

In: Body Image  
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*Chapter 1*

**GENDER DIFFERENCES IN ADOLESCENTS’  
PERCEPTIONS OF ONE’S OWN BODY,  
EATING HABITS AND SPORTS  
PARTICIPATION MOTIVES IN THE  
ERA OF SEDENTARY BEHAVIOR**

***Janka Peráčková<sup>1</sup> and Pavol Peráček<sup>2</sup>***

<sup>1</sup>Department of Sport Educology and Sport Humanities,  
Faculty of Physical Education and Sport,

Comenius University in Bratislava, Bratislava, Slovak Republic

<sup>2</sup>Department of Sport Games, Faculty of Physical Education and Sport,  
Comenius University in Bratislava, Bratislava, Slovak Republic

**ABSTRACT**

This chapter will present the results among adolescent sports active and sports inactive girls and boys, their perception of their own body image and their associated eating habits and sports participation motives. We used self-reported questionnaires for research. For perceptions of their own body, we used the Figure Rating Scale – FRS (Stunkard, Sorenson and Schulsinger 1983a, 1983b) to find out the attitude towards one’s own body. For investigating eating habits, we used the questionnaire; Eating Attitude

Test – EAT-26 (Garner, Olmsted, Bohr, Paul and Garfinkel 1982) to determine whether some might have an eating disorder and the questionnaire; The Exercise Motivations Inventory – EMI-2 (Markland and Hardy 1993; Markland and Ingledew 1997) was used to assess participation motives in sports. The respondents were girls and boys (n=320) from selected Slovak secondary schools who were divided into sports active and sports inactive. Results about perceptions of one's own body showed that both girls and boys differ in their perceptions of ideal appearance and both sports active and sports inactive also differ in their perceptions of ideal appearance. Most of them are dissatisfied with their perception of their own body. In comparisons of gender and sports participation with perceptions of their own body we found out that the differences in boys and sports active adolescents were statistically smaller than in girls and sports inactive adolescents. Sports participation appears to be a more significant predictor of satisfaction with one's own body than gender. Results about eating habits in comparison to gender showed no statistical differences between adolescent girls and boys as a whole. Statistical differences appear in eating a second dinner, more boys eat a second dinner than girls. In a comparison of eating habits between sports active and sports inactive adolescents, we found more positive eating habits in sports active adolescents. Our research shows the most important motives for participating in sports for boys are; positive health, strength and endurance, physical appearance, enjoyment and fun, nimbleness, weight management, and for girls; positive health, physical appearance, strength and endurance, enjoyment and fun, weight management, nimbleness. For sports active boys, the motives are; strength and endurance, positive health, physical appearance, enjoyment and fun, nimbleness, weight management, and for sports inactive boys positive health, strength and endurance, weight management, nimbleness, physical appearance, enjoyment and fun. For sports active girls, the motives are; positive health, physical appearance, enjoyment and fun, strength and endurance, weight management, nimbleness and for sports inactive girls, they are; positive health, strength and endurance, physical appearance, weight management, nimbleness, enjoyment and fun. Gender and physical activity can be a predictor of satisfaction or dissatisfaction with body size, eating concerns, eating habits and exercise motives.

**Keywords:** body perception, eating habits, adolescents, sport participation motives

## **1. INTRODUCTION**

The best means to maintain good physical and mental health is physical activity, which must be in one's schedule everyday. The body is prepared for movement and the development of modern civilization has eliminated most physical activity from human activities. More and more work activities are losing the character of physical activity and becoming sedentary like computer activities. The use of computers and robots in the work place caused the removal of movement. Sedentary behavior is where people are during most of their waking time – sitting, lying, or sometimes standing without moving and changing positions causes very low energy expenditure. The example of sedentary behavior is typical at school – sitting at the desk in front of blackboard, typical at work – sitting at the table in front of the computer. Nowadays, an employer will not walk into next office because he/she will rather use internal e-mail or mobile phone to manage work tasks. Robots have mastered some operations, which were formerly done by the people. The time spent in work in western civilizations has grown despite declaring a reduction of working time, and leisure time has become a rarity. Leaving work to go home for some, is only changing the place to continue working. With this pattern of living, physicians will have to work with new nameless illnesses because we do not know the results from research, what will happen when there is a long-term deficiency of movement. A sedentary lifestyle is negative for public health and therefore attracts media and research attention.

### **1.1. The Era of Sedentary Behavior**

Surveys from European countries (Cavill, Kahlmeier and Racioppi 2006) showed low levels of overall physical activity in many populations. They said that physical activity has seemed to be disappearing from the lifestyle of people, and the sedentary way of living has begun. In addition, physical activity is one of the keys to counteracting the current epidemic of overweight and obesity that is posing a new global challenge to public health (Danzon 2006). The next European survey from the year 2014 (Santaliestra-

Pasías, Mouratidou, Verbestel et al. 2014) showed that approximately one third of the children (from the amount of  $n=15\ 330$ ) aged 2-10 years were engaged in daily media use of more than 2 hours a day. The availability of a television in a child's personal space has increased the risk of excess time of media use. The American Academy of Pediatrics, the Committee on Public Education (2001) in its statement describes the possible negative health effects of television viewing on children and adolescents. The American Academy of Pediatrics suggested that adolescents should not spend more than two hours per day in screen viewing. They warned that programs in screen viewing equipment could lead to poor body image, obesity, eating disorders, violent and aggressive behavior, substance abuse, inadequate sexual activity and decreased school performance as well.

With sedentary behavior comes the image of (in)activity that a person can sit and view television, can sit and play videogames, can sit and read, can sit and knit or make another handmade activities, can sit and drive the car, can sit and work with the computer, can stand and talk, can lay and read the journals. All activities in sitting, laying or standing position have a very low energy expenditure. Sedentary behavior is defined as;

“any waking behavior characterized by an energy expenditure  $\leq 1.5$  METs while in a sitting, reclining or lying posture” (Tremblay, Aubert, Barnes et al., 2017).

We think that not having enough movement through the whole day begins already in preschool age. The ISCED 0 in Slovakia – state educational program for preschool children (curriculum) has 7 areas of education: language and communication, mathematics and work with information, human being and the nature, human being and the society, human being and the world of work, art and culture, and health and motion. The educational system is focused mostly on the cognitive (informative) side of education rather than on the formative side, where the development of motor abilities and motion of the children are involved. The literature search of Hinkley, Crawford, Salmon et al. (2008) summarized the literature over the past 27 years (1980-2007), which investigated preschool children's physical activity behaviors. They found out that boys were more active than girls, and the next very important result was that children with more active

parents tended to be more active, and the children who spent more time outdoors were more active than children who spent less time outdoors.

The comparison of questionnaire data collection from the years 1994-1995 and the next wave of research in the year 2001 (Gordon-Larsen, Nelson and Popkin 2004) showed that the vast majority of adolescents did not achieve five or more sessions of moderate physical activity per week and continued with this behavior into adulthood. Authors Aarnio, Winter, Peltonen et al. (2002) introduced a longitudinal survey, which declared that those who participated in organized sports were more often persistent exercisers than those who did not, and the stability of leisure-time physical activity was highest among those, who participated in several types of sports. In the publication of Hallal, Andersen, Bull et al. (2012) it is written that 31.3 % of adults worldwide do not meet physical activity recommendations. The recommendation of Cavill, Biddle and Sallis (2001) is that all young people should participate in moderate intensity physical activity for one hour per day or at least half an hour per day for young people who are currently performing little physical activity. The authors' cross-sectional study, Ruiz, Ortega, Martínéz-Goméz et al. (2011) revealed that a higher proportion of European boys (56.8% of boys vs. 27.5% girls) met the physical activity recommendations of at least one hour per day of moderate- to vigorous-intensity physical activity. Adolescents spent 9 hours a day in sedentary behavior.

Insufficient vigorous physical activity was the only risk factor for higher body mass index for adolescent boys and girls (n=878) in the study of Patrick, Norman, Calfas et al. (2004). They found out that few adolescent girls or boys were meeting any of the three dietary recommendations.

Physical activity mostly declines from adolescence to adulthood. The decline in physical activity with age was the research of Sallis, Prochaska and Taylor (2000) in the United States of America, who indicated the steepest decline between the ages of 13 and 18 years old and surprisingly, they found that this decline is greater for male than female subjects. But the most frequent and most consistent findings was that boys are more active than girls (*ibid*). The findings of Nelson, Neumark-Sztainer, Hannan et al. (2006) confirmed the longitudinal decline in moderate to vigorous physical activity (particularly among girls) and at the same time (between years 1999-2004) there was a dramatic increase in computer use (particularly among

boys). The meta-analysis review of Mielke, Brown, Nunes, et al. (2017) investigated the relation of socioeconomic correlates to sedentary behavior in adolescents and found out that the associations between socioeconomic status and sedentary behavior are different in high- and low-middle-income countries. In a longitudinal study of Bauer, Nelson, Boutelle and Neumark-Sztainer (2008), which lasted 5 years, examined how parental concern about staying fit is associated with adolescents' physical activity and sedentary behavior habits. The final statement is that parental encouragement to be physically active was associated with increased this activity among males and younger females. Younger adolescents appear to be especially influenced by their same-sex parent.

The aim of the Kukurová and Peráčková (2016) research was to broaden knowledge about the sports participation of female primary school pupils from Slovakia. Today's lifestyle brings inactivity and moreover a sedentary lifestyle. Physical activity is disappearing out of the daily regime, while everybody knows that physical activity is good for life and the proper functioning of the body. The research sample consisted of 189 female pupils. 90 of them attended primary school in the city and 99 female pupils attended school in the village. The results reveal that 74 female pupils (39.2 %) were organized in sport activities. 40 out of 90 female pupils attending primary school in the city were organized in sports activities, as were 34 out of 99 female pupils from the village. A comparison of the participation of female pupils from the city and from the village brought results without statistical significance. The survey of Peráčková (2010) showed the organized sports participation of the secondary school population from Slovakia. From the research sample taken from over the whole of Slovakia (n= 5300 pupils, girls n=3146 and boys n=2154) only 14.6% of girls were organized in some sports club or extracurricular sporting activities and the other 85.4% were identified as nonathletes. Participation of organized boys from Slovak secondary school in some motion or sports activities was 27.7 %. Most of them who were organized in sporting activities (girls 36.4% and boys 44.1%) were from the first class of secondary school and then we registered a declining trend of participation with the age. In comparison, Peráčková's (1994) survey declares that in that year 1994 more boys than girls were organized in the sports club participation lead by at responsible person – trainer and recreational (spontaneous) physical activities (boys 55.9%, girls 52.6%). Physical activities were preferable among adolescents during

leisure time. Authors of an article (Washington 2001) stated that participation in organized sports provides an opportunity to increase physical activity and to also develop physical and social skills. Participation in organized sports was associated with a greater likelihood to engage in a cluster of health behaviors (Vella, Cliff, Okely et al. 2013).

When there is no physical activity and locomotion, this is the rapid way to health damage and illness. In Finland, there was research of this issue as part of a national-level research program, Cardiovascular Risk in young Finns (Telama and Yang 2000). The aim was to analyze the age-related decline of physical activity among Finnish people of both genders aged 9, 12, 15 and 18 from the year 1980 with follow up measurements in 1983, 1986, and 1989, thus the data covered ages from 9 to 27 years old. They found the decline from the age of 12 years in the frequency of physical activity and sports participation and the same result as Sallis, Prochaska and Taylor (2000) and Sallis (2000) that the decline of physical activity was steeper among male than female subjects. The probable mechanism, according to their thoughts, is due to the dopamine system that regulates motivation for locomotion. The same results, claimed by Ingram (2000);

“reduced dopamine release or loss of dopamine receptors appears to underlie age-related activity decline, and interventions that enhance dopamine function can increase activity levels in aged animals”, because it has biological basis.

Therefore the researchers should investigate the causes of rapidly boosting the sedentary behavior that starts in the age of late puberty and young adolescence.

We investigated the sports participation motives among sports active and sports inactive adolescent boys and girls. The findings will be presented in this chapter. We need to find the gender- and age-related (adolescence) movement interventions for being physically active to maintain a healthful lifestyle with the adequate portion of motion.

The question arises if, there will be free time and a choice for young people, what will they be choosing, sedentary behavior or behavior with physical activity? We feel that most of the people should take a chance for behavior with physical activity. It does not matter if it will be the

consequence of rational behavior based on media recommendation or advertisement or evidence-based scientific advice from research about the positive influence of physical activity for a person's lifestyle. The question of whether sedentary behaviors displace participation in physical activity is vivid in current time but what it will cause is unknown.

## **1.2. Gender Differences in Satisfaction or Dissatisfaction with the Perception of One's Own Body Size**

Perception is a basic cognitive process and it is responsible for our contact with the entire world. Perception is a process which is initiated with the feelings of all sensitive people.

But each individual personality has its own way of perception as it is known in this saying: "Quidquid recipitur, ad modum recipient recipitur" – ("Whatever man received, is received according to the ability of the recipient." or "Whatever one perceives, it perceives it in his/her own way.").

According to Boroš, Ondrišková and Živčicová (1999) perception is composed of three conditions:

- a) The innate state of sensory organs, body build, and its functionality.
- b) Individual way of living that is conditioned with motivation, attitudes, approaches, and interests.
- c) Previous experience and knowledge.

Thanks to these psychological characteristics man can perceive brighter and smarter. Perceiving is dependent from culture in which the man is a part. Perception is joined also with thinking, will and feelings. Perception, feelings and thoughts of individuals towards their own bodies are very important phenomenon in the everyday social life of a man. Perception of one's own physical appearance is important in the development of young people and the development of their self-concept, self-esteem and self-confidence. Quality of life is dependent on the perception of one's own body. During assessment of one's own physical appearance, results come in two attitudes – positive and negative. Positive self-assessment is defined as a satisfaction with the body form, size and appearance and negative attitude

is a dissatisfaction, which can cause a lack of confidence in a social life. In adolescence, body image is very important, especially for girls. Nowadays more adolescent boys are getting worried about their body (Grogan 1998; Bergeron 2007; Petroski, Pelegrini and Glaner 2009; Dejóv 2016). The problem of body image dissatisfaction among adolescent girls and boys is vivid and visible, based on what we see in this chapter and the referenced literature.

Casual dependence between media and negative body image offered a critical analysis (Dittmar 2009) that is based on evidence and highlighted not only differences with respect to individuals, but also how it is linked to personality and self-identity. Identification with the thin ideal as a vulnerability factor, is not only for women but for men too.

The research of authors Andrew, Tiggemann and Clark (2015) found that women who had less respect for their body had an increased degree of dissatisfaction with body image, while for those who respect their own body, the degree remained the same. The impact of exposure to thin-ideal media image from research publication Hawkins, Richards, Granley and Stein (2004) has stated that most women in the media are 15% under the average weight of standard women from the population, and even pointed to the fact that women in commercials and movies have become increasingly slimmer over the last 10 years. According to their findings, the exposure to thin-ideal in media increased body dissatisfaction and eating disorders. Media, parents and peers were three primary core sources of influence in the research of van den Berg, Thompson, Obremski-Brandon and Coover (2002) that contributed to development of body image dissatisfaction and eating disturbances.

### **1.3. Satisfaction or Dissatisfaction with Body Size in Sports Active and Sports Inactive Adolescents**

Physical activity, exercise and sports are considered as a means for increasing a person's level of positive body perception. In the period of adolescence, several factors influenced the life of young people. A great part of these factors concerns body size or body shape, which are common among young women mostly from Western civilizations and their cultures. The girls

are more emotional, and the negative words can hurt and negatively influence the girl's feelings. Adolescents are in a period when they are no longer children, but they are not yet adults. The adolescent period is characteristic with emotional changes and typical social reorientation from the family to peers and romantic interests (Flaxman, Skattebol, Bedford and Valentine (2012). Very important in this period is that adolescents accept their own body and the physical changes, which come with the maturation. The conclusions from the O'Dea study (2012) recommended a focus on adolescent's support within the school environment to develop a positive body image and schools should promote general physical health, healthy nutrition and regular physical activity.

There are some differences about the perception of one's own body in sports active and sports inactive adolescents in the research of Peráčková, Chovancová, Kukurová and Plevková (2018), Peráčková and Peráček (2016), where Peráčková, Chovancová, Kukurová and Plevková (2018), contrary to more studies, presented results about the differences between sports active (n=105) and sports inactive (49) adolescent girls and their attitude toward their own bodies, where they did not find any differences. But in the study by Peráčková and Peráček (2016), where there were sports active boys (n=401), sports inactive boys (n=276), sports active girls (n=582) and sports inactive girls (n=372), the authors looked for the differences in the positive perception of the body among sports active girls and boys and found out that the greatest pride from the point of view of their own attractiveness was felt by the sports active boys and the least pride was felt by the sports inactive girls.

How exercise influences the body image is a concern of many other researchers; McDonald and Thomson (1992), Hausenblas and Downs (2001), Cambell and Hausenblas (2009), Plevková and Peráčková (2016a). Exercise and sports helps to perceive the body in a positive way and be more accepting of the body's real size.

#### **1.4. Eating Habits in Adolescents**

Eating habits count as important characteristics of health. The way a person or group of people eats displays their eating habits. Eating habits are

influenced by the new trend, which is joined with the desire of possessing the ideal body. Adolescents who are not satisfied with their own body, especially with their weight, tend to prefer dieting. The growing organisms in adolescents need to be supplied with enough nutrition to stay healthy. But dissatisfaction with the body can lead to increased dieting, which could result in eating disorders.

Statistical significance was found in the research of Plevková and Peráčková (2016b) when comparing body weight, as a result of eating habits and participation in sports, of 15-16-year-old sports active and sports inactive male pupils from Bratislava and other areas of Slovakia. For the 16- and 17-year-olds, they compared the following groups: sports active and sports inactive from Bratislava, sports active from Bratislava and sports active from the other areas of Slovakia, and sports inactive from Bratislava and sports inactive from the other areas of Slovakia. In all age categories (15-16-year-old, 16-17-year-old, and 17-18-year-old), it was the heavier boys who were sports inactive.

The adolescents presented the biggest potential issues with eating habits. They did not have breakfast, which is an important meal during the day (Dejová 2016; Miklošová 2018; Ochaba, Patoprstá, Rovný et al. 2018) and they sometimes omit eating lunch and dinner.

Adolescents' weight loss or weight control behavior were predicted in relation to income, mothers BMI, peer pressure, and negative peer comments (Trembley and Lariviere 2009).

In the project, EAT researchers Timlin, Pereira, Story and Neumark Sztainer (2008) saw the decline of breakfast eating through adolescence. Weight-related concerns and behavior such as the use of unhealthy and extreme weight control methods and binge eating mostly among adolescent girls and overweight youth were presented by authors Neumark-Sztainer, Story, Hannan et al. (2002). Risk factors for eating disorders are presented in meta-analytic review of Stice (2002), where it has been revealed that negative body image is a major risk element for eating disorders. Eating behaviors are impacted by development during adolescence (Stang and Stotmeister 2017).

The Public Health Authority of Slovakia (2018) has their aim for the years 2015 – 2025 to prevent obesity, based on the fact that there is an

epidemic increase of overweight people and obesity worldwide. They identified the dangerous factors which caused these problems and they are, unhealthy eating habits and very low physical activity. The Project for the Prevention of Unhealthy Eating Habits is presented by Ochaba, Patoprstá, Rovný et al. (2018) with these nutritional goals: to achieve an energy intake balance and optimal weight, reduce energy intake from fats and sugar, increase consumption of fruits and vegetables, whole grains cereals, leguminous plants and nuts, and reduce consumption of salt. Incorrect or insufficient nutrition causes severe health problems – malnutrition, overweight, obesity. Being overweight during adolescence, as it is clear from Guo, Wu, Chumlea and Roche (2002), tends to continue during adulthood.

Mass media influences opinions, attitudes, changes of a man's behavior, and becomes a tool of power. Man has an immediate reaction to media content (because of perceiving and thinking) and if media content has this great effect, then man can get new information and knowledge that can change his/her behavior. The master thesis of Peráčková, N. (2016) involved the media contents (from over the 4058 pages) of lifestyles magazines published in Slovakia with a focus on healthy nutrition. The author recommended that readers should monitor compliance of media content with the principles of healthy nutrition, because sometimes on the internet and in some media, there are contradictory messages. Scientific journals with a long tradition of presenting research are the best control and the best source of trustworthy news and results of research. The author's recommendations are the results of her research: when communicating healthy nutrition in a graphical view, the publisher should use colors that people associate with healthy nutrition – especially green, red and yellow. When communicating healthy nutrition in spoken words, the publisher should use the words and verbs that people associate with healthy nutrition – healthy lifestyle, food, health, vegetables, fruits, fruits and vegetables and create feelings of life joy, happiness, good feeling and feeling fit. This is what readers are influenced by.

### **1.5. Sports Participation Motives in Adolescents**

Motivation is explained by Nakonečný (2009) as a subjective understanding of what man regards as beneficial and good not only for him/herself but also for humans in general. Motivation is perceived as an incentive for being active and engaged in the subjects of the interest. Motivation is defined as a process which activates human beings to perform various activities. Generally, we can say that motivation consists of an answer to a question of why we act the way we act. Exercise Participation in exercise motivates behavior in line with personal goals and the life values. Sport motives differ in individuals. Physical activity is a benefit to a person's physical and psychological well-being. One of the most important benefits of physical activity is that man can avoid many diseases, which could be as a result of insufficient motion. Physical activity gradually decreases during adolescence and the researchers must find the motives that have to be promoted for supporting health-related physical activity.

The considerable attention from researchers around the world is marked by the developed questionnaire EMI-2 of authors Markland and Hardy (1993) and Markland and Ingledew (1997), which assess 14 motives that are grouped in separate questions. The number of the questions in the whole questionnaire is 51. Each motive is compounded from 4 resp. 3 questions. The questions are phrased in such a way that it can be answered by individuals who are not currently participating in exercise (but who might do so) as well as those who are participating just in the time when the questionnaire is given. A nice idea is presented in the study of Markland and Ingledew (2007), where it is written that when the preferred motives are good appearance and weight management it will tend to make the person participate in physical activities for a longer time, because to lose weight is not a matter of one day.

The effects of body mass and body image on exercise motives emerge in adolescence, with gender differences and these effects may influence exercise adherence as noted by Ingledew and Sullivan (2002).

From the research of Peráčková, Pintérová, Chovancová (2013), it can be explained and highlighted that the most motivating effect for girls is the motive of body forming (51%), then increasing and maintaining the physical condition (47%) and then enjoyment and feeling of satisfaction when

exercising (38%). The boys prefer increasing and maintaining their physical condition (65%), then body forming (54%) and then enjoyment and satisfaction when exercising (37%). A comparison of exercise motives between adolescents from different nations (Slovaks and Germans) brings us to the study of Kukurová and Peráčková (2015). The conclusion of this research (ibid) showed that the motivation to physical activities is similar but not the same. Slovak and German pupils share the most common motives identified: positive health, strength and endurance and appearance. All three motives are among the top five most popular motives from the 14 motives that could be chosen by the respondents.

The aim of the research in the present chapter is to expand knowledge, examine and compare gender and sports participation among adolescents in relation to satisfaction or dissatisfaction with the perceptions of their own body and the relation to eating habits and sports participation motives in the era of sedentary behavior.

## **2. METHODS**

### **2.1. Participants Characteristics**

The table below (Table 2.1) shows a sample of sports active and sports inactive boys and girls involved in research for this chapter. We recruited girls and boys from Slovak secondary schools mainly from the capital city of Bratislava. There were 320 participants included in the research sample that represented sports active and sports inactive adolescent boys (n=169) and girls (n=151) based on the level of participation in extracurricular sporting activities. They all attended two compulsory Physical Education lessons in school weekly. On the basis of the literature (Grgic, Schoenfeld, Davies et al. 2018; Martínez-Pardo, Romero-Arenas, Martínez-Ruiz et al. 2014; Huang, Yamamoto, 2013; Murlasits, Reed, Wells, 2012), who wrote about the development of physical abilities at the frequency of two training units per week, we decided to divide the sample in terms of this criteria.

Respondents were categorized as sports active and sports inactive upon self-reported answers. In the group of sports active participants, we had all

the students who participated in sports activities, minimum twice a week, total of 120 minutes per week. Those who did not participate in sporting activities or were involved in sporting activities less than twice a week or less than 120 minutes per week were placed in the group of sports inactive participants.

According to van der Ploeg and Hillsdon (2017), most research studies use the term inactive to explain that sports inactive people are those who are performing insufficient amounts of moderate and vigorous activity.

**Table 2.1. Sample characteristics – number and percent of adolescent sports active boys and girls and sports inactive boys and girls**

Gender	Sports active boys and girls		Sports inactive boys and girls		Total (Σ)
	n	%	n	%	
Male (boys)	113	(56.5%)	56	(46.7%)	169
Female (girls)	87	(43.5%)	64	(53.3%)	151
Total (Σ)	200	(100%)	120	(100%)	320

The abbreviations in the whole text: n = number of participants or frequencies; % = percentage.

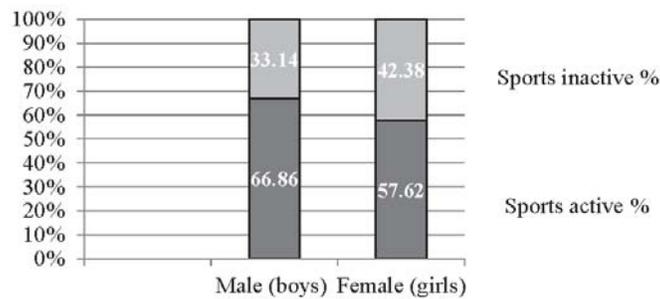


Figure 2.1. Percentage of sports active and sports inactive adolescent boys and girls.

Figure 2.1 presents the proportion of sports active and sports inactive boys and girls. There were more sports active girls (n=87; 57.62%) in the sample than sports inactive girls (n=64; 42.38%) and more sports active boys (n=113; 66.86%) than sports inactive boys (n=56; 33.14%).

The persons in a research sample ranged in age from 15 to 19 years of age, with a median 17 years of age (Figure 2.2). All participants participated voluntarily without any compensation or benefit for their participation, and

they were given informed consent. The parents consented to the participation of students who were younger than 18 years.

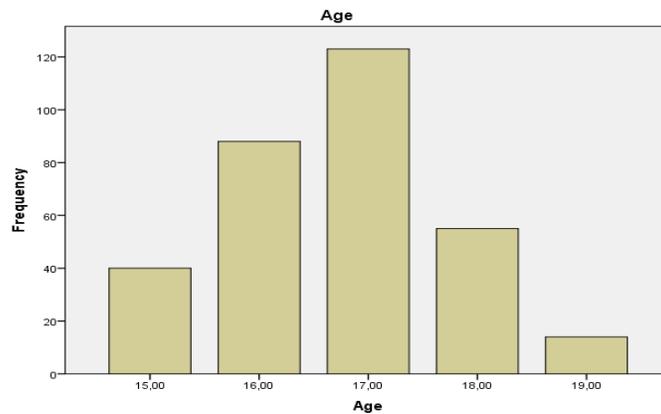


Figure 2.2. Number of participants according to age.

## 2.2. Measures and Calculation

### 2.2.1. Body height, body weight and Body Mass Index

Respondents measured their body height and body weight for Body Mass Index (BMI) calculation. The measurements were conducted during the physical education lessons.

The body height was measured upon standard condition and using measurement on the wall. Measures were taken to the nearest 0.5 centimeter. The weight was measured on the digital scale to the nearest 0.1 kilogram.

Weight status was based on height and weight measurements. Body Mass Index is easy to calculate from body height and body weight. Body mass index values were calculated according to the following formula: weight in kilograms divided by the square of height in meters. We are aware about the BMI shortage in distinguishing fat and muscles (muscles are about 18% more dense than fat). So, sports active people with the healthy body in percentage of muscles can be (in BMI) considered as overweight.

For this study, respondents were classified according to Neumark-Sztainer, Story, Hannan et al. (2002) in some BMI categories: underweight

(BMI, <15th percentile), normal weight (BMI, 16th-<84th percentile), overweight (BMI, 85th-<95th percentile), and obese (BMI,  $\geq$ 95th percentile).

Sex- and age-specific cutoff points were based on reference data from the Public Health Authority growth charts by Ševčíková, Nováková and Hamade (2004). Among adolescent girls, the mean BMI percentile values for underweight were 8.08 percentiles and the mean BMI values 17.27 kg/m<sup>2</sup>, for normal weight the mean were 45.87 percentiles and the mean BMI values 20.51 kg/m<sup>2</sup>, for overweight 89.57 percentiles and BMI values 26.81 kg/m<sup>2</sup>. Among adolescent boys, the mean BMI percentile values for underweight were 7.55 percentiles and BMI values 17.74 kg/m<sup>2</sup>, for normal weight 51.79 percentiles and BMI values 21.43 kg/m<sup>2</sup>, for overweight 89.50 percentiles and BMI values 26.81 kg/m<sup>2</sup> and for obese 98.5 percentiles and BMI values 32.37 kg/m<sup>2</sup>. The girls' sample BMI mean was 20.54 kg/m<sup>2</sup> and for the boys it was BMI mean 21.34 kg/m<sup>2</sup> (Figure 2.3).

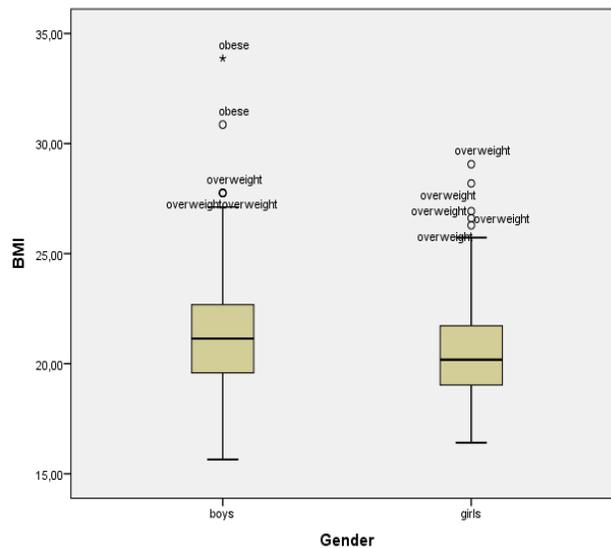


Figure 2.3. Sample characteristics – BMI mean for boys and girls.

### 2.2.2. Questionnaires

Another physical education lesson was devoted to completion of the questionnaire. Questions about involvement in physical activities and

motives for doing these activities, perceived and ideal body size, body parts satisfaction and nutritional habits were completed by 320 adolescent boys and girls. The response rate was 100%. We were present at the time of answering the questionnaire. We used self-reported questionnaires for research, which was comprised of several recognized questionnaires translated into Slovak with the back-translation procedure. For perceptions of one's own body, we used the Figure Rating Scale – FRS (Stunkard, Sørensen and Schulsinger 1983a; Stunkard, Sørensen and Schulsinger 1983b). For finding out the eating habits we used a modified questionnaire Eating Attitude Test – EAT-26 (Garner, Olmsted, Bohr and Garfinkel 1982) to determine whether some might have an eating disorder and modified questionnaire – Exercise Motivations Inventory – EMI-2 (Markland and Hardy 1993; Markland and Ingledew 1997) was used to assess participation motives in sports.

Perceived real and ideal body size was determined from the figure rating scale. We used the Stunkard's figure rating scale (Stunkard, Sørensen and Schulsinger 1983a; Stunkard, Sørensen and Schulsinger 1983b). A figure rating scale is a widely used measure of body image disturbances by many authors (Fallon and Rozin 1985; Thompson and Altabe 1991; Scagliusi, Alvarenga, Polacow et al. 2006; Cardinal, Kaciroti and Lumeng 2006; Bays, Bazata, Fox, Grandy, Gavin III, SHIELD 2009; Lo, Ho, Mak and Lam 2012; Sand, Furberg, Lian et al. 2017). They concluded that the figure rating scale is an appropriate tool for the investigation of body dissatisfaction. Figure rating scale was based on subjective self-selection of body image figures.

The index of discrepancy (dissatisfaction) was measured using a set of nine schematic figure drawings (Stunkard's Figure Rating Scale) (Stunkard, Sørensen and Schulsinger 1983a; Stunkard, Sørensen and Schulsinger 1983b) ranging in body size from very thin (number 1) to very obese (number 9), which were gender-specific (female figures for girls and male figures for boys). Respondents were asked to identify their own body size from one of the presented body figures they thought most resembled their body (real body size). Then they were asked to identify the body size they would most like to be (ideal body size). The difference is calculated by subtracting the size of the figure assigned to real body size from the size of the figure assigned to ideal body, which equal the index of discrepancy

(body dissatisfaction). A positive index of discrepancy meant body dissatisfaction because they wanted to have a bigger (more robust) body size. A negative index of discrepancy also meant body dissatisfaction because they wanted to have smaller (thinner) body size. When the difference was null it meant that the respondent was satisfied with his/her body size and his/her real and ideal figure was the same. They did not want to change their real body size because their real body size was ideal for them. The findings of Stunkard, Sørensen and Schulsinger (1983a), Stunkard, Sørensen and Schulsinger (1983b), Thompson and Altabe (1991) indicated good test-retest reliability and moderate correlations with other measures of body image dissatisfaction, eating disturbance, and overall self-esteem.

For a body parts evaluation, we prepared the modified questions from the questionnaire BPSS – Body Part Satisfaction Scale – for finding the satisfaction with eight parts from the body with the scale from 1-5 (1-very dissatisfied up to 5 very satisfied). The parts were: face, hair, body height, body weight, muscle tone, lower part of the body (hip, buttock, thighs), middle part of the body (waist and abdomen), upper part of the body (shoulders, arms, chest). The sum of the satisfaction of the selected parts indicated the satisfaction with the whole body.

The next parts of the questionnaire were the questions from the EAT-26 (Garner, Olmsted, Bohr, Paul and Garfinkel 1982) and were about the regularity of eating breakfast, second breakfast (elevenses), lunch, tea time small meal, supper – dinner, second dinner.

Participation motives were measured using the Exercise Motivations Inventory version 2 [EMI-2] (Markland and Hardy 1993; Markland and Ingledew 1997). The last part of the questionnaire used for research were 22 questions from the EMI-2 questionnaire. From the original instrument with 14 scales we used the scales related to the body and feelings: enjoyment, positive health, weight management, appearance, strength and endurance, and nimbleness. The response format was; not at all true for me (0) to very true for me (5). Scale scores were computed as the mean of item scores. In this questionnaire, the statements concerned the reasons people often give when asked why they exercise. In this instrument the answers can be taken from all persons whether they (at the time of filling out the questionnaire) exercised regularly or not. The statements were with the aim of knowing

why the person chose to exercise or might choose to exercise – “Personally, I exercise (or might exercise) ....”. Enjoyment was represented by statements such as: because I enjoy the feeling of exerting myself, because I find exercising satisfying in and of itself, for enjoyment of the experience of exercising, because I feel my best when exercising. Positive health was represented by statements such as: to have a healthy body, because I want to maintain good health, to feel healthier. Weight management was represented by statements such as: to stay slim, to lose weight, to help control my weight, because exercise helps me to burn calories. Appearance was represented by: to help me look younger, to have a good body, to improve my appearance, to look more attractive. Strength and endurance were represented by: to build up my strength, to increase my endurance, to get stronger, to develop my muscles. Nimbleness was represented by: to stay/become more agile, to maintain flexibility, to stay/become flexible.

A statistical analysis was also used with the help of IBM SPSS Statistics (Version 17 for Windows; SPSS, Chicago, IL, USA). The Shapiro-Wilk test of normality was used. To assess selected comparisons in two or more independent groups, we used Student’s *t* test, Man-Whitney U test and Kruskal-Wallis H Test according to appropriateness of normality tests. In some comparisons we calculated effect size *r* and Cohen’s *d*. The results of Spearman’s correlation was also used.

### **3. RESULTS**

#### **3.1. Satisfaction or Dissatisfaction with Body Size Depending on Gender and Participation in Sporting Activities**

Some descriptive characteristics of body height, body weight and BMI of sports active and sports inactive boys and girls are displayed in (Table 3.2). These measurements (body height and body weight) were measured in all participants by us.

The mean body height of sports active boys is on the 52<sup>nd</sup> percentile in body height charts for Slovak boys (Ševčíková, Nováková, Hamade et al. 2004). The mean body height of sports inactive boys is on the 51<sup>st</sup> percentile

in body height charts for Slovak boys. The mean body height of sports active girls is on the 75<sup>th</sup> percentile in body height charts for Slovak girls (ibid). The mean body height of sports inactive girls is on the 72<sup>nd</sup> percentile in body height charts for Slovak girls.

**Table 3.2. Sample characteristics (body height, body weight and Body mass index – BMI) in sports active and sports inactive boys and girls**

Descriptive	Characteristics	Sports active and sports inactive boys and girls				
		Sports active boys	Sports inactive boys	Sports active girls	Sports inactive girls	Total
Mean	Body height	180.76	180.38	169.02	168.45	175.04
	Body weight	70.16	68.82	58.80	58.31	64.47
	BMI	21.44	21.14	20.55	20.54	20.96
n		113	56	87	64	320
Std. Deviation	Body height	6.54	6.57	6.62	6.37	8.80
	Body weight	9.79	11.44	8.42	6.91	10.77
	BMI	2.51	3.16	2.45	2.16	2.58
Minimum	Body height	160.00	168.00	157.0	156.00	156.00
	Body weight	48.00	50.00	42.00	47.00	42.00
	BMI	15.65	16.42	16.41	16.80	15.65
Maximum	Body height	197.00	195.00	188.50	185.00	197.00
	Body weight	100.00	121.00	85.00	76.00	121.00
	BMI	30.86	33.87	29.06	28.19	33.87

The mean body weight for sports active boys is on the 62<sup>nd</sup> percentile and for sports inactive is slightly above median in the body weight charts for Slovak boys. The mean body weight for sports active girls is on the 60<sup>th</sup> percentile and for sports inactive girls is on the 59<sup>th</sup> percentile in the body weight charts for Slovak girls.

The mean BMI of sports active boys is on the 52<sup>nd</sup> percentile in BMI charts for Slovak boys (Ševčíková, Nováková, Hamade et al. 2004). The mean BMI of sports inactive boys is on the 51<sup>st</sup> percentile in BMI charts for Slovak boys. The mean BMI of sports active girls is on the 40<sup>th</sup> percentile in BMI charts for Slovak girls [ibid]. The mean BMI of sports inactive girls is on the 40<sup>th</sup> percentile in BMI charts for Slovak girls.

Boys were statistically taller than girls  $t(314.326)=16.239$ ,  $p<.001$ . Boys were statistically heavier than girls  $t(309.352)=10.930$ ,  $p<.001$ . BMI in boys was statistically higher than in girls  $t(317.190)=2.808$ ,  $p=.005$ .

The comparison among sports active and sports inactive boys and girls showed that there were statistical differences in the distribution of body height, body weight and body mass index across these groups and the Kruskal-Wallis H Test confirms  $p<.001$ .

The comparison between two selected groups presented these findings:

- There were no statistical differences between sports active and sports inactive adolescent boys neither in body height, body weight nor in body mass index (BMI).
- We did not find statistical differences in the variables, body height, body weight and BMI between sports active and sports inactive adolescent girls.
- Sports active boys were statistically taller than sports active girls  $t(184.018)= 12.498$ ,  $p<.001$ . Sports active boys were statistically heavier than sports active girls  $t(195.557)= 8.809$ ,  $p<.001$ . Sports active boys were statistically higher in the BMI values than in sports active girls  $t(187.214)= 2.528$ ,  $p=.012$ .
- Sports inactive boys were statistically taller than sports active girls  $t(118.169)= 10.060$ ,  $p<.001$ . Sports inactive boys were statistically heavier than sports active girls  $t(92.840)= 5.647$ ,  $p<.001$ . There were no statistical differences between sports inactive boys and sports active girls in BMI comparison  $t(96.510)= 1.189$ ,  $p=.237$ .
- Sports active boys were statistically taller than sports inactive girls  $t(133.858)= 12.227$ ,  $p=.001$ . Sports active boys were statistically heavier than sports inactive girls  $t(166.580)= 9.386$ ,  $p=.001$ . Sports active boys were statistically higher in the BMI values than in sports inactive girls  $t(147.690)= 2.501$ ,  $p=.009$ .
- Sports inactive boys were statistically taller than sports inactive girls  $t(114.871)= 10.058$ ,  $p<.001$ . Sports inactive boys were statistically heavier than sports inactive girls  $t(87.934)= 5.991$ ,  $p<.001$ . There were no statistical differences between sports inactive boys and sports inactive girls in BMI comparison  $t(96.169)= 1.188$ ,  $p=.238$ .

The distribution of the sample participants in BMI percentile ranges can be seen in the Table 3.3 and Figure 3.4. Most of the participants were with their BMI values in the BMI percentile range 25-50. More girls than boys were in this percentile range (Figure 3.4). The percentage of sports active and sports inactive boys and girls in BMI percentiles categories are presented in Figure 3.5.

**Table 3.3. Sample characteristics – number of cases of all participated adolescents in BMI percentile ranges with BMI mean and percentage**

	BMI percentiles categories							Total
	3-10	10-25	25-50	50-75	75-90	90-97	more 97	
Frequency	9	58	117	79	39	9	9	320
Mean BMI	16.62	18.24	19.99	21.91	24.06	25.88	28.75	20.96
Std. Deviation	.55	.71	.73	.73	.68	.83	2.29	2.58
Percent	2.8	18.1	36.6	24.7	12.2	2.8	2.8	100.0

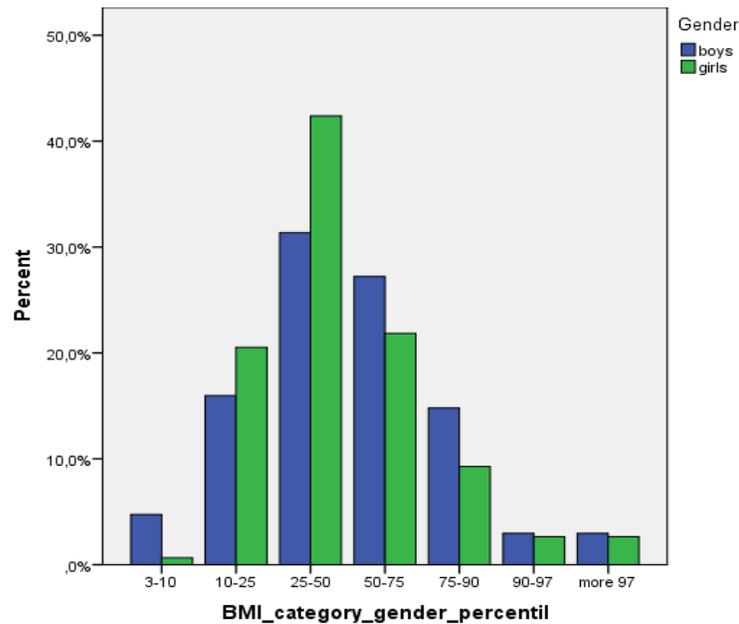


Figure 3.4. Sample characteristics: percent of boys and girls in BMI percentiles categories.

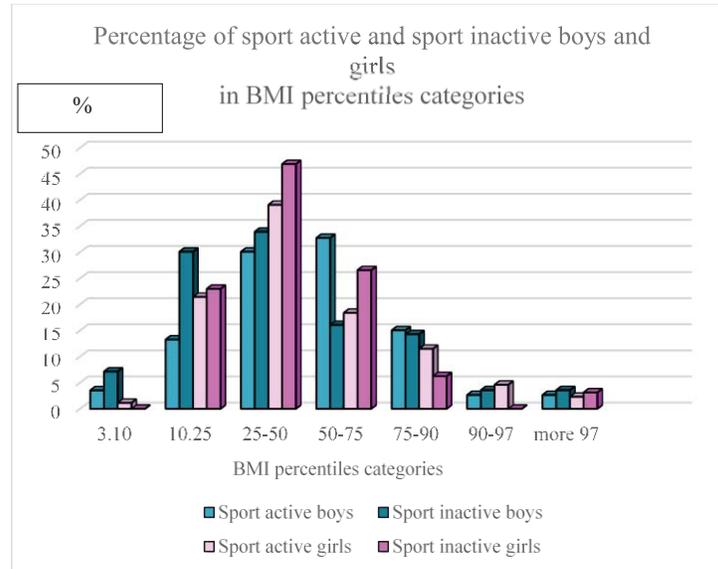


Figure 3.5. Sample characteristics: Percentage of sports active and sports inactive boys and girls in BMI percentiles categories.

Findings about the mean of BMI due to age is shown in Table 3.4 and we can see increased values of BMI with age.

**Table 3.4. Sample characteristics – mean BMI and number of cases of all participated adolescents in age categories**

	Age					Total
	15,00	16,00	17,00	18,00	19,00	
Mean BMI	19.83	20.85	20.97	21.71	21.88	20.96
n	40	88	123	55	14	320
Std. Deviation	2.07	2.19	2.78	2.85	2.15	2.58

To see in which BMI categories the boys and girls from the sample are, have a look in the Table 3.5, which presents the frequency of occurrence, BMI mean, standard deviation and percentage of occurrence in BMI categories: underweight, normal weight, overweight, and obese.

Most of the participants were in a normal weight category (81% of boys and 87% of girls). More boys than girls were in the underweight category

(13% vs 8%). The overweight category was occupied by 4.7% of boys and 4.6% of girls. In the sample there were only 1.18% of obese boys and not one girl. Figure 3.6 presents the distribution of BMI categories in boys and girls and the mean of their BMI.

**Table 3.5. Sample characteristics – number of cases in BMI percentiles categories and their BMI mean according to gender**

	BMI categories according to gender							Total
	boys underweight	boys normal weight	boys overweight	boys obese	girls underweight	girls normal weight	girls overweight	
Frequency	22	137	8	2	12	132	7	320
BMI mean	17.75	21.43	26.81	32.37	17.27	20.51	26.81	
Std. Dev.	1.14	1.82	0.98	2.13	0.40	1.73	1.43	
Percent	6.9	42.8	2.5	0.6	3.8	41.3	2.2	100.0

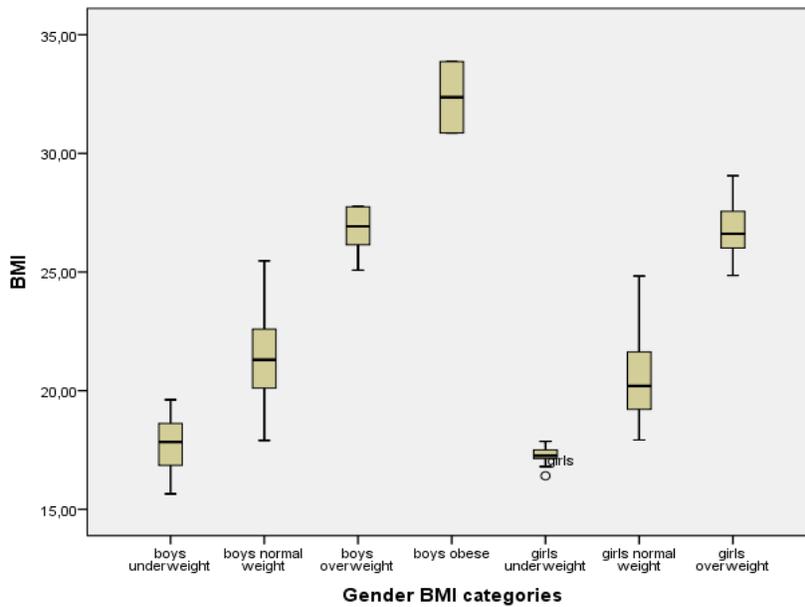


Figure 3.6. Sample characteristics: BMI mean of boys and girls in BMI categories.

The findings and the comparisons of the satisfaction and perception of one's own body depending on gender and participation in sporting activities is presented in this part of the chapter.

We must find and compare how the intention to change one's own body was in:

- Boys and girls
- Sports active boys and sports inactive boys
- Sports active girls and sports inactive girls
- Sports active boys and sports active girls
- Sports inactive boys and sports inactive girls

### *3.1.1. Satisfaction or Dissatisfaction with Body Size in Boys and Girls*

We calculated the difference between ideal body size and real body size (ideal body size – real body size) in individuals. This was the index of discrepancy and means satisfaction (value 0) or dissatisfaction with body size (plus values or minus values). In our research the index of discrepancy meant the desire of how the participant wanted to change his/her own body. The direction to be more robust (bigger) meant plus values and to be thinner (smaller) meant minus values. The index of discrepancy counts the number of figures-shift too (e.g., -5 meant desire to be 5 drawing figures thinner).

Figure 3.7 provides an overview of boys and girls and their desire to change their own body in a direction to become bigger (more robust), in a direction to become smaller (thinner) or did not want any change.

We identified that more boys than girls were satisfied with their body size (Table 3.6.; Figure 3.7.) and did not want to make any change (47.9% of boys and 36.4% of girls). 56.3% of girls wanted to have smaller (thinner) body size and 7.3% wanted to have larger (more robust) body size. 15.4% of boys wanted to have smaller (thinner) body size and 36.7% wanted to have larger (more robust) body size.

There were found statistical differences in satisfaction with the body when comparing the image of an ideal body and perceived real body between boys and girls  $t(317,834) = 8,637, p = ,000$ . Boys tended to change the body in the direction to plus 0.25 (be more robust) of shown figures from

the figure rating scale and girls tended to change the body in the direction to minus - 0.67 of the shown figures (be thinner) (Table 3.7).

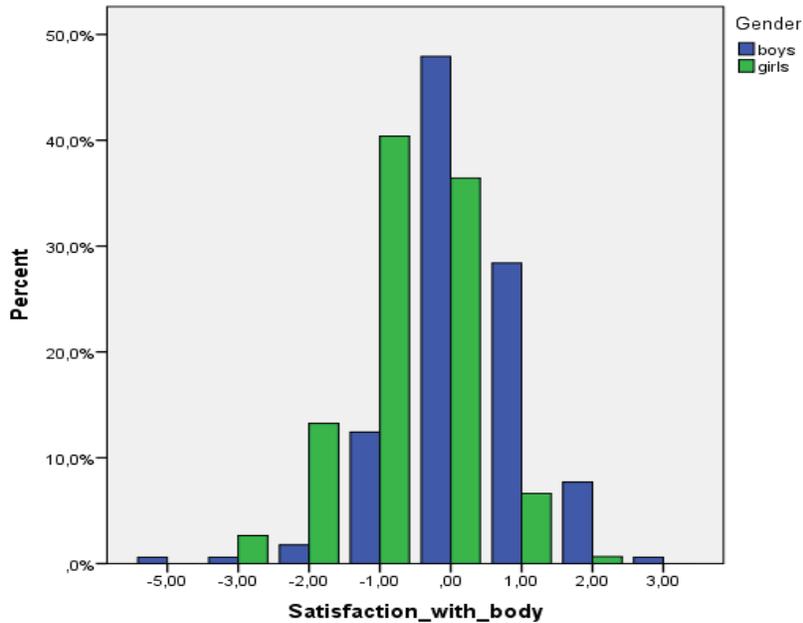


Figure 3.7. Distribution of boys and girls (%) in satisfaction or dissatisfaction with body size according to index of discrepancy (.00 – do not want any change, plus values = change body size to be bigger – more robust figure, minus values = change body size to be smaller – thinner figure).

**Table 3.6. An overview of the number of adolescents and how many of them want or do not want to change their body size – index of discrepancy**

Satisfaction or dissatisfaction with body size									
	Changes of body								
	To have smaller (thinner) figure				No change	To have bigger (more robust) figure			Total
	-5.00	-3.00	-2.00	-1.00		1.00	2.00	3.00	
Boys	1	1	3	21	81	48	13	1	169
Girls	0	4	20	61	55	10	1	0	151
Frequency (N)	1	5	23	82	136	58	14	1	320
Percent (%)	.3	1.6	7.2	25.6	42.5	18.1	4.4	.3	100.0

**Table 3.7. The mean of desired change of the body size for boys and girls**

Gender	Mean	n	Std. Deviation
boys	.25	169	.99
girls	-.67	151	.91
Total	-.18	320	1.06

*3.1.2. Satisfaction with the body size among boys and girls in relation to sport participation*

Sporting activity can change one's opinion for the desire to change something on one's own body, because sports active individuals are more satisfied with their own body than sports inactive individuals without regard to gender.

More sports inactive boys (51.8%) than sports active boys (46%) did not want any changes in their body size (Table 3.8). 16.9% of sports active boys wanted to have a thinner body and 37.1% wanted to have a more robust body. Only 12.5% of sports inactive boys wanted to have a thinner body and 35.7% wanted to have a more robust body.

Almost the same percentage of sports active and sports inactive girls (36.8% and 35.8%) did not want any changes in their body size. 8.0% of sports active girls wanted to have a more robust body and 55.2% of them wanted to have a thinner body. 6.3% of sports inactive girls wanted to have a more robust body and 57.9% of them wanted to have a thinner body.

There were no statistical differences in satisfaction with the body when comparing the image of an ideal body and perceived real body between sports active and sports inactive boys (Table 3.9). Both groups wanted to change the body size in the direction of plus 0.25 of shown figures from the figure rating scale and  $p=1.000$ .

There were no statistically significant differences in satisfaction with the body when comparing the image of an ideal body and perceived real body between sports active and sports inactive girls (Table 3.10.). Both groups wanted to change the body size in the direction of minus – 0.63 (resp. minus – 0.72) of shown figures from the figure rating scale (be thinner) and  $p=0.947$ .

**Table 3.8. Index of discrepancy in boys and girls depending on participation in sporting activities**

Satisfaction or dissatisfaction with body size among sports active and sports inactive boys and girls									
	Changes of body (number of figures – -5.00 – +3.00; frequencies – n and percent – %)								
	Have smaller (thinner) figure				No change	Have bigger (more robust) figure			Total
	-5.00 (n / %)	-3.00 (n / %)	-2.00 (n / %)	-1.00 (n / %)	.00 (n / %)	1.00 (n / %)	2.00 (n / %)	3.00 (n / %)	(n / %)
Sports active boys	1/0.9	1/0.9	1/0.9	16/14.2	52/46	31/27.3	10/8.9	1/0.9	113/100
Sports inactive boys	0/0	0/0	2/3.6	5/8.9	29/51.8	17/30.4	3/5.3	0/0	56/100
Sports active girls	0/0	2/2.4	11/12.6	35/40.2	32/36.8	6/6.8	1/1.2	0/0	87/100
Sports inactive girls	0/0	2/3.3	9/14.1	26/40.5	23/35.8	4/6.3	0/0	0/0	64/100
Frequency	1	5	23	82	136	58	14	1	320
Percent	.3	1.6	7.2	25.6	42.5	18.1	4.4	.3	100.0

**Table 3.9. The mean of desired change of the body size for sports active and sports inactive boys**

	n	Mean	Std. Deviation
Sports active boys	113	.25	1.07
Sports inactive boys	56	.25	.84

**Table 3.10. The mean of desired change of the body size for sports active and sports inactive girls**

	n	Mean	Std. Deviation
Sports active girls	87	-.63	.92
Sports inactive girls	64	-.72	.90

**Table 3.11. The mean of desired change of the body size for sports active boys and sports active girls**

	n	Mean	Std. Deviation
Sports active boys	113	.25	1.07
Sports active girls	87	-.63	.92

There were found statistical differences in satisfaction with the body when comparing the image of an ideal body and perceived real body between sports active boys and sports active girls  $p < .001$ . Sports active boys tended to change the body in the direction of plus 0.25 of shown figures from the figure rating scale (be more robust) and sports active girls tended to change the body in direction of minus - 0.63 of the shown figures (be thinner) (Table 3.11).

**Table 3.12. The mean of desired change of the body size for sports inactive boys and sports inactive girls**

	n	Mean	Std. Deviation
Sports inactive boys	56	.25	.84
Sports inactive girls	64	-.72	.90

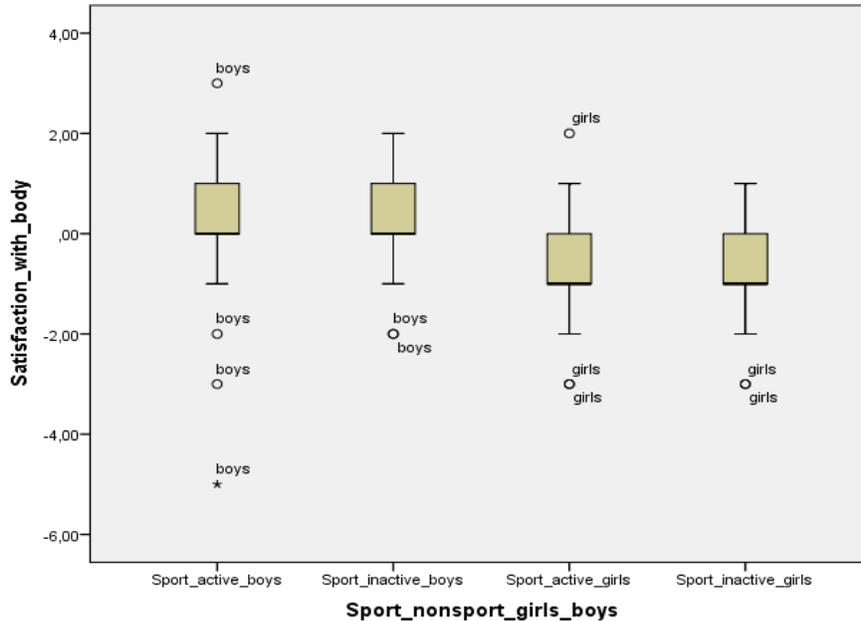


Figure 3.8. Satisfaction or dissatisfaction among sports active and sports inactive boys and girls.

There were found statistical differences in satisfaction with the body when compared to the image of an ideal body and perceived real body between sports inactive boys and sports inactive girls  $p < .001$ . Sports inactive boys tended to change the body in the direction of plus 0.25 of shown figures from the figure rating scale (be more robust) and sports inactive girls tended to change the body in direction of minus  $-0.72$  of the shown figures (be thinner) (Table 3.12).

The index of discrepancy was greater among girls in comparison to boys. Girls were less satisfied with the body size and wanted to be thinner than more robust, but boys wanted to be more robust than thinner. The most satisfied with body size were sports active boys, then sports inactive boys, sports active girls, and last place was taken with sports inactive girls (Figure 3.8).

### 3.1.3. Satisfaction or Dissatisfaction with Selected Body Features Depending on Gender and Participation in Sporting Activities

In this part of the chapter we wanted to find and compare selected body features depending on gender and participation in sporting activities. Table 3.13 shows the selected body feature and the satisfaction with them in participating adolescent boys and girls.

**Table 3.13. Satisfaction or dissatisfaction with selected body features in boys and girls**

		Mean		Std. Deviation	
		Gender		Gender	
		boys	girls	boys	girls
Mean	Face satisfaction	3.40	3.23	1.09	.72
	Hairs satisfaction	3.66	3.60	1.24	1.08
	Body height satisfaction	3.69	3.74	1.35	1.15
	Body weight satisfaction	3.12	2.90	1.19	1.30
	Muscle tone satisfaction	2.97	2.79	1.19	1.13
	Lower body part satisfaction	3.46	2.37	1.27	1.27
	Middle body part satisfaction	3.39	2.70	1.02	1.16
	Upper body part satisfaction	3.27	3.27	1.04	1.08
	Satisfaction in whole	3.37	3.07	.62	.55
n		169	151		

The legend: 1 very dissatisfied, 2 dissatisfied, 3 neither dissatisfied nor satisfied, 4 satisfied, 5 very satisfied.

From Table 3.13 we can identify the highest satisfaction with the body height and hair in boys and girls. At the end of satisfaction order was boys' satisfaction with muscle tone and in girls the satisfaction with lower body part. We found the statistical differences (both  $p < .001$ ) between boys and girls in satisfaction with lower and middle body parts. The boys were more satisfied with those parts of their bodies. A statistical difference was found in satisfaction with the whole body, when taken into consideration all selected body features  $p < .001$ .

Table 3.14 shows the selected body features that were taken into consideration in satisfaction or dissatisfaction in sports active and sports inactive boys and girls.

A Kruskal-Wallis H test showed that there was statistically significant difference in body weight satisfaction between different groups of boys and girls depending on participation in sporting activities  $\chi^2(3)=12.718$ ,  $p=0.005$ , with mean rank of 183.02 for sports active boys, 136.63 for sports inactive boys, 147.98 for sports active girls, and 158.65 for sports inactive girls. We found statistically significant differences in muscle tone satisfaction  $\chi^2(3)=12.101$ ,  $p=0.007$ , with mean rank of 181.95 for sports active boys, 134.11 for sports inactive boys, 155.70 for sports active girls, and 152.26 for sports inactive girls. Then we found statistically significant difference in lower body part satisfaction  $\chi^2(3)=50.542$ ,  $p<.001$ , with mean rank of 196.79 for sports active boys, 189.35 for sports inactive boys, 126.41 for sports active girls, and 117.52 for sports inactive girls, in middle body part satisfaction  $\chi^2(3)=30.701$ ,  $p= p<.001$ , with mean rank of 186.57 for sports active boys, 186.94 for sports inactive boys, 129.98 for sports active girls, and 132.83 for sports inactive girls. The satisfaction with the whole body when concerning all the selected body features presents statistical differences  $\chi^2(3)=23.160$ ,  $p<.001$ , with mean rank of 191.54 for sports active boys, 162.20 for sports inactive boys, 133.33 for sports active girls, and 141.13 for sports inactive girls.

The sports active boys were statistically, significantly more satisfied in body weight satisfaction compared to sports inactive boys ( $p=.001$ ) and sports active girls ( $p=.008$ ). Sports active boys were statistically, significantly more satisfied in muscle tone satisfaction compared to sports inactive boys ( $p=.001$ ) (but muscle tone satisfaction was at the end of the ranking order in both groups), compared to sports active girls ( $p=.030$ ) and sports inactive girls ( $p=.019$ ). Sports active boys and sports inactive boys were statistically, significantly more satisfied with lower body part satisfaction, middle body part satisfaction, and satisfaction with body compared to sports active girls and sports inactive girls. For both groups (sports active boys and sports inactive boys), the statistical significance was  $p<.001$  for satisfaction with lower and middle part of the body and the satisfaction with the body too.

**Table 3.14. Satisfaction or dissatisfaction of selected body features in sports active and sports inactive boys and girls**

		Sports active and sports inactive boys and girls			
		Sports active boys	Sports inactive boys	Sports active girls	Sports inactive girls
Mean	Face satisfaction	3.43	3.36	3.18	3.28
	Hair satisfaction	3.64	3.70	3.60	3.59
	Body height satisfaction	3.68	3.71	3.70	3.78
	Body weight satisfaction	3.33	2.70	2.84	2.98
	Muscle tone satisfaction	3.18	2.54	2.82	2.75
	Lower body part satisfaction	3.50	3.40	2.44	2.28
	Middle body part satisfaction	3.39	3.40	2.68	2.72
	Upper body part satisfaction	3.31	3.18	3.21	3.34
	Satisfaction with the whole body	3.43	3.25	3.06	3.09
Std. Deviation	Face satisfaction	1.05	1.17	.77	.65
	Hair satisfaction	1.23	1.26	1.07	1.09
	Body height satisfaction	1.38	1.30	1.12	1.19
	Body weight satisfaction	1.18	1.11	1.34	1.25
	Muscle tone satisfaction	1.19	1.06	1.14	1.13
	Lower body part satisfaction	1.25	1.32	1.26	1.28
	Middle body part satisfaction	.99	1.11	1.18	1.13
	Upper body part satisfaction	1.03	1.08	1.09	1.07
	Satisfaction with the whole body	.65	.54	.55	.56

We did not find any statistical differences in satisfaction with selected body features between sports active and sports inactive girls. Both groups are more or less satisfied at the same level without statistical differences. When one group is satisfied with the body height, another group is satisfied too. When one group is dissatisfied with the lower body part, another group is dissatisfied too.

**Table 3.15. Correlation between selected body features that present satisfaction with them**

Correlations		Face	Hair	Body height	Body weight	Muscle tone	Lower body part	Middle body part_	Upper body part	Satisfaction with whole body
Face	Correlation Coefficient	1.000								
	Sig. (2-tailed)	.								
Hair	Correlation Coefficient	.318**	1.000							
	Sig. (2-tailed)	.000	.							
Body height	Correlation Coefficient	.009	.089	1.000						
	Sig. (2-tailed)	.868	.114	.						
Body weight	Correlation Coefficient	-.004	.074	.275**	1.000					
	Sig. (2-tailed)	.949	.188	.000	.					
Muscle tone	Correlation Coefficient	-.008	.126*	.213**	.524**	1.000				
	Sig. (2-tailed)	.887	.024	.000	.000	.				
Lower body part	Correlation Coefficient	.093	.095	.120*	.316**	.175**	1.000			
	Sig. (2-tailed)	.096	.089	.032	.000	.002	.			
Middle body part	Correlation Coefficient	.117*	.043	.044	.183**	.099	.519**	1.000		
	Sig. (2-tailed)	.037	.442	.429	.001	.077	.000	.		
Upper body part	Correlation Coefficient	.123*	.161**	.028	.086	.114*	.182**	.220**	1.000	
	Sig. (2-tailed)	.027	.004	.612	.125	.041	.001	.000	.	
Satisfaction with whole body	Correlation Coefficient	.319**	.447**	.443**	.617**	.552**	.649**	.518**	.412**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

The strength of a monotonic relationship between paired data from Table 3.15 among 320 adolescents shows:

1. Several weak positive correlations between body features' satisfaction.
  - Face satisfaction to hair satisfaction and satisfaction with whole body.
  - Hair satisfaction to face satisfaction.
  - Body height satisfaction to body weight satisfaction and to muscle tone satisfaction.
  - Body weight satisfaction to body height and to lower body part satisfaction.
  - Muscle tone satisfaction to body height satisfaction.
  - Lower body part satisfaction to body weight satisfaction.
  - Middle body part satisfaction to upper body part satisfaction.
  - Upper body part satisfaction to middle body part satisfaction.
  - Satisfaction with the whole body to face satisfaction.
2. Several moderate positive correlations.
  - Hair satisfaction to satisfaction with the whole body.
  - Body height satisfaction to satisfaction with the whole body.
  - Body weight satisfaction to muscle tone satisfaction.
  - Muscle tone satisfaction to body weight satisfaction and to satisfaction with the whole body.
  - Lower body part satisfaction to middle body part satisfaction.
  - Middle body part satisfaction to lower body part satisfaction and to satisfaction with the whole body.
  - Upper body part satisfaction to satisfaction with the whole body.
  - Satisfaction with the whole body to hair satisfaction, to body height satisfaction, to muscle tone satisfaction, to middle body part satisfaction and to upper body part satisfaction.
3. Several strong positive correlations.
  - Body weight satisfaction to satisfaction with the whole body.
  - Lower body part satisfaction to satisfaction with the whole body.

- Satisfaction with the whole body to body weight satisfaction and lower body part satisfaction.

### **3.2. Eating Habits and Concerns about Eating, Depending on Gender and Participation in Sporting Activities**

We had to find and compare eating habits and concerns about eating, depending on gender and participation in sporting activities in:

Boys and girls

- Sports active boys and sports inactive boys
- Sports active girls and sports inactive girls
- Sports active boys and sports active girls
- Sports inactive boys and sports inactive girls

Boys rarely or never felt guilty after eating, loved when their stomachs were empty, avoid eating even when they were hungry, were afraid about weight gain, and rarely or never had a day without eating. Girls rarely or never ate fast food and loved when their stomachs were empty.

When comparing boys and girls in presented items from Table 3.16 we found statistical differences in most of the items. Girls more often than boys avoid eating  $t(288.414)=2.652$ ,  $p=0.008$ , had fear of weight gain  $t(286.845)=6.957$ ,  $p<.001$ , felt guilty after eating  $t(287.066)=4.987$ ,  $p<.001$ , thought too long about eating  $t(266.131)=5.276$ ,  $p<.001$ , felt fat, when they had a full stomach  $t(307.590)=4.259$ ,  $p<.001$ .

Boys more often than girls felt judgement from others that they are too skinny  $t(317.998)=-2.306$ ,  $p=0.022$ , and ate fast food  $t(254.926)=-10.581$ ,  $p<.001$ .

We did not find statistical differences between sports active and sports inactive boys and sports active and sports inactive girls when comparing presented items (Table 3.17).

There were several statistical differences between eating patterns in sports active and sports inactive boys and sports active and sports inactive girls.

**Table 3.16. Concerns about eating and food in boys and girls**

	Mean		Std. Deviation	
	Gender		Gender	
	Boys (n=169)	Girls (n=151)	boys	girls
Avoid eating even when being hungry	5.14	4.80	1.01	1.25
Fear of weight gain	5.14	4.02	1.26	1.57
Feeling guilty after eating	5.38	4.63	1.18	1.47
Cannot stop eating when begin eating	4.25	4.19	1.51	1.52
Judgement of others I am too skinny	3.95	4.36	1.71	1.53
Social pressure for eating	4.60	4.92	1.70	1.36
Too long thinking about eating	4.87	3.93	1.28	1.81
Liking empty stomach	5.25	5.32	1.34	1.11
Feeling fat when full stomach	4.49	3.61	1.77	1.90
Eating fast food	4.06	5.36	1.41	.72
Day without eating	5.19	4.95	.97	1.38

The legend: 1 – always, 2 – usually, 3 – often, 4 – sometimes, 5 – rarely, 6 – never.

**Table 3.17. Concerns about eating and food in sports active and sports inactive boys and girls**

	Boys				Girls			
	Sports active		Sports inactive		Sports active		Sports inactive	
	(n=113)		(n=56)		(n=87)		(n=64)	
Items	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Avoid eating	5.12	1.05	5.18	.94	4.77	1.33	4.84	1.16
Fear of weight gain	5.22	1.17	4.96	1.41	3.83	1.58	4.28	1.54
Feeling guilty after eating	5.44	1.09	5.25	1.34	4.60	1.51	4.67	1.43
Cannot stop eating	4.35	1.51	4.04	1.51	4.25	1.53	4.09	1.51
Judgement of others too skinny	4.09	1.59	3.66	1.91	4.25	1.56	4.52	1.48
Social pressure for eating	4.67	1.68	4.45	1.74	5.01	1.30	4.80	1.44
Too long thinking about eating	4.94	1.20	4.73	1.43	3.77	1.85	4.16	1.75
Liking empty stomach	5.34	1.26	5.07	1.49	5.33	1.06	5.30	1.18
Feeling fat when full stomach	4.62	1.70	4.21	1.89	3.46	1.95	3.81	1.82
Eating fast food	4.16	1.31	3.86	1.60	5.45	.66	5.25	.78
Day without eating	5.24	.95	5.09	1.01	4.91	1.38	5.02	1.39

A Kruskal-Wallis H test showed that there were statistically significant differences in concerns about eating for fear of weight gain between different groups of boys and girls depending on participation in sporting activities  $\chi^2(3)=51.914$ ,  $p<.001$ , with mean rank of 197.62 for sports active boys, 183.41 for sports inactive boys, 113.71 for sports active girls, and 138.52 for sports inactive girls. We found statistically significant differences in feeling guilty after eating  $\chi^2(3)=33.909$ ,  $p<.001$ , with mean rank of 188.78 for sports active boys, 180.19 for sports inactive boys, 131.38 for sports active girls, and 132.93 for sports inactive girls. Then we found statistically significant differences in too long thinking about eating  $\chi^2(3)=23.330$ ,  $p<.001$ , with mean rank of 185.51 for sports active boys, 175.82 for sports inactive boys, 128.50 for sports active girls, and 146.43 for sports inactive girls, feeling fat, when stomach feels full  $\chi^2(3)=21.761$ ,  $p<.001$ , with mean rank of 187.40 for sports active boys, 168.35 for sports inactive boys, 130.95 for sports active girls, and 200.63 for sports inactive girls.

The item – eating fast food, presents statistical differences  $\chi^2(3)=94.964$ ,  $p<.001$ , with mean rank of 118.44 for sports active boys, 109.11 for sports inactive boys, 218.70 for sports active girls, and 200.63 for sports inactive girls.

We found statistical differences between items from Table 3.18 between boys and girls in eating breakfast  $t(317.395)=-6.357$ ,  $p<.001$ , and in eating second dinner  $t(268.052)=10.498$ ,  $p<.001$ . Girls declare more days of eating breakfast than boys (effect size  $r=-0.334$ , small effect; Cohen's  $d=-0.7088$ , large effect) and boys declare more days eating second dinner than girls (Table 3.18) (effect size  $r=0.501$ , moderate effect; Cohen's  $d=1.15795$ , very large effect).

We made a statistical comparison in eaten meals (Table 3.19). A Kruskal-Wallis H test showed that there were statistically significant differences in eating habits in eating breakfast between different groups of boys and girls depending on participation in sporting activities  $\chi^2(3)=47.702$ ,  $p<.001$ , with mean rank of 145.77 for sports active boys, 101.60 for sports inactive boys, 197.96 for sports active girls, and 187.12 for sports inactive girls. We found statistically significant differences in eating lunch  $\chi^2(3)=8.054$ ,  $p=0.045$ , with mean rank of 161.15 for sports active boys, 135.98 for sports inactive boys, 172.48 for sports active girls, and 164.52 for

sports inactive girls. Then we found statistically significant differences in eating dinner  $\chi^2(3)=16.706$ ,  $p=0.001$ , with mean rank of 162.60 for sports active boys, 124.35 for sports inactive boys, 184.06 for sports active girls, and 156.41 for sports inactive girls, eating second dinner  $\chi^2(3)=77.727$ ,  $p<.001$ , with mean rank of 197.98 for sports active boys, 209.07 for sports inactive boys, 109.22 for sports active girls, and 121.52 for sports inactive girls.

**Table 3.18. The mean of eaten meals in 28 days in boys and girls**

Eaten in 28 days	Mean		Std. Deviation	
	Gender		Gender	
	boys	girls	boys	girls
Eaten meal – breakfast	2.04	3.35	1.99	1.70
Eaten meal – snack	3.83	4.07	1.37	1.57
Eaten meal – lunch	4.63	4.78	.91	.96
Eaten meal – afternoon snack	2.53	2.76	1.82	1.96
Eaten meal – dinner	4.08	4.38	1.48	1.45
Eaten meal – second dinner	2.43	.70	1.85	1.03

The legend: 0 – not eaten, 1 – eaten rarely (1-5 days), 2 – eaten less than one half (6-12 days), 3 – eaten about half of the days (13-15 days), 4 – eaten more than half of the days (16-22 days), 5 – eaten almost every day (23-27 days), 6 – eaten every day (28 days).

There were found statistical differences in eaten breakfast and dinner between sports active and sports inactive boys. More often eaten were breakfast ( $U=2450.00$ ,  $p=.014$ ) and dinner ( $U=2376.00$ ,  $p=.004$ ) in sports active boys than in sports inactive boys. Statistically more often, sports active boys rather than sports active girls ate second dinner ( $U=2217.00$ ,  $p<.001$ ). Sports active girls statistically more often ate breakfast ( $U=3426$ ,  $p<.001$ ), snack ( $U=3907.00$ ,  $p=.010$ ) than sports active boys. Sports active girls statistically more often ate breakfast ( $U=888.50$ ,  $p<.001$ ), lunch ( $U=1876.00$ ,  $p=.005$ ), dinner ( $U=1540.00$ ,  $p<.001$ ) than sports inactive boys. Sports inactive boys statistically more often ate second dinner than sports active girls ( $U=927.00$ ,  $p<.001$ ) and sports inactive girls ( $U=791.00$ ,  $p<.001$ ). Sports inactive girls statistically more often ate breakfast ( $U=755.00$ ,  $p<.001$ ), lunch ( $U=1464.00$ ,  $p=.034$ ), afternoon snack ( $U=1396.50$ ,  $p=.035$ ) than sports inactive boys.

**Table 3.19. The mean of eaten meals in 28 days in sports active and sports inactive boys and girls**

	Boys				Girls			
	Sports active (n=113)		Sports inactive (n=56)		Sports active (n=87)		Sports inactive (n=64)	
n	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Eaten in 28 days								
Eaten meal – breakfast	2.38	2.125	1.36	1.48	3.47	1.66	3.19	1.75
Eaten meal – snack	3.81	1.323	3.88	1.48	4.14	1.56	3.97	1.59
Eaten meal – lunch	4.70	.94	4.50	.83	4.81	.99	4.75	.93
Eaten meal – afternoon snack	2.72	1.80	2.16	1.81	2.71	2.10	2.81	1.76
Eaten meal – dinner	4.28	1.40	3.68	1.57	4.58	1.34	4.13	1.56
Eaten meal – second dinner	2.36	1.88	2.57	1.80	.62	.97	.81	1.10

A statistically significant difference was found in favor of girls, between boys and girls in the comparison of the use of pills to lose weight  $t(274.534)=2.356$ ,  $p=0.019$  and the use of diet to lose weight  $t(312.409)=11.321$ ,  $p<.001$ . Girls tended more often than boys to use pills or diet to lose the weight.

82.76% of sports active girls used diet to lose weight, then 67.19% of sports inactive girls, 26.79% of sports inactive boys and only 20.35% of sports active boys (Table 3.20). More girls than boys used diet to lose weight. Not so many girls or boys used pills to lose weight as they used to use diet. The order of sports active and sports inactive girls and boys is the same in using diet and ranges from 19.54% to 7.08%.

A Kruskal-Wallis H test showed that there was a statistically significant difference in the use of diet to lose weight between different groups of boys and girls depending on participation in sporting activities  $\chi^2(3)=95.975$ ,  $p<.001$ , with mean rank of 204.43 for sports active boys, 194.14 for sports inactive boys, 104.59 for sports active girls, and 129.50 for sports inactive girls.

By comparison, in sports active and sports inactive boys, we did not find any statistical differences in the use of pills to lose weight ( $p=.245$ ) and in the use of diet to lose weight ( $p=.347$ ). By comparison, in sports active and sports inactive girls, we found there were statistical differences in using diet to lose weight ( $U=2350.50$ ,  $p=.027$ ). More sports active girls than sports inactive girls used dieting to lose weight. No statistical differences were found in the use the pills to lose weight in sports active and sports inactive girls ( $p=.536$ ). More sports active girls than sports active boys used pills to lose weight ( $U=4303.00$ ,  $p=.008$ ) and to diet to lose weight ( $U=1848.00$ ,  $p<.001$ ). More sports inactive girls than sports inactive boys used the diet to lose weight ( $U=1068.00$ ,  $p<.001$ ). No statistical difference was found between sports inactive girls and sports inactive boys in comparing the use of pills to lose weight ( $p=.626$ ).

**Table 3.20. The frequency, percentage of occurrence and the mean of use pill or diet to lose weight in sports active and sports inactive boys and girls**

	Boys				Girls			
	Sports active		Sports inactive		Sports active		Sports inactive	
	Yes (n/%)	No (n/%)	Yes (n/%)	No (n/%)	Yes (n/%)	No (n/%)	Yes (n/%)	No (n/%)
Use of Pills to lose weight	8/7.08	105/92.92	7/12.5	49/87.5	17/19.54	70/80.46	10/15.63	54/84.37
Use of Diet to lose weight	23/20.35	90/79.65	15/26.79	41/73.21	72/82.76	15/17.24	43/67.19	21/32.81
n	113		56		87		64	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Use of Pills to lose weight	1.93	.26	1.88	.33	1.81	.40	1.84	.37
Use of Diet to lose weight	1.80	.40	1.73	.45	1.17	.38	1.33	.47

### 3.3. Motives for Exercising Depending on Gender and Participation in Sporting Activities

In this part we wanted to find and compare the motives for being active in sports or exercise depending on gender and participation in sporting activities. We focused on finding and comparing the motives for being active in sports between:

- Boys and girls
- Sports active boys and sports inactive boys
- Sports active girls and sports inactive girls
- Sports active boys and sports active girls
- Sports inactive boys and sports inactive girls

**Table 3.21. The statements for creating motives for exercise**

	Boys (n=169)		Girls (n=151)	
	Mean	Std. Deviation	Mean	Std. Deviation
Exercise to stay slim	2.18	1.55	2.84	1.55
Look nice	3.48	1.05	3.48	1.39
Have a healthy body	3.31	1.14	3.87	1.19
Build up my strength	3.16	1.35	3.55	1.30
Enjoy time of exercising	3	1.41	2.77	1.50
Become more agile	3.30	1.17	3.01	1.45
To lose weight	2.74	1.19	2.72	1.68
To have a body in good form	2.94	1.52	3.93	1.14
Maintain good health	3.08	1.33	3.72	1.30
Increase endurance	3.59	0.95	3.72	1.15
Find exercising satisfying	3.05	1.16	3.26	1.32
Maintain flexibility	2.87	1.36	3.40	1.26
Control weight	3.05	1.22	2.82	1.66
Improve appearance	3.02	1.35	3.29	1.58
Feel healthier	3.16	1.33	3.92	1.07
Get stronger	3.24	1.24	3.65	1.30
Enjoyment of the experience of exercising	3.12	1.15	3.80	4.38
Become flexible	2.75	1.39	3.13	1.38
Helps burn calories	2.81	1.30	3.08	1.62
Look more attractive	2.94	1.39	3	1.59
Develop muscles	3.37	1.17	3.41	1.43
Feel at the best when exercising	2.55	1.40	3.19	1.54

Boys and girls answered this part of questionnaire with the strength of personal statements for exercising- if the answer was not at all true for him/her, partly true or very true for him/her. The strength of statements was stronger (higher) in girls (Table 3.21.).

The girls' answers were about 6.27% stronger in presented values than boys'. The order of the five strongest personal statements for girls is: 1. To have a body in good form. 2. To feel healthier. 3. To have a healthy body. 4. Enjoyment of the experience of exercising. 5-6. To maintain good health and to increase endurance (the same height of values). For boys the order is not the same as for girls but this: 1. To increase endurance. 2. To look nice. 3. To develop muscles. 4. To have a healthy body. 5. To become more flexible. On the other end of the order for girls is the statement that they exercise to lose weight. For boys the statement is that they exercise to stay slim.

**Table 3.22. Motives for exercising in boys and girls**

	Mean		Std. Deviation	
	Gender		Gender	
	Boys (n=169)	Girls (n=151)	Boys	Girls
Enjoyment	2.93	3.27	.89	1.53
Positive Health	3.18	3.83	1.04	.99
Weight management	2.69	2.86	.99	1.37
Appearance	3.09	3.43	1.03	1.18
Strength and endurance	3.33	3.59	.90	1.03
Nimbleness	2.97	3.18	1.02	1.01

The statistical differences in a comparison of boys and girls are recorded in several motives: enjoyment  $t(235.921)=-2.366$ ,  $p=0.019$ , positive health  $t(316.402)=-5.805$ ,  $p<.001$ , appearance  $t(299.733)=-2.738$ ,  $p=0.007$ , strength and endurance  $t(299.756)=-2.338$ ,  $p=0.020$  in favor of girls.

In table (Table 3.22) are presented the mean values for statements given from boys and girls. The strongest motives for exercise for boys were strength and endurance, positive health, and appearance. For girls, the most important motives were: positive health, strength and endurance, and appearance.

**Table 3.23. Motives for exercising in sports active and sports inactive girls**

	n		Mean		Std. Deviation	
	Sports active girls	Sports inactive girls	Sports active girls (n=87)	Sports inactive girls (n=64)	Sports active girls	Sports inactive girls
Enjoyment	87	64	3.32	3.20	1.15	1.94
Positive Health	87	64	3.81	3.88	1.02	.97
Weight management	87	64	2.81	2.93	1.37	1.38
Appearance	87	64	3.44	3.41	1.23	1.12
Strength and endurance	87	64	3.59	3.59	1.08	.95
Nimbleness	87	64	3.21	3.15	1.08	.98

**Table 3.24. Motives for exercising in sports active and sports inactive boys**

	n		Mean		Std. Deviation	
	Sports active boys	Sports inactive boys	Sports active boys (n=113)	Sports inactive boys (n=56)	Sports active boys	Sports inactive boys
Enjoyment	113	56	3.20	2.38	.84	.73
Positive Health	113	56	3.46	2.60	.96	.95
Weight management	113	56	2.93	2.21	1.01	.76
Appearance	113	56	3.43	2.39	.99	.72
Strength and endurance	111	56	3.60	2.81	.82	.81
Nimbleness	113	56	3.24	2.44	.93	.98

The order of strength of exercise motives for sports active girls is in the Table 3.23: positive health, strength and endurance, appearance, enjoyment, nimbleness and weight management. The order of strength of exercise motives for sports inactive girls is the same as for sports active girls.

Sports active boys had higher values for exercise motives than sports inactive boys (Table 3.24) in all presented motives. The order of strength of exercise motives for sports active boys is: strength and endurance, positive health, appearance, nimbleness, enjoyment and weight management. The order of strength of exercise motives for sports inactive boys is: strength and endurance, positive health, nimbleness, appearance, enjoyment and weight management.

A Kruskal-Wallis H test showed that there was a statistically significant difference in selected exercise motives: in the motive enjoyment between different groups of boys and girls depending on participation in sporting activities  $\chi^2(3)=36.705$ ,  $p<.001$ , with mean rank of 171.95 for sports active boys, 94.78 for sports inactive boys, 185.67 for sports active girls, and 163.58 for sports inactive girls. We found a statistically significant difference in the motive positive health  $\chi^2(3)=53.632$ ,  $p<.001$ , with mean rank of 156.36 for sports active boys, 86.22 for sports inactive boys, 189.20 for sports active girls, and 193.78 for sports inactive girls. Then we found a statistically significant difference in the motive weight management  $\chi^2(3)=24.500$ ,  $p<.001$ , with mean rank of 174.14 for sports active boys, 105.79 for sports inactive boys, 165.75 for sports active girls, and 177.14 for sports inactive girls, in the motive appearance  $\chi^2(3)=46.763$ ,  $p<.001$ , with mean rank of 175.38 for sports active boys, 83.96 for sports inactive boys, 178.68 for sports active girls, 176.38 for sports inactive girls, in the motive strength and endurance  $\chi^2(3)=34.692$ ,  $p<.001$ , with mean rank of 169.92 for sports active boys, 94.52 for sports inactive boys, 178.68 for sports active girls, and 172.21 for sports inactive girls, and in the motive nimbleness  $\chi^2(3)=26.936$ ,  $p<.001$ , with mean rank of 178.02 for sports active boys, 103.80 for sports inactive boys, 172.44 for sports active girls, 162.95 for sports inactive girls.

#### **4. DISCUSSION**

This chapter examined association between body satisfaction or dissatisfaction, eating habits and motives for exercising in boys and girls and in sports active and sports inactive adolescent boys and girls.

The basic part of a healthy lifestyle in adolescent boys and girls is physical activity that brings many healthy, social, and psychological benefits. Many authors found a decline of physical activity with age (Cavill, Kahlmeier and Racioppi 2006; Danzon 2006; Gordon-Larsen, Nelson and Popkin 2004; Aarnio, Winter, Peltonen et al. 2002; Hallal, Andersen, Bull et al. 2012; Cavill, Biddle and Sallis 2001; Sallis, Prochaska and Taylor 2000; Peráčková 1994; Peráčková 2010; Telama and Yang 2000; Caspersen,

Pereira and Curran 2000; Biddle, Gorely and Stensel 2004). With the onset of the era of sedentary lifestyles, the effects of the positive action of physical activity are lost because it simply disappears from the daily mode. The daily calorie intake is not equal to energy expenditure and the problems with body weight and body dissatisfaction arise (Patrick, Norman, Calfas et al. 2004; Peráčková, Chovancová, Kukurová and Plevková 2018; McDonald and Thomson 1992; Paxton, Eisenberg and Neumark-Sztainer 2006; Mäkinen, Puukko-Viertomies, Lindberg et al. 2012). Body dissatisfaction is joined with eating disorders (Trembley and Lariviere 2009; Cattarin and Thompson 1994; Probst, Pieters and Vanderlinden 2008; Sánchez-Carracedo, Neumark-Sztainer and López-Guimerà 2012) and with a distorted perception of one's body (Fallon and Rozin 1985; Brener, Eaton, Lowry and McManus 2004; Alwan, Viswanathan, Paccaud and Bovet 2011). Concerns about body shape are common among young adolescent boys and girls (Cooper, P. J, Taylor, Cooper, Z. and Fairburn 1987; Peráčková and Chovancová 2013). The body image, body schema, and body size has been the subject of a large amount of research (Grogan 1998; Bergeron 2007; Dittmar 2009; Bays, Bazata, Fox, Grandy, Gavin III and SHIELD study group 2009; Muth and Cash 1997; Hausenblas and Fallon 2002; Fialová 2006; Ansari, Clausen, Mabhala and Stock 2010; Faragas, Radu and Rus 2015). A meta-analysis about exercise and body image presented by Hausenblas and Fallon (2006), indicated that: (a) people who exercise had a more positive body image than those who do not; (b) exercise intervention participants reported a more positive body image post intervention compared to the nonexercising control participants; and (c) people who exercise had a significant improvement in body image scores following an exercise intervention. We concluded that exercise was associated with an improved body image. Moderating variables and implications for exercise prescription to improve body image were discussed.

There were no statistical differences in our research between sports active and sports inactive adolescent boys either in body height, body weight or in body mass index (BMI). We did not find statistical differences in the variables, body height, body weight and BMI between sports active and sports inactive adolescent girls in this research. Sports and physical activity are appropriate for all boys and girls without regard to body height, body

weight and BMI. Everyone can find their own place in sports and exercise, and it does not matter if it is on an organized or recreational base. Researchers, Vella, Cliff, Okely, Scully and Marley (2013) in their study wrote the same in their study: „*Organized sports are not solely for individuals of a healthy weight.*“ The same thoughts are determined in Brown, Patel and Darmawan (2017) who concluded that sports participation should be encouraged, and sports participation should be individualized to the developmental stage, maturation and personal interests and abilities of adolescents.

Boys were more satisfied with their body size than girls. Most satisfied with the body size in our research were sports active boys, followed by sports inactive boys, sports active girls, and sports inactive girls.

Gender and sporting activity can be predictors of satisfaction or dissatisfaction with one's own body size.

We found that an inaccurate perception of adolescent boys' and girls' own body is the issue nowadays. Body dissatisfaction is not limited to one gender. Dissatisfaction with one's body is manifested among adolescent boys and girls. We found a certain discrepancy in the perception of the real body and the image of an ideal body. Girls (63.6%) were more dissatisfied than boys (52%). The direction of dissatisfaction is not the same for boys and girls, because boys wanted to be bigger (more robust) in their own body and girls on the contrary wanted to be smaller (thinner) in their own body. The same results are in the research of Furnham, Badmin and Sneade (2002) who confirmed that as predicted, boys were as likely to want to be heavier as lighter, whereas very few girls desired to be heavier.

In the study of Chovancová, Peráčková (2016) we found the differences between real BMI and perceived body-size. From the results of this research, we can say that from all of girls (n=90) only 22 girls (24.4%) were seen to have a body approximately the same range as their real BMI. The test of a good match – chi square not confirmed 1 % or 5 % level of statistics significance. Authors (ibid) found differences between real BMI and perceived body size, 72 % of girls aged 15-16 years and 63 % of girls aged 17-18 years tend to have underestimated the self-perception of their BMIs than their real BMIs were.

The research sample from Saudi Arabia in the Al-Otabi, Nassef and Raouf (2013) study demonstrated very similar results in body dissatisfaction as in our research. From their research (ibid) it is known that most of students (65% compared to our 84%) had normal BMI, more males than females were overweight, and more females were underweight, and females had higher body shape dissatisfaction (33.5%) than males (21.4%). In comparison to our research, we found the similarity with research of Al-Otabi, Nassef and Raouf (2013) where more boys than girls were overweight 3.1% to 2.2%. But in our research, there were more boys underweight (6.9%) than girls (3.8%). More girls were dissatisfied with the body size (63.6%) than boys (52.1%). In both groups (boys and girls), the amount was more than half of the participants. The differences in comparison between real and perceived body size from the silhouettes rating scales in the direction to a higher estimation of one's own perception of the body were also found in the research of Brener, Eaton, Lowry and McManus (2004) and Faragas, Radu, Rus (2015). The likelihood of higher perceived-weight status was found more for females than for males in the study of Pritchard, King and Czajka-Narins (1997) who examined the relationship between body mass index (BMI) of adolescents and their perceived-weight status and self-concept. In gender-related body image attitudes, Muth and Cash (1997) found that women had a more negative body image evaluation in comparison to men. The same results were found in the study of Petroski, Pelegrini and Glaner (2009) who, according to their research report among 629 adolescent youth, found that the boys wanted to increase their body size (41.3%), and girls wanted to reduce their body size (50.5%). Overall, men's perception is more realistic than women's. Women feel the pressure of losing weight and it makes them dissatisfied (Fallon and Rozin 1985). In their study (ibid), both men and women err in estimating. For women the current figure was heavier than ideal figure and for men were almost identical.

The girls were less satisfied with their bodies than boys were with theirs according to Mäkinen, Puukko-Viertomies, Lindberg et al. (2012) with the statistical difference ( $p < .001$ ). In the same study, the girls expressed most satisfaction with their bodies when they were underweight, more dissatisfaction when they were of normal weight and most dissatisfaction when they had excess body weight. The boys also expressed most

satisfaction when they were underweight and most dissatisfaction when they had excess body weight. Researchers Ansari, Clausen, Mabhala and Stock (2010), Fox and Corbin (1989), and Swartz and Brownell (2004) pointed out that the female population perceives its body more negatively than the male population. Female showed more dissatisfaction with the body. The findings of Alwan, Viswanathan, Paccaud and Bovet (2011) emphasized the importance of social and cultural factors related to the accurate perception of one's own weight and appropriate weight control behavior in youth, which included nutrition and healthy lifestyle. Body image dissatisfaction had approximately 60.1% of students from Latiff, Muhamad and Rahman (2018) study and it represented a statistical significance ( $p < .001$ ), which was associated with sex and Body Mass Index (BMI). Females had 2.07 times higher rates of body image dissatisfaction compared to their male counterparts. Overweight/obese students had 4.06 times greater body image dissatisfaction compared to students with normal BMI. In our research we identified 57.5% of adolescent boys and girls dissatisfied with their body size. Substantial proportion of Seychelles students had an inaccurate perception of their weight and/or inappropriate weight-related behavior (Alwan, Viswanathan and Paccaud, Bovet 2011). The results of Probst, Van Copenolle and Vandereycken (1997) indicate that the negative body attitude is related to other signs of the negative body experience. The relationship between body satisfaction and BMI 5 years later in overweight adolescent girls found that girls with higher satisfaction gained less weight (van den Berg and Neumark-Sztainer 2007). Potential prospective risk factors for being dissatisfied with the body in the groups of adolescent boys and girls included body mass index, socioeconomic status, ethnicity, parent dieting, peer environment, and psychological factors (Paxton, Eisenberg and Neumark-Sztainer 2006). In a comparison of sex differences in the relationships between body dissatisfaction, Griffiths, Hay, Mitchison et al. (2016) wrote that it is associated with impairment in women's quality of life (QoL). For this argument they conducted research among 966 males and 1031 females living in Australia. The authors found that for both sexes, increasing levels of body dissatisfaction were associated with poorer mental and physical health-related QoL and greater psychological distress. They found that high levels of body dissatisfaction may threaten the

psychological and physical wellbeing of both men and women. The results of this path analyzed in a research article of Rukavina and Pokrajac-Buljan (2006) showed that social pressure from family and peers, experience of weight-related teasing and criticism by family members, contributed to development of eating disturbance.

One of the objectives of Šrámková and Cakirpaloglu (2015) was the creation of a new schematic scale of women and men which removes the limits of scales used up to now. The scale consists of ten schematic, very successfully drawn figures and is acceptable from the point of view of methodology and research and aesthetic figural portrayal. The name of the schematic scale is derived from the town of the employer's location (Czech town Olomouc) where it came into existence – Basic Olomouc Body Rating (abbreviated as BOBR). Development of a body dissatisfaction scale assessment tool was the aim of Mutale, Dunn, Stiller and Larkin (2016) who, offering both male and female versions of the bodies with improved realism and consistency between images and with the test-retest reliability, confirm the stability of the scale over a 5-week period.

Body dissatisfaction predicted restrictive eating practices, and eating disorders (Hawkins, Richards, Granley and Stein 2004; McDonald and Thomson 1992; Cattarin and Thompson 1994; Probst, Pieters and Vanderlinden 2008; Cooper, P. J., Taylor, Cooper, Z. and Fairburn 1987; Hausenblas and Fallon 2002; Cash and Deagle 3<sup>rd</sup> 1997; Irving 1990). Hausenblas and Fallon (2002) and Al-Otabi, Nassef and Raouf (2013) concluded that BMI was the strongest positive predictor of body dissatisfaction and social physique anxiety.

Authors Guo, Wu, Chumlea and Roche (2002) with the logistic models predicted adult overweight and obesity at the 75<sup>th</sup>-95<sup>th</sup> percentiles on the children and adolescent BMI charts. A child or adolescent with high BMI percentile on the national BMI-for-age growth charts has a high risk of being overweight or obese at 35 years of age and the risk increases with age. There is 20-59.9% probability of adult obesity in men older than 17 years when the percentiles in childhood and adolescence is at 85<sup>th</sup> percentile and 40-59.9% in women older than 18 years. Looking at our research sample, there are 23.21% of sports inactive boys at the risk of overweight or obesity in adult age, 19.47% sports active boys, 17.24% of sports active girls and 9.38%

sports inactive girls who are in the range of the 75<sup>th</sup>-95<sup>th</sup> percentiles on the national BMI-for-age growth charts. It means 17.5% of adolescents (with the BMI percentiles mean 82.98) from our sample are at the risk of being overweight or obese in adult age according to Guo, Wu, Chumlea and Roche (2002).

In comparison with Patrick, Norman, Calfas et al. (2004) whose main outcome measure from the Centers for Disease Control and Prevention body mass index-for-age percentiles is that they divided adolescents into two categories: first category – normal weight (<85th percentile) and second category – at risk for overweight plus overweight ( $\geq$ 85th percentile) we found out that from our sample belonging in the second category according to Patrick, Norman, Calfas et al. (2004) 7.14% of sports inactive boys (with the percentiles mean 92 in sports inactive boys), 5.75% of sports active girls (with the percentiles mean 89 in sports active girls), 5.31% of sports active boys (with the percentiles mean 90.83 in sports active boys), and 3.13% of sports inactive girls (with the percentiles mean 91 in sports inactive girls), which means 5.31% of adolescents with the percentiles mean 90.59 for adolescents.

The weight is not the theme for discussion for girls. For weights concerns, it should be discussed with the understanding, and in a sensitive, non-offensive way and non-stigmatizing manner. The girls are highly sensitive to criticism and they try to drive for thinness by dieting when they are dissatisfied with their own bodies. The period of adolescence is very important for optimal nutritional intake because of rapid physical and psychological development.

The order, from the greatest satisfaction with body parts to the lowest satisfaction in sports active boys and sports inactive boys is not equal in all ranks of these two groups from the research sample (Table 3.14). We present the order for both groups of boys – sports active and sports inactive (in the brackets): 1. Body height satisfaction (Body height satisfaction); 2. Hair satisfaction (Hair satisfaction); 3. Lower body part satisfaction (3.-4. Lower body part satisfaction – Middle body part satisfaction); 4.-5. Face satisfaction – Satisfaction with the whole body (5. Face satisfaction); 6. Middle body part satisfaction (Satisfaction with the whole body); 7. Body weight satisfaction (Upper body part satisfaction); 8. Upper body part

satisfaction (Body weight satisfaction); 9. Muscle tone satisfaction (Muscle tone satisfaction).

The order, from the greatest satisfaction with body parts to the lowest satisfaction in sports active girls and sports inactive girls (in the brackets) is: 1. Body height satisfaction (Satisfaction with the whole body); 2.-3. Equal: Hair satisfaction and satisfaction with the whole body (2. Body height satisfaction, 3. Hair satisfaction); 4. Upper body part satisfaction (Upper body part satisfaction); 5. Face satisfaction (Face satisfaction); 6. Body weight satisfaction (Body weight satisfaction); 7. Muscle tone satisfaction (Muscle tone satisfaction); 8. Middle body part satisfaction (Middle body part satisfaction); 9. Lower body part satisfaction (Lower body part satisfaction). The order is the same beginning from the third rank (Table 3.14).

In 2009, the simple idea was realized in *Elle* magazine that a woman is beautiful in her own way, in her natural beauty, in her common appearance and placed three well-known women who were completely without makeup and greasepaint on the cover of the May issue. The three well-known women were: Monica Bellucci – an Italian actress, Eva Hercigova – Czech top model, and Sophie Marceau – a French actress and they were photographed in their natural beauty. The photos on the cover were made by the famous photographer Petr Lindbergh. The research conclusions of Campbell (2014) suggest that advertisers and traders, as well as the publishing and fashion industries, should be more aware of their duties to social responsibility. Specifically, advertisers can avoid contributing a negative impact on the readers by suspending the use of ultra-slim models in their campaigns. In addition, it is generally recommended that fashion industries employ and subsequently publish in the magazines, female models of different sizes to better represent the diversity of female bodies. The trend of depicting natural female bodies is also underscored by women with rounded shapes on the covers of *Elle* magazine. The November 2013 cover shows Melissa McCarthy (famous actress e.g., from *Gilmore Girls*), the September 2010 cover shows Gabourey “Gaby” Sidibe (dark-skinned actor of movie *Precious*), both women are very beautiful in their own bodies.

Our research has shown some discrepancies in eating concerns and eating habits between girls and boys and between sports active and sports inactive boys and girls.

Gender but not sporting activity is a better predictor of having some eating concerns. Gender and sporting activity can be predictors of discrepancies in eating habits.

Boys rarely if ever felt guilty after eating, loved when their stomachs were empty, avoid eating even when they were hungry, were afraid about weight gain, and they rarely or never went the day without eating. Girls rarely if ever ate fast food and loved when their stomachs were empty. There were several statistical differences between eating patterns in sports active and sports inactive boys and sports active and sports inactive girls (written above in text). There were found statistical differences in eating breakfast and dinner between sports active and sports inactive boys. Breakfast and dinner were eaten more often in sports active boys than in sports inactive boys. Differences were found in the use of pills and diet to lose weight between considered groups. The adolescent eating habits were studied because many eating disorders appear soon after puberty and persist through secondary school years (Furnham, Badmin and Sneade 2002). Men and women showed comparable degrees of body dissatisfaction but in very different and predicted directions (Furnham and Calnan 1998). The findings of Furnham, Badmin and Sneade (2002) showed that approximately equal numbers of boys wanted to be heavier (37%) as wanted to be thinner (43%), whereas only 8.0% of the girls wanted to increase their weight. In our research, we had 36.7% of boys who wanted to increase their weight, 47.92% did not want any change and 15.38% wanted to be thinner. 7.24% of the girls from our research wanted to increase their weight, 56.3% wanted to be thinner and 36.42% did not want any change.

Bad eating habits are presented in the Slovakian study of Ochaba, Patoprstá, Rovný et al. (2018), which revealed that almost 40% of Slovakian children did not regularly have breakfast and 17.2% of them did not have breakfast at all. Males and females involved in weight-related sports ate breakfast more frequently than non-sports-involved peers (Croll, Neumark-Stainer, Story et al. 2006). 95% of Slovakian children had lunch regularly, and the number of children without lunch increased with the age (Ochaba,

Patoprstá, Rovný et al. 2018). Australian adolescents who reported >210 min./week of organized sports participation were more likely to report compliance with national fruit and vegetable consumption guidelines than those who participated in only <60 min./week (Vella, Cliff, Okely, Scully and Marley 2013).

Balanced daily nutritional intake was presented by Skerrett and Willett (2010) in their healthy eating pyramid, which also offers a good visual reminder of healthful eating. The first requirement for healthy nutrition is the variety of products that have to be eaten. Health behavior in eating habits include vegetable and fruit eating, regularity in eating, not eliminating daily meals, enough drinking water or tea without sugar. The European Union tends to reduce sugar in sweetened drinks. Media should pay attention to how to present and communicate the requirements of healthy nutrition and exercise, because the results of Irving (1990) and her study suggested that media has an impact on women's self-evaluations regardless of their level of bulimic symptoms.

We found that sports active boys had higher values for exercise motives than sports inactive boys in all presented motives. The order of importance and strength of exercise motives for sports active boys is: strength and endurance, positive health, appearance, nimbleness, enjoyment and weight management. The order of the strength of exercise motives for sports inactive boys is: strength and endurance, positive health, nimbleness, appearance, enjoyment and weight management. The order of importance and strength of exercise motives for sports active girls is: positive health, strength and endurance, appearance, enjoyment, nimbleness and weight management. The order of the strength of exercise motives for sports inactive girls is the same as for sports active girls. The results in the McDonald and Thompson (1992) article indicated that women's motivation for exercise was more often related to weight and tone reasons than men. In addition, for both genders, exercising for weight, tone, and attractiveness reasons was highly with other measures of disturbance. Exercising because of health was positively associated with self-esteem for both sexes (Ingledew and Markland 2008). In Slovenia most students were engaged in unorganized sports activities (Cerar, Kondrič, Ochiana, Sindik 2017). For male students, dominant participation motives were enjoyment, strength and

endurance. For female students, those were: weight management, positive health, appearance and nimbleness. From our research it is not the same as for boys and girls. When the family's orientation is toward sporting activities it is more likely that also the children from these families will be active in sports.

The conclusion is, promoting physical activity in youth is desirable (Biddle, Gorely and Stensel 2004). The role of sports is important for healthy life, and an energy balanced expenditure for sustainable healthy weight. Intervention to reduce sedentary activities among adolescent girls are best to focus on weekend behavior (Hardy, Bass and Booth 2007). In our opinion, the password should be: *“Open the gates of school facilities for the use of children and the inhabitants of the closest neighborhoods – and support the community life”*.

Worth talking about is that some recent initiatives have adopted an integrated approach to prevention of weight-related problems – body dissatisfaction, being overweight, obesity and eating disorders (Sánchez-Carracedo, Neumark-Sztainer and López-Guimerà 2012). First, to optimize current and future health, all young people should participate in physical activity of at least moderate intensity for 1 hour per day (Cavill, Biddle and Sallis 2001).

## CONCLUSION

We observed body satisfaction or body dissatisfaction, concerns about eating, eating habits and exercise motives among boys and girls, and among sports active and sports inactive boys and girls. Gender and participation in sporting activities and physical exercises is associated with some results of our research of satisfaction or dissatisfaction with the body size, eating concerns and eating habits and motives for exercising.

Body image is the topic which has captured enormous interest during past 30 years. More boys than girls are involved in sports active living. Sports active boys are more satisfied with body size than sports inactive boys, sports active girls, and sports inactive girls. We identified that more boys than girls were satisfied with their body size and did not want to make

any change (47.9% of boys and 36.4% of girls). Surprisingly more sports inactive boys (51.8%) than sports active boys (46%) did not want any change in their own body size. Almost the same percentage of sports active and sports inactive girls (36.8% and 35.8%) did not want any change in their body size. The highest satisfaction in boys and in girls was with the body height and hair. On the end of the satisfaction order was in boys' satisfaction with muscle tone and in girls the satisfaction with the lower body. The boys were more satisfied with that part of their bodies than girls. The sports active boys were statistically significantly more satisfied in body weight satisfaction compared to sports inactive boys and sports active girls. We did not find out any statistical differences in satisfaction with selected body features between sports active and sports inactive girls.

Girls had 4.5% more eating concerns than boys when thinking about feelings before and after eating. And girls were more disciplined than boys in eating daily meals during the last 28 days before research. There were several statistical differences between the eating patterns in sports active and sports inactive boys and sports active and sports inactive girls (results are above in text). Girls tended more often than boys to use pills or dieting to lose weight. In comparing sports active and sports inactive boys there were no statistical differences found. In a comparison of sports active and sports inactive girls we found statistical differences in using diet to lose weight. More sports active girls than sports inactive girls used diet to lose weight.

The order of the five strongest personal statements for girls in exercise motives is: 1. To have a body in good form. 2. To feel healthier. 3. To have a healthy body. 4. Enjoyment of the experience of exercising. 5-6. To maintain good health and to increase endurance (the same height of values). For boys it is not the same order, but this: 1. To increase endurance. 2. To look nice. 3. To develop muscles. 4. To have a healthy body. 5. To become more flexible. On the other end of the order for girls it is the statement that they exercise to lose weight and on the end of statements' order for boys it is the statement that they exercise to stay slim.

Physical activity involvement in the day-to-day mode of youth is one of the most important conditions for a healthy lifestyle. The main requirements are that the activities should be regular, systematic and habitual.

Gender and physical activity can be predictors of satisfaction or dissatisfaction with body size, eating concerns, eating habits and exercise motives.

Society should develop strategies that promote health-related physical activity and promote positive and active lifestyle patterns particularly among adolescents. The pattern of behavior that becomes common in adolescents is easier to transfer to later stages of life. What is learned at a young age may seem as if you found it at a later age. From the government decision more programs should be ensured in media about the positive effects of physical activities – not only top-level sports but recreational leisure time physical activities. All gender and age categories, not only adolescents, should make a balance between physical activity and sedentary behavior in daily life. Researchers should try to find the mechanism of how to succeed in the research of brain structures' functioning, that the motion is the equal real biological need as sleep, hunger and thirst and when there is no saturation, then the body is in big discomfort and must find the possibility of how to come in comfort – be in motion.

Nutritional and eating habits, and physical activity are not the sole responsibility of individual separate families. There is a need for state politics to create an environment of knowledge, material conditions, activities and positive experiences. Not only for promotion but to put into practice a necessity these days in the era of sedentary behavior.

### **Limitations of the Study**

With the limitation of the study, we considered the sample size: we worked only with samples with which we had completed questionnaires. If we had access to a more representative sample, then maybe we would have more precise results and we could generalize the results to a larger population. We will continue with this research and we will try to gain more respondents from other parts of the Slovak Republic, not only from the capital city. The second limitation of the study should be the self-reported data, because we gathered responses at the moment in time, when the person, in any mood, perceives the question and answered the question in a subjective manner. To overcome this, there should be some introductory and

motivational parts with the research leader before respondents start filling out the questionnaire. The third limitation could be that we did not determine the kind of sports in which participants were involved. Maybe we would find much new information, such as which kind of sports has the greatest effect on the satisfaction with the perception of one's own body, eating habits and exercise motives. This approach would require a larger sample size.

### **Practical Implications**

Our results provide evidence that sports and exercising have a positive influence on the perception of one's own body and eating habits. The motivation for sports participation should be gender-focused.

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### **Conflicts of Interest**

There were no conflicts of interest.

Ethical consent (1/2019) has been obtained from the Ethical Commission of the Faculty of Physical Education and Sport, Comenius University in Bratislava, Slovak Republic.

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### ***BIOGRAPHICAL SKETCHES***

***Assoc. Prof. PaedDr. Janka Peráčková, PhD.***

#### **Affiliation:**

Comenius University in Bratislava, Faculty of Physical Education and Sport, Department of Sport Educology and Sport Humanities

#### **Education:**

2016: Study: Statistical Methods: Statistical Analysis of data in practice – from concepts to interpretation of the results (one semester/half a year)  
2001: Study: Management of Lifelong education (one semester/half a year)

1995-1997: University of Cambridge, Local Examinations Syndicate – study English language – First Certificate in English (FCE)

1977-1982 Comenius University in Bratislava, Faculty of Physical Education and Sport (as a Physical Education and Geography Teacher – the second-best student from the 158 finishing students in the year 1982). Graduated with honors (red diploma) and with the title PaedDr. (Doctor of Pedagogy) and with the Rector's Award for excellent study results, scientific and research activities and social commitment.

1970-1975 State language school in Poprad – English language

1976-1977 High school in Bratislava (Grammar school)

1973 -1976 High school in Poprad (Grammar school)

**Business Address:**

Comenius University in Bratislava  
Faculty of Physical Education and Sport  
Department of Sport Educology and Sport Humanities  
Nábr. arm. gen. L. Svobodu č. 9  
814 69 Bratislava  
Slovak Republic  
EUROPE

**Research and Professional Experience:**

The educational subjects taught by the author at the Faculty of Physical Education and Sport:

**In bachelor and master study:**

Pedagogical communication,  
Pedagogical diagnostics,  
Rhetoric and communication,  
Didactics of school Physical Education,  
Didactics of educational process with Physical Activities,  
Teacher training,  
Movement programs for preschool children,

Bachelor's thesis seminar,  
Master's thesis seminar.

In PhD. Study:  
Problem pupils,  
Communication in sport,  
Management of professional teacher development

In Erasmus study program:  
Pedagogical communication,  
Pedagogical diagnostics,  
Didactics of school Physical Education,  
Didactics of educational process with Physical Activities,  
Teacher training

In Coach Education for Sport Associations and Federations:  
Foundation of Pedagogy  
Sport Pedagogy and Theory of Education

Guarantee:  
Bachelor's teacher course,  
Master's teacher course

Chair of:  
Chair of the Commission for the state exams in Bachelor's Degree for  
Physical Education teachers' education.

Chair of the Commission for the state exams in Master's Degree for  
Physical Education teachers' education.

Chair of the Commission for the rigorous exams to earn the title Doctor  
of Pedagogic (PaedDr.)

2004-2005 member of the experts' group of the general director of the  
Department of State Care for Sport of The Ministry of Education of the  
Slovak Republic for the elaboration of the Concept of Education in Sport.  
Co-author of the Unified Education System for Sports Professionals.

Member of research teams in 2 European scientific researches (1995 – 1997 – 6 European countries; 2004 – 25 European countries – project VOCASPORT)

Member of research teams in 19 national scientific researches.  
Head of the research teams in 2 national scientific researches.

Author and co-author more than 160 published scientific and professional papers, books, both at home and abroad.

**Professional Appointments:**

1985 – until today:

Comenius University in Bratislava, Faculty of Physical Education and Sport.

2007- until today:

Associate Professor at the Comenius University in Bratislava, Faculty of Physical education and Sport, Department of Sport Educology and Sport Humanities.

2007-2018:

11 years the Head of Department of Sport Educology and Sport Humanities.

1985-2007

Senior lecturer at the Department of Sport Educology

2001.01.01. – 2002.06.30.:

Director of Department of Education, Science and Research at National Sport Centre, Ministry of Education, Science, Research and Sport.

1985.01.01. – 1987.08.31.

Expert for research in School Physical Education at Research Institute of Physical Culture at the Faculty of Physical Education and Sport, Comenius University.

1982.08.25. – 1985.12.31.

Teacher of Physical Education and Geography at Primary School, Prechtlova Street, Bratislava.

**Honors:**

1982: Rector's Award for excellent study results, scientific and research activities and social commitment.

2013: A letter of Thanks from Rector of Comenius University to outstanding university teacher for significant contribution to the scientific, artistic and professional achievements of Comenius University students.

2008-2019:

8-times Rector's Award for the thesis supervisor for outstanding master thesis.

6-times Dean's Award for the thesis supervisor for outstanding bachelor thesis.

**Publications from the Last 3 Years:****2019:**

Peráčková, J. and Peráček, P. (2019). Sport for the Subjective Dimensions of Quality of Life. In *Quality of Life: Biopsychosocial Perspectives*, edited by Floriana Irtelli, (45 p). London: IntechOpen. ISBN 978-1-78985-208-0. doi: 10.5772/intechopen.88209. [In Press for the year 2019].

**2018:**

Peráčková, J., Kukurová, K., Šmela, P., Pačesová, P. and Plevková, L. (2018). Appearance-management behaviors in Thai and Slovak women and men. *International Journal of Arts, Humanities and Social Sciences*, 3(4):14-22.

Peráčková, J., Chovancová, A., Kukurová, K. and Plevková, L. (2018). Self-evaluation of body image in sport active and sport inactive adolescent girls. *Acta Gymnica*, 48(3):109-114. doi: 10.5507/ag.2018.014.

Peráček, P. and Peráčková, J. (2018). Tactical preparation in sport games and motivational teaching of sport games tactics in physical education lessons and training units. In *Sport Pedagogy: Recent approach to technical-tactical alphabetization*, edited by Jaime Serra Olivares, pp. 3-31. London: IntechOpen. doi:10.5772/intechopen.75204.

Peráčková, J. (2018). Didaktická interakcia – komunikácia motivácie. [Didactic interaction – communication of motivation.] In *Inovatívne*

*trendy v odborových didaktikách v kontexte požiadaviek praxe*. pp. 46-54. Nitra, Slovakia: University of Constantine Philosopher, Pedagogical Faculty. [Paper presented at the conference *Innovative trends in special didactics in the context of practice requirements*, Nitra, Slovakia, November 13, 2017. pp. 46-54. Nitra, Slovakia: University of Constantine Philosopher, Pedagogical Faculty.]

- Plevková, L., Peráčková, J., Pačesová, P., Kukurová, K. and Mókušová, O. (2018). The effects of a 6-week strength and endurance circuit training intervention on body image in Slovak primary school girls. *Journal of Physical Education and Sport*, 18(1 Supplement issue): 459-464, Art. No. 64. doi: 10.7752/jpes.2018.s164.
- Nemček, D., Kraček, S. and Peráčková, J. (2018). Rosenberg self-esteem scale analyses among elite and competitive athletes, recreational athletes and inactive individuals. *Journal of Physical Education and Sport*, 17(5 Supplement issue): 2305-2310; Art. No. 249. doi: 10.7752/jpes.2017.s5249.

**2017:**

- Peráčková, J. and Fába, O. (2017). Motivácia k tancu u návštevníkov tanečnej školy Riverpark dance school. [Motivation to dance of male participants in dance school Riverpark Dance School.] In *Nové poznatky v gymnastike, tancoch, úpoloch, fitness a silových športoch*. pp. 80-85. Bratislava, Slovakia: Comenius University, Faculty of Physical Education and Sport. [Paper presented at the conference of *New scientific knowledge in gymnastics, dances, martial arts, fitness, and strength sports*, pp. 80-85. Bratislava, Slovakia: Comenius University, Faculty of Physical Education and Sport.]
- Peráčková, J. and Janžová V. (2018). Diferencie v motivácii k tancu medzi chlapcami a dievčatami základnej školy. [Differences in motivation to dance between primary school boys and girls.] In *Nové poznatky v gymnastike, tancoch, úpoloch, fitness a silových športoch*. pp. 86-91. Bratislava, Slovakia: Comenius University, Faculty of Physical Education and Sport. [Paper presented at the conference of *New scientific knowledge in gymnastics, dances, martial arts, fitness, and strength sports*, pp. 86-91. Bratislava, Slovakia: Comenius University, Faculty of Physical Education and Sport.]

**2016:**

- Peráčková, J. and Peráček, P. (2016a). Body Image športujúcich a nešportujúcich adolescentov. [Body Image of adolescent athletes and nonathletes.] In *Telesné sebaopínanie školskej športujúcej a nešportujúcej populácie. [In: Physical Body Self-perception of school athletes and nonathletes population.]* Edited by Janka Peráčková, pp. 6-136. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4244-5.
- Peráčková, J. and Peráček, P. (2016b). Antropometrické charakteristiky športujúcich a nešportujúcich žiačok z vybraných stredných škôl zo Slovenska. [Anthropometric characteristics of sport active and sport inactive female pupils from selected secondary schools from Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.]* Edited by Janka Peráčková, pp. 8-161. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Pintérová, Z. and Peráčková J. (2016). Vplyv zážitkového učenia s obsahom pohybových aktivít na úroveň sebahodnotenia školskej úspešnosti žiakov s poruchami správania. [The influence of experiential learning with the content of physical activities on the level of self-evaluation of school success in pupils with behavioral disorders.] *Telesná výchova a šport*, 26(1):3-7. [*Physical Education and Sport*, 26(1):3-7.]
- Chovancová, A. and Peráčková, J. (2016). The differences in comparison of real body mass index and perceived body size among adolescent girls from selected secondary school. *Acta Facultatis Educationis Physicae Universitatis Comenianae*, 56(1):65-76. doi: 10.1515/afepuc-2016-0006.
- Kaplanová, A., Peráčková, J. Pintérová, Z. (2016). Rodové diferencie v sebahodnotení žiakov s ADHD a ich význam pri formovaní sociálneho statusu žiaka v školskej triede. [Gender differences in self-evaluation of ADHD pupils and their importance in forming pupil's social status in school class.] *E-mental*, 4(1):6-9.
- Plevková, L. and Peráčková, J. (2016a). Vplyv aerobiku na percepciu subjektívnej pohody žiačok strednej školy. [The influence of aerobic on perception of subjective well-being in secondary school female pupils.]

- In *Telesné sebaopímanie školskej športujúcej a nešportujúcej populácie*. [In: *Physical Body Self-perception of school athletes and nonathletes population*.] Edited by Janka Peráčková, pp. 137-148. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4244-5.
- Plevková, L. and Peráčková, J. (2016b). Rozdiely v telesnej výške športujúcich a nešportujúcich žiakov z vybraných gymnázií z Bratislavy a z iných oblastí Slovenska. [Differences in body height of sport active and sport inactive pupils from selected high school from Bratislava and other areas of the Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík*. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.] Edited by Janka Peráčková, pp. 162-175. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Plevková, L. and Peráčková, J. (2016c). Rozdiely v telesnej hmotnosti športujúcich a nešportujúcich žiakov z vybraných gymnázií z Bratislavy a z iných oblastí Slovenska. [Differences in body weight of sport active and sport inactive pupils from selected high school from Bratislava and other area of the Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík*. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.] Edited by Janka Peráčková, pp. 176-186. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Plevková, L. and Peráčková, J. (2016d). Rozdiely v Body Mass Indexe a Rohrerovom Indexe športujúcich a nešportujúcich žiakov z vybraných gymnázií z Bratislavy a z iných oblasti Slovenska. [Differences in Body Mass Index and Rohrer Index of sport active and sport inactive pupils from selected high school from Bratislava and other area of the Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík*. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.] Edited by Janka Peráčková, pp. 187-200. Bratislava,

- Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Kukurová, K. and Peráčková, J. (2016a). Telesná výška, telesná hmotnosť a Body Mass Index žiačok z vybraných základných škôl na Slovensku. [Body height, body weight and Body Mass Index of primary school female pupils from Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.]* Edited by Janka Peráčková, pp. 201-212. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Kukurová, K. and Peráčková, J. (2016b). Pohybová aktivita žiačok z vybraných základných škôl zo Slovenska. [Physical activity of female pupils from selected primary school from Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristík. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.]* Edited by Janka Peráčková, pp. 213-222. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Petrášová, B., Vargová, A., Rychtáriková, H., Peráčková, J. and Rychtáriková, M. (2016). Challenges in teaching of foreign language pronunciation in nowadays classrooms. *Akustika*, 25(1):2-9.

**Assoc. Prof. PaedDr. Pavol Peráček, PhD.**

**Affiliation:**

Comenius University in Bratislava, Faculty of Physical Education and Sport, Department of Sport Games

**Education:**

1977-1982 Comenius University in Bratislava, Faculty of Physical Education and Sport (as a Physical Education and Geography Teacher – the

best student from the 158 finishing students in the year 1982). Graduated with honors (red diploma) and with the title PaedDr. (Doctor of Pedagogy) and with the Minister of Education's Award for excellent study results, scientific and research activities and social commitment.

1973-1977 High school in Nové Mesto nad Váhom

1989-1990 Football Coach education in Czechoslovak football Association, Prague

**Business Address:**

Comenius University in Bratislava  
Faculty of Physical Education and Sport  
Department of Sport Games  
Nábr. Arm. Gen. L. Svobodu č. 9  
814 69 Bratislava  
Slovak Republic  
EUROPE

**Research and Professional Experience:**

The educational subjects taught by the author at the Faculty of Physical Education and Sport:

Specializations Theory and Didactics of Football 1-10.

Theory and didactics of movement and sport games.

Didactics of Football

Bachelor's thesis seminar.

Master's thesis seminar.

Lecturer for the Doctoral study.

Guarantee – coach education.

The chairman of the final state exam commission for master study – collective sports.

1999-2004 member of the Accreditation Commission for Specialized Activities in Sport at the Ministry of Education Slovak Republic.

2004-2016 the chairman of the Accreditation Commission for Specialized Activities in Sport at the Ministry of Education Slovak Republic.

Co-author of the Unified Education System for Sports Professionals.

Co-author of the Decree on the Unified Education System for Sport Professionals, Decree on the education of Professionals in sport as a part of the Act on Sport Slovak Republic.

2004-2005 Chairman of the experts' group of the general director of the Department of State Care for Sport of The Ministry of Education of the Slovak Republic for the elaboration of the Concept of Education in Sport.

Since 2011 – member of the Scientific grant agency at the Ministry of Education, Science, Research and Sport Slovak Republic (for the granting of scientific funding).

Member of research teams in 17 national scientific researches.

Head of the research teams in 3 national scientific researches.

Author and co-author more than 250 published scientific and professional papers, books, both at home and abroad.

Professional coach activities:

18 years he leaded as a coach various national teams of Slovak republic in football (Slovak Republic women team, Slovak Republic women junior team, Slovak Republic U18, U19, U20) with the total number of starts 177 in international matches.

2009-2011

Coach Slovak Republic U19 – twice in Elite Round

1995-2002

Coach Slovak Republic women team

1993-1995

Coach of Slovak republic teams U18, U19.

1983-1992

Coach for juniors in SLOVAN CHZJD Bratislava.

2004-2010

Member of realization team of Slovak Republic men “A” team (World Cup 2010 in South Africa – Quarterfinal).

2003

Member of realization team of Slovak Republic men U20 team (World Cup 2003 – United Arab Emirates – 9<sup>th</sup> place).

2002

Member of realization team of Slovak Republic men U19 team (European Championship – Norway – 3<sup>rd</sup> place, bronze medals).

1999-2011 technical director at the Slovak Football Association.

2006-2015 technical instructor UEFA for Middle and East Europe.

**Professional Appointments:**

1982 – until today:

Comenius University in Bratislava Faculty of Physical Education and Sport.

1986- until today:

Department of Sport Games.

1983-1986:

Research Institute of Physical Culture at the Faculty of Physical Education and Sport, Comenius University in Bratislava

1982-1983:

Department of Sport Games.

2000 until today:

Associate Professor

1982-2000:

Senior lecturer

2014- until today:

The head of Department of Sport Games.

1993-2001:

The head of Department of Sport Games.

**Honors:**

1982 – Minister of Education of Slovak Republic Award for the excellent studying results, for outstanding academic achievement, scientific research and social commitment.

2016 – Dean's Award – Best Associate Professor of the Faculty of Physical Education and Sport, Comenius University in Bratislava for the results in the field of pedagogical, publishing and scientific research activities

10-times Rector's Award for the thesis supervisor for outstanding master thesis.

9-times Dean's Award for the thesis supervisor for outstanding bachelor thesis.

Silver medal of Slovak football Association

UEFA honorary Awards

**Publications from the Last 3 Years:****2019:**

Peráčková, J. and Peráček, P. (2019). Sport for the Subjective Dimensions of Quality of Life. In *Quality of Life: Biopsychosocial Perspectives*, edited by Floriana Irtelli, (45 p). London: IntechOpen. ISBN 978-1-78985-208-0. doi: 10.5772/intechopen.88209. [In Press for the year 2019].

Obetko, M., Babic, M. and Peráček, P. (2019). Changes in disjunctive reaction time of soccer goalkeepers in selected training load zones. *Journal of Physical Education and Sport: Supplement issue*. 19(2):420-426. doi:10.7752/jpes.2019.s2062.

Barilla, P., Tóth, I., Peráček, P. and Babic, M. (2019). Impact of Power plays' efficiency on ice hockey match results and team standings. *Journal of Physical Education and Sport*. 19(2):1053-1059. doi:10.7752/jpes.2019.02152.

**2018:**

- Peráček, P. (2018). Bratislava: *Teória športových hier*. Bratislava: Slovenská vedecká spoločnosť pre telesnú výchovu a šport. ISBN 978-80-89075-74-4. [*Sport Games Theory*. Bratislava: Slovak Scientific Society for Physical Education and Sport].
- Peráček, P. and Peráčková, J. (2018). Tactical preparation in sport games and motivational teaching of sport games tactics in physical education lessons and training units. In *Sport Pedagogy: Recent approach to technical-tactical alphabetization*, edited by Jaime Serra Olivares, pp. 3-31. London: IntechOpen. doi:10.5772/intechopen.75204.
- Peráček, P., Dragula, L. and Mikulič M. (2018). Účinnosť obsahového zamerania športového tréningu v prípravnom období futbalistov staršieho dorastu vo futbale. In: *Zborník vedeckých prác Katedry športových hier FTVŠ UK*; č. 25. 73-106. Bratislava: Slovenská vedecká spoločnosť pre telesnú výchovu a šport. [The Effectiveness of the content focus of Sports football training in the preparatory period of the older youth of footballers. In: *Proceedings of Scientific Works of Department of Sport Games, Faculty of Physical Education and Sport, Comenius University in Bratislava*, Vol. 25; 25-106. Bratislava: Slovak Scientific Society for Physical Education and Sport].
- Peráček, P., Bôžik, M. and Mikulič M. (2018). Internal load of elite Malaysian young soccer players in small sided games with different parameters. *Acta Facultatis Educationis Physicae Universitatis Comenianae*, 58(1):32-43. doi:10.2478/afepuc.2018-0004.
- Peráček, P., Šagát, P., Vajdík, T. and Mikulič, M. (2018). Standardization of selected control exercises for soccer technical evaluation. *Journal of Physical Education and Sport*, 18(2):745-752. doi:10.7752/jpes.2018.02109.
- Mikulič, M., Peráček, P. and Babic, M. (2018). Vplyv špecificky orientovaného program na herný výkon elitných mládežníckych hráčov vo futbale. In: *Zborník vedeckých prác Katedry športových hier FTVŠ UK*; č. 25. 116-133. Bratislava: Slovenská vedecká spoločnosť pre telesnú výchovu a šport. [The impact of specifically oriented program on the game performance of elite youth soccer players. In: *Proceedings of scientific works of Department of Sport Games, Faculty of Physical Education and Sport, Comenius University in Bratislava*, Vol. 25; 116-

133. Bratislava: Slovak Scientific Society for Physical Education and Sport].
- Peráček, P., Bôžik M. and Mikulič, M. (2018). Vybrané charakteristiky vnútorného zaťaženia elitných mladých futbalistov v prípravných hrách s rôznymi parametrami. *Studia Sportiva*, 12(2):79-86. [Selected characteristics of internal load of elite young footballers in preparatory games with different parameters. *Studia Sportiva*, 12(2):79-86]. doi: 10.5817/StS2018-2-8.
- Holienka, M., Peráček, P., Zapletalová, E., Mikulič, M., Babic, M. and Nagy, N. (2018). *Vybrané aspekty herného výkonu futbalistov U21*. Bratislava: Slovenská vedecká spoločnosť pre telesnú výchovu a šport. [Selected aspects of the game performance of football players U21. Bratislava: Slovak Scientific Society for Physical Education and Sport.]

**2017:**

- Peráček, P., Varga, K., Gregora, P. and Mikulič, M. (2017). Selected indicators of an individual game performance of a goalkeeper at the European championship among the 17-year-old elite football players. *Journal of Physical Education and Sport*, 17(1):188-193. doi:10.7752/jpes.2017.01028.

**2016:**

- Peráčková, J. and Peráček, P. (2016). Body Image športujúcich a nešportujúcich adolescentov. [Body Image of adolescent athletes and nonathletes.] In *Telesné sebaopínanie školskej športujúcej a nešportujúcej populácie*. [In: *Physical Body Self-perception of school athletes and nonathletes population*.] Edited by Janka Peráčková, pp. 6-136. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4244-5.
- Peráčková, J. and Peráček, P. (2016). Antropometrické charakteristiky športujúcich a nešportujúcich žiačok z vybraných stredných škôl zo Slovenska. [Anthropometric characteristics of sport active and sport inactive female pupils from selected secondary schools from Slovakia.] In *Úroveň telesného rozvoja školskej športujúcej a nešportujúcej populácie z hľadiska vybraných výskumných charakteristik*. [The level of physical development of school sport active and sport inactive population in terms of selected research characteristics.] Edited by

- Janka Peráčková, pp. 8-161. Bratislava, Slovakia: Comenius University in Bratislava. ISBN 978-80-223-4243-8.
- Benkovský, Ľ., Mikulič, M., Gregora, P. and Peráček, P. (2016). Efektívnosť športovej prípravy mladších žiakov vo futbale. [The effectiveness of younger pupils' sport training in football.]. *Studia Sportiva*, 10(1):117-128.
- Peráček, P., Mikulič, M. and Marko, K. (2016). Uplatnenie základného herného systému 4-3-3 proti systému 4-3-3 vo futbale 3. časť. [Application of the basic 4-3-3 game system against the 4-3-3 system in football, part 3.] *Telesná výchova a šport*, 26(2):40-41. [*Physical Education and Sport*, 26(2):40-41.]
- Peráček, P., Mikulič, M. and Marko, K. (2016). Uplatnenie základného herného systému 4-3-3 proti systému 4-3-3 vo futbale 4. časť. [Application of the basic 4-3-3 game system against the 4-3-3 system in football, part 4.] *Telesná výchova a šport*, 26(2):41-43. [*Physical Education and Sport*, 26(2):41-43.]
- Benkovský, Ľ., Mikulič, M., Gregora, P. and Peráček, P. (2016). Malé formy prípravných hier v etape základnej športovej prípravy futbalistov. [Small forms of preparation games in the period of initial sport preparation of footballers.] *Telesná výchova a šport*, 26(2):44-48. [*Physical Education and Sport*, 26(2):44-48.]