymu. Sportinio idealo siekimas susijęs su didesniu raumeningumo siekimu.

3. Paauglių sveikatai žalingą kūno masės reguliavimą (valgymo sutrikimų riziką) labiausiai prognozuoja informacijos apie idealią išvaizdą gavimas, nepasitenkinimas savo kūnu, žemas savęs vertinimo lygis ir fizinis pasyvumas nepriklausomai nuo lyties bei kūno masės indekso. Paauglių raumeningumo siekimą labiausiai prognozuoja vyriškoji lytis, siekimas atitikti sportinį išvaizdos idealą, nepasitenkinimas savo kūnu ir fizinis pasyvumas.

4. Kognityvinio disonanso strategija, savęs vertinimo kėlimu bei žiniasklaidos naudojimo priemonių raštingumo didinimu pagrįsta, edukacinė programa turėjo poveikį paauglių savęs vertinimui, tačiau neturėjo reikšmingos įtakos požiūrio į savo kūną, potraukio į liesumą, valgymo sutrikimų rizikos, raštingumo kūno masės kontrolės ir fizinio aktyvumo srityse kaitai. Programos turinys ir įgyvendinimo priemonės turėtų būti koreguojami remiantis tolesniais tyrimais.

Author's contribution. In 2009 Simona Pajaujienė conducted a study with 11th graders in 16 schools of Kaunas: designed a questionnaire, organized the surveys, entered data into electronic media and performed mathematical-statistical analysis of the data. In the second study funded by the Lithuanian Research Council the author contributed to the development of the educational experimental program, trained public health specialists, who delivered the program in schools, contributed to the preparation of questionnaires, teaching material, introduced the study in schools and participated in the surveys.

Simona Pajaujienė wrote (contributed as co-author) 11 scientific publications, introduced results of the study in 10 scientific conferences in Lithuania and abroad (presentations in three conferences awards in sections), gives lectures and practical classes for LSU students of Health and Physical Activity and Training systems (Fitness trainer) study programs. The author is active promoter and organizer of wellness and physical activities, fitness and group fitness trainer.

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