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ACTA UNIVERSITATIS MATTHIAE BELII PHYSICAL EDUCATION AND SPORT *(ISSN 1338-0974) je* vedecký časopis. Svojím obsahom je zameraný na prezentáciu pôvodných výskumných výsledkov a teoretických štúdií, ktoré sa vzťahujú k vedeckej problematike vied o športe. Redakcia uvíta všetky rukopisy spracované v tomto duchu.

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PREFERENCE OF WINTER SPORTS BY PRIMARY SCHOOL PUPILS IN BANSKÁ BYSTRICA AND DETVA

ADAMČÁK ŠTEFAN – KOZAŇÁKOVÁ ANNA

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SUMMARY

In this paper, we analyze the popularity image of winter sports in elementary school by pupils in districts of Banská Bystrica and Detva. Through the mean of a survey, we found out that in a group of boys winter as well as a summer sports are equally popular, but girls rather prefer winter sports. Furthermore, we found out that in a group of girls the most favourite winter sport is downhill skiing and snowboarding in a group of boys. On a positive note for us was the finding that almost every pupil has the opportunity to attend a winter camp of physical education within the school curriculum.

KEY WORDS: winter sports, primary school, pupils, popularity.

INTRODUCTION

Winter sports have their charm. Snowy ski slopes and pleasantly warm mountain sun, winter stadium with quality ice, which are full of people. Frozen streams and lakes simply belong to the winter and fall and offer a unique opportunity to enjoy the sports side of life. Winter sports and their media formats are a huge phenomenon of the 20th and 21st Century. As part of the winter cultural development a new phenomenon occurs, when a common man is gradually getting more leisure time. This time of course, he is trying to fill out somehow and here the various winter physical activities come in.

The winter season offers countless sporting activities. They include skiing, snowboarding, ice-skating, etc... All winter sports allow kinetic activity in natural conditions and a healthy environment.

If the parents alone prefer winter sports and if they have a good material background, the children encounter with skiing and snowboarding from early childhood. Many children, however, meet with professional teaching of skiing and snowboarding during the winter

course through the elementary school. Therefore, these courses for children are considered of high importance. They create a positive relationship to movement and improve their physical fitness. They introduce them to a stay in winter-nature Mountains, teach them proper relation to the environment, and provide basic ski, snowboard and hiking knowledge and skills (Paugschová – Kubaščík, 2002).

Many surveys carried out by the authors Michal (2006, 2002), Gorner – Starší (2001), Bartík (2009) suggest that physical education lessons focused on seasonal activities in collaboration with other thematic units for secondary schools are an optimal support to physical and movement development of children.

Implementation of outdoor movement and sport activities has a positive impact on the development and regeneration of physical but also mental strength of a person. It is clear to us that the inclusion of such activities must become an integral part of an individual's physical activity from early childhood and cannot be missing at school. The aim of teaching winter sports in schools should be looking for opportunities that will contribute to the improvement of quality and increase of interest in performing seasonal activities by teachers and pupils.

AIM

Analysing the popularity of winter sports in elementary school pupils in districts of Banská Bystrica and Detva.

METHODOLOGY

Our supporting research method was the method of a survey. Survey was distributed to the 8th and 9th grades pupils of primary schools in districts Banská Bystrica and Detva at the beginning of the second half of school year 2011/2012 - during the February (Figure 1).

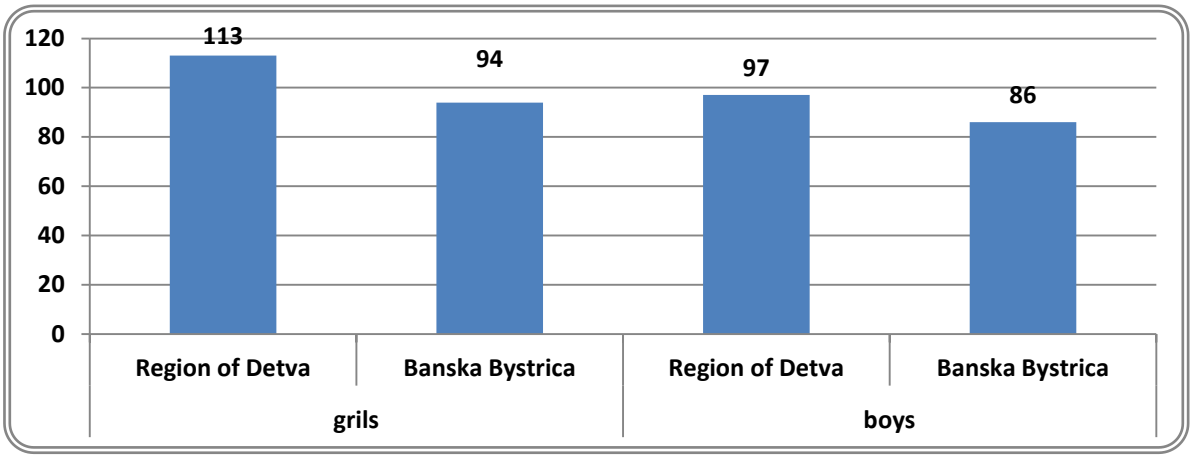


Figure 1 Exploratory file of pupils - the number

While completing the questionnaire they have been given proper instruction. Evaluation of the survey was carried out through the company TAP Gamo Banská Bystrica.

The results of pupil responses were analyzed in terms of intersex differences and also in terms of popularity of the physical education and sports subject.

RESULTS AND DISCUSSION

Opening issue of our survey was to find out whether school physical education and sport belongs among pupils to a popular subject. We found out that the subject is pretty popular among the majority of pupils - popularity was higher than 80 % (Figure 2). At the same time, we also found out that the subject is slightly more popular in the group of girls. This fact we consider very positive and in accordance with the research of Bartík - Mesiarik (2009), who in examining attitudes on a sample of 1,100 9th grade primary schools pupils of the Central Slovak region recorded a positive attitude towards school physical education, and that by 40,7% of pupils. Also, the results of Antal et al. (2012) suggest that physical and sport education is among most primary school pupils one of the most popular or favourite school subjects. Adamčák – Kozaňáková (2013) have found out while examining attitudes on a sample of 535 6th grade pupils of primary schools in Orava region that an indifferent approach towards the subject of physical education and sports dominates the pupils attitude – 67,91% of boys and 77,90% of girls.

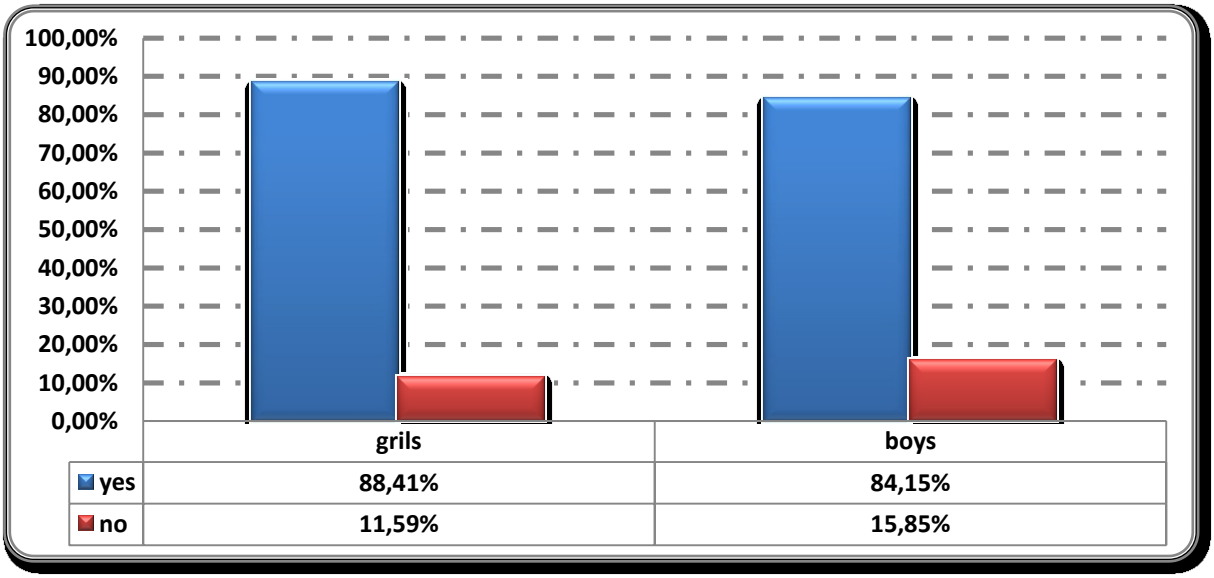


Figure 2 Popularity of the sports and physical education subject among pupils

From the perspective of intersex differences the responses were not statistically significant (Table 1).

Table 1 Statistical evaluation of the popularity of the physical education and sports subject among pupils

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	N	------

Legend: ♣ ♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05
N = not statistically significant

In terms of winter and summer sports preferences among pupils, we found out that among boys summer and winter sports are equally popular (Figure 3). In the group of girls, increased popularity was recorded in the group of summer sports.

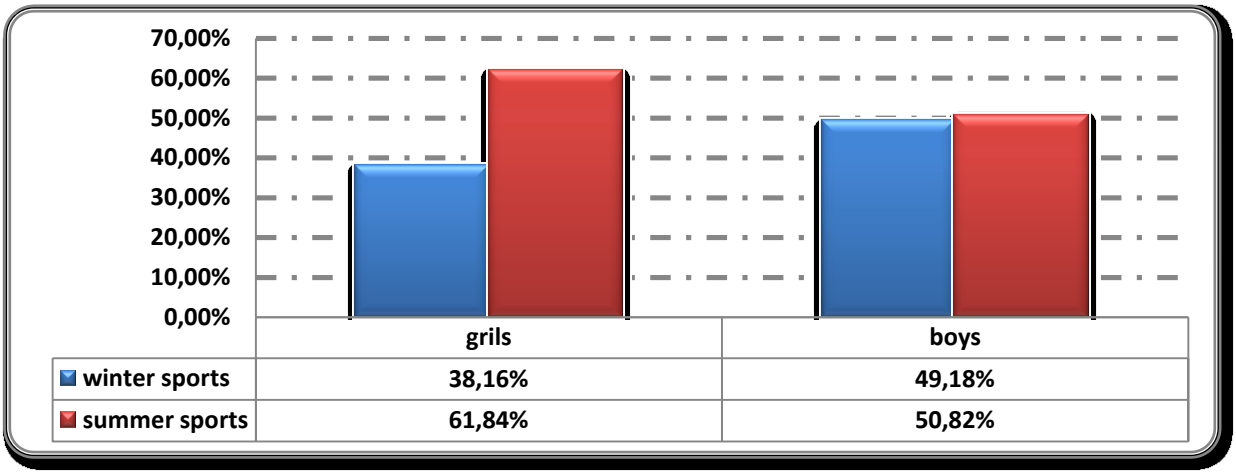


Figure 3 Preference of winter and summer sports among pupils

In evaluating this issue, we reported statistically significant differences in responses of pupils only from the perspective of intersex differences (Table 2).

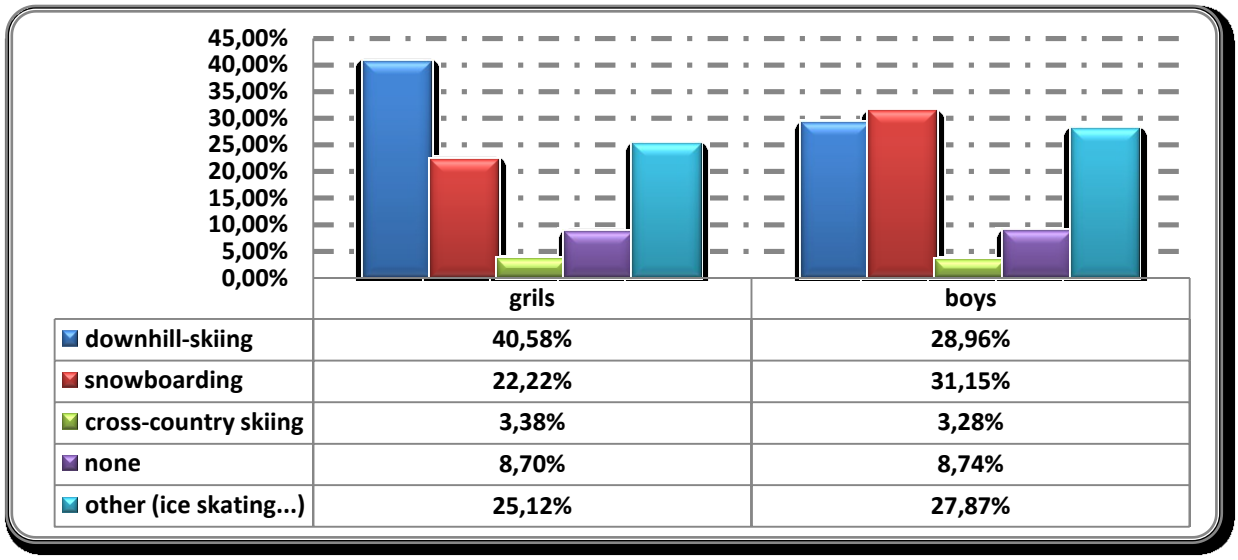
Table 2 Statistical evaluation of winter and summer sports preference among pupils

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	♣	N

Legend: ♣ ♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05

N = not statistically significant

Which winter sport is the most popular among pupils was investigated in another issue. We found out that in a group of girls the most popular winter sports is downhill skiing – 40,58% (Figure 4). In the group of boys snowboarding slightly dominated – 31,15%. Option "other" opted 25,12% of girls and 27,87% of boys. Pupils in this response most frequently indicated ice-skating. Our results correlate with the results of Michal (2011) and Chovanová (2011).



	grils	boys
downhill-skiing	40,58%	28,96%
snowboarding	22,22%	31,15%
cross-country skiing	3,38%	3,28%
none	8,70%	8,74%
other (ice skating...)	25,12%	27,87%

Figure 4 Preference of selected winter sports among pupils

The answers to this question from the perspective of statistical evaluation were not significant (Table 3).

Table 3 Statistical evaluation of selected winter sports preferences among pupils

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	N	N

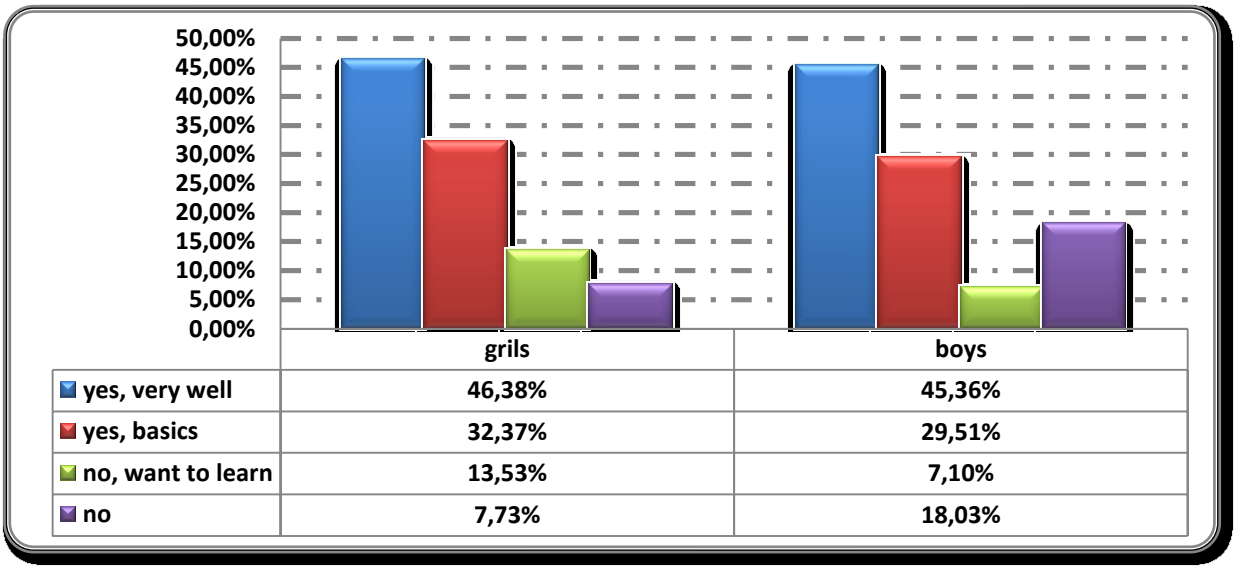
Table 3 Statistical evaluation of selected winter sports preferences among pupils

Legend: ♣ ♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05

N = not statistically significant

Furthermore, we wanted to find out how the pupils evaluate their skiing skills and by non-skiers if they are interested in learning to ski, because according to Michal (2001)

downhill skiing is one of the healthiest skiing sports, thanks to the environment in which the skier moves and because of the versatility of movement, which a pupil is forced to exercise. It may be seen that the majority of pupils (boys and girls) consider their skiing skills as very good (Figure 5). Basics of skiing knowledge master almost one third of pupils. Other pupils (boys and girls) cannot ski. Given the region, where we conducted this survey, we consider this fact to be positive. As a positive fact can be considered that the group of non-skiers wants to learn to ski – 13,53% of girls and 7,10% of boys.



	grils	boys
yes, very well	46,38%	45,36%
yes, basics	32,37%	29,51%
no, want to learn	13,53%	7,10%
no	7,73%	18,03%

Figure 5 Skiing ability of pupils

Answers to this question were statistically significant only in terms of intersex differences.

Table 4 Statistical evaluation of pupils' skiing skills

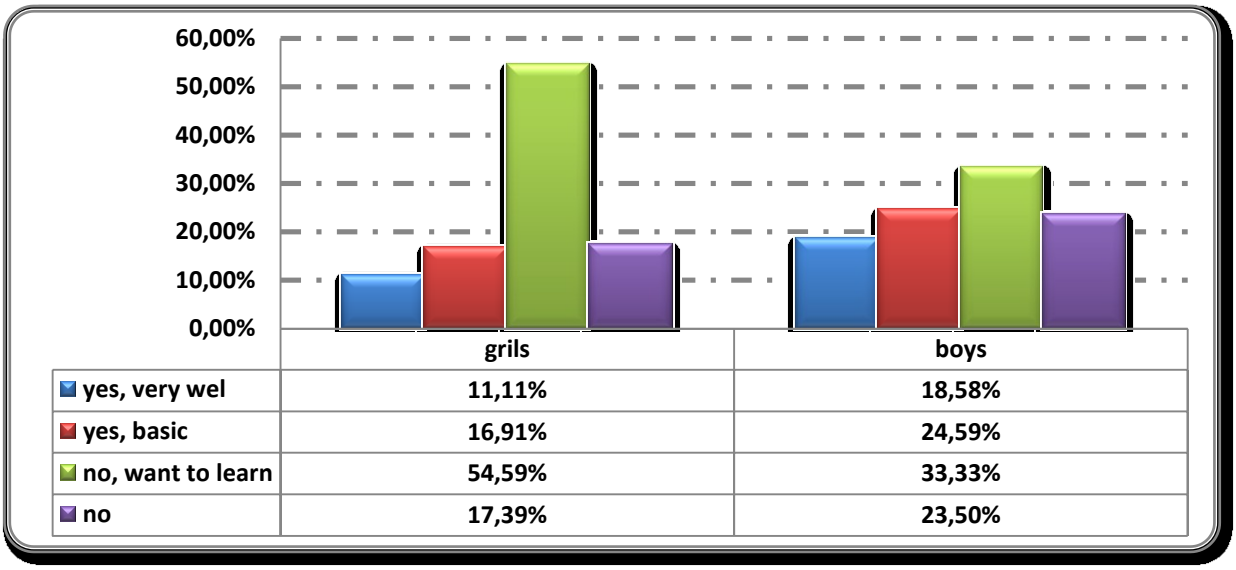
item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	♣♣	N

Legend: ♣ ♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05

N = not statistically significant

Snowboarding abilities of pupils are presented in Figure 6. From it, we can conclude that better snowboarders are considered boys – 18,58% are very good snowboarders and

24,59% master the basics of snowboarding. From the picture it is visible that unaware of snowboarding are 62,80% of girls and 56,83% of boys. Interest in learning snowboarding has 54,59% of girls and 33,33% of boys only. This fact should be used, since the inclusion of snowboarding into the curriculum is being positively evaluated by Melkus (2009), Beťák (2012), who consistently allege that it had made an important step to make physical and sport education more attractive.



	grils	boys
yes, very wel	11,11%	18,58%
yes, basic	16,91%	24,59%
no, want to learn	54,59%	33,33%
no	17,39%	23,50%

Figure 6 Snowboarding ability and interest of pupils in snowboarding

Through statistical evaluation of this question, we recorded statistically significant differences in responses (Table 5) - also in terms of intersex differences and in terms of the popularity of the physical education and sports subject.

Table 5 Statistical evaluation of snowboarding skills among pupils

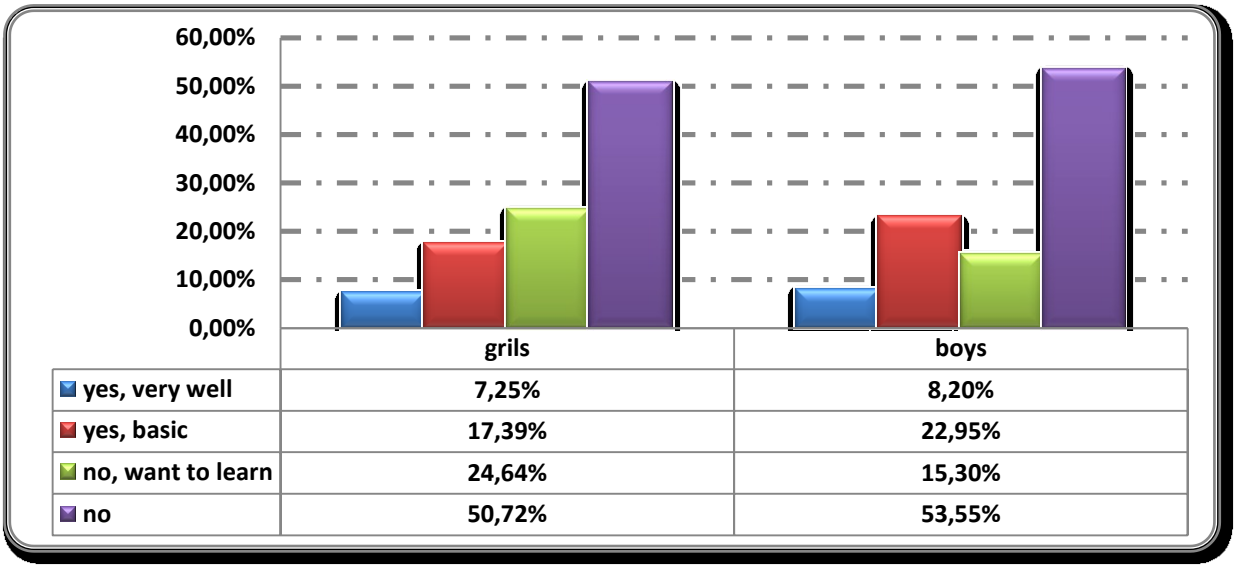
Item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	♣♣	♣

Legend: ♣ ♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05

N = not statistically significant

As we expected basic skills of pupils in the field of cross-country skiing are at a low level (Figure 7). Pupils (boys and girls) to a large extent - more than 50 % are not interested in

learning the basics of cross-country skiing. These facts are consistent with the findings of Král (2007), who investigated whether teachers in primary and secondary schools in Banská Bystrica and Brezno are also devoted to cross-country skiing and to what extent. The results of the work shows that only 22% of teachers pays attention to the cross-country skiing courses in Banská Bystrica and that in a minimal amount (1-2 days for 2 hours). In Brezno, only 25 % of teachers surveyed devote their time to the cross-country skiing courses; in the range 1-2 days depending on conditions. This fact is certainly related to the low interest of pupils in this type of skiing as well as their cross-country skiing skills.



	grils	boys
yes, very well	7,25%	8,20%
yes, basic	17,39%	22,95%
no, want to learn	24,64%	15,30%
no	50,72%	53,55%

Figure 7 Cross-country skiing ability of pupils and their interest in it

Evaluating the responses in terms of statistical significance is presented in Table 6.

Table 6 Statistical evaluation of cross-country skiing ability of pupils

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	N	♣♣

Legend: ♣♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05

N = not statistically significant

We wanted from the pupils to know, whether their school organizes winter physical education camps (cross-country, downhill, snowboard). We found out that 95,17% of girls

and 91,26% of boys confirmed the organization of winter training courses by their school. Statistically significant differences in responses were recorded only in terms of popularity of the physical and sports education subject (Table 7).

According to the research of Paugschová and Kubaščík (2002) on primary school pupils of Central Slovak region, winter training courses were attended by 87,2% of respondents and the most common reason for non-participation were health problems (7,8%). Status of implementation of winter sports in primary schools in Martin was also realized by Michal (2006), and he found out that 88% of schools organize winter ski camps but in an attendance form.

Table 7 Statistical evaluation of winter camps organization from the pupils` perspective

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	N	♣♣

Legend: ♣♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05
N = not statistically significant

Surprising finding is the fact that 47,34% girls and 3,16% boys cannot tell whether their school has suitable conditions for the realization of winter sport camps. Appropriate conditions were expressed by 43% of pupils (Figure 8).

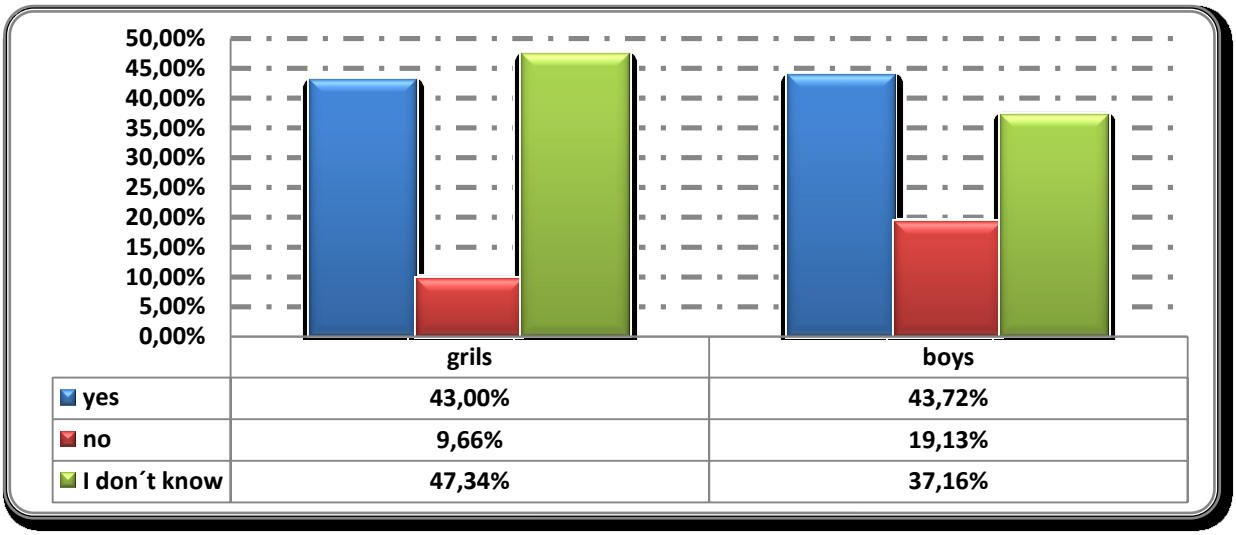


Figure 8 Appropriateness of the schools to implement the winter training courses from the perspective of pupils

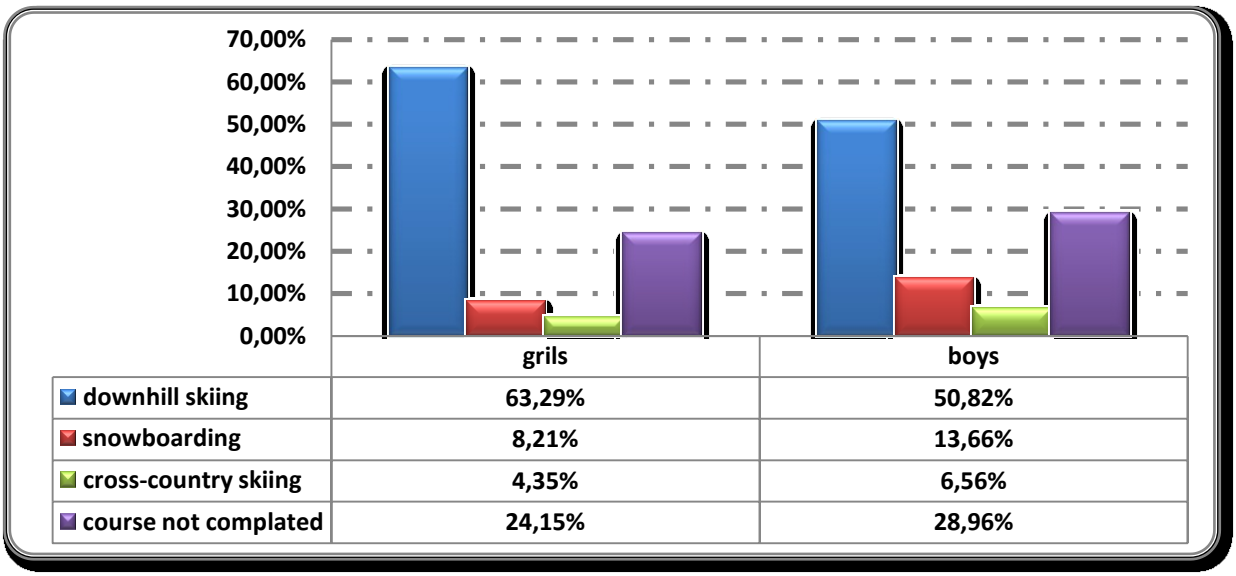
Answers to this question were statistically significant in terms of intersex differences, but also from the popularity perspective of the physical education and sports subject.

Table 8 Statistical evaluation of appropriate conditions for the implementation of winter sports at particular schools based on the pupils` perspective

item	boys/ girls	popularity Tv/ unpopularity Tv
statistical significance chi-kvadrat	N	♣♣

Legend: ♣♣ = statistical significance - level p<0,01; ♣ = statistical significance - level p<0,05
N = not statistically significant

What activity were pupils devoted in physical training camps during the winter, was to find out in the next issue. By the pupils (boys and girls) the dominating response was downhill skiing (Figure 9). Winter training course was not completed by 24,15% girls and 28,96% boys, what is being considered a negative finding.



	gríls	boys
downhill skiing	63,29%	50,82%
snowboarding	8,21%	13,66%
cross-country skiing	4,35%	6,56%
course not complated	24,15%	28,96%

Figure 9 Preferred sporting activities of pupils during winter training courses

Statistically significant differences were found only in terms of popularity of the physical education and sports subject.

CONCLUSION

Winter sports such as skiing, snowboarding, ice-skating, sledding, etc. serve not only the physical and mental recreation, but also the overall development of human personality. All these activities make use of the possibility of universal natural environment, which in addition to beneficial health effect provide unforgettable aesthetic and emotional experiences. The aim of our study was to analyze the pupils` popularity of winter sports at elementary schools in districts Banská Bystrica and Detva.

Based on the results we have achieved through our survey we have listed a few of the findings:

- Winter sports are still popular among pupils. From the perspective of the preferences of winter sports, we found out that winter sports are more popular by boys rather than girls.
- In the group of girls the most popular winter sport is downhill skiing - 40.58% (Pic.4). In the group of boys snowboarding slightly dominated - 31.15%. These findings apparently confirm that skiing and snowboarding still belong among the most preferred winter sports.
- Equipment of schools in terms of winter sports based on the results achieved was not sufficient.
- Cross-country skiing is the least interesting winter sport for pupils, which was confirmed in more than 50% replies of respondents of both sexes.

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PREFERENCIA ZIMNÝCH ŠPORTOV ŽIAKMI ZÁKLADNÝCH ŠKÔL V OKRESE BANSKÁ BYSTRICA A DETVA

SÚHRN

V príspevku sa zaberáme analýzou obľúbenosti zimných športov u žiakov základných škôl v okresoch Banská Bystrica a Detva. Prieskumom sme zistili, že v skupine chlapcov sú zimné športy rovnako obľúbené ako letné, dievčatá však preferujú vo väčšej miere letné športy. Ďalej sme zistili, že v skupine dievčat je najobľúbenejším zimným športom zjazdové lyžovanie a v skupine chlapcov snowboarding. Pozitívnou skutočnosťou bolo pre nás zistenie, že takmer všetci žiaci mali možnosť zúčastniť sa zimného telovýchovného sústredenia v rámci školy.

KĽÚČOVÉ SLOVÁ: zimné športy, základná škola, žiaci, obľúbenosť.

COMPARISON OF THE LEVEL OF PHYSICAL ABILITY OF CHILDREN FROM BOSNIA AND HERZEGOVINA AND CZECH REPUBLIC IN THE CONTEXT OF THE STIMULUS TO PHYSICAL ACTIVITY

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Palacký University in Olomouc, Czech Republic

SUMMARY

The inclination of the youngest age groups of the population to inactivity has been associated with an increase in orthopedic diseases, overweight, obesity and cardiovascular disease in the adult population not only in the Czech Republic. In order to determine the cause of this condition we monitored the relationship and impact of environmental factors on the volume and intensity of physical activity (PA). The aim of this study was to compare the environmental stimuli to the PA and the level of selected motor abilities of children aged 9-11 years, in Bosnia and Herzegovina and the Czech Republic. The partial aim was to assess the PA of the sample with regard to intersex differences. The sample consisted of 126 children aged 9-11 years from selected regions of the countries. The level of motor abilities of children was found by Eurofit test and environmental stimulation to the PA was found by questionnaire ESPA (Environmental Stimulus for Physical Activities). The results showed differences in overall score of environmental stimulation to PA among children from Bosnia and Herzegovina and the Czech Republic. In the test of motor abilities boys from Bosnia and Herzegovina showed significantly better results than boys from Czech Republic in the Plate tapping ($p < 0.001$), Sit and reach ($p < 0,02$), Sit - ups ($p < 0,01$) and the Shuttle run 10x5 m ($p < 0.002$). In girls, there was a significant difference between the samples from both countries only in speed of limb movement – Plate tapping ($p < 0,01$) where girls from Bosnia and Herzegovina have achieved better time (14,69 ± 2,20 sec) in comparison to girls from Czech Republic (16,00 ± 1,16 sec). In comparing of measured physical abilities with regard to intersexual differences girls from both the countries showed better values in tests Flamingo balance test and Sit and reach ($p < 0,05$) than boys. On the other side boys have achieved

significantly better performance in Standing broad jump ($p < 0,05$) and Sit - ups ($p < 0,05$). It was proved relation between spatial stimulation and levels of selected motor abilities. The relationship between material stimulation and levels of physical ability were found. Based on the findings for pupils of secondary school age (8-11 years) it can be recommended differentiated approach in terms of intersexual difference both in stimulating of PA and in the development of motor abilities.

KEY WORDS: environmental stimuli, questionnaire, motor abilities, young children.

INTRODUCTION

Spontaneously created movement regime rarely meets the needs of man's increasing fitness and resistance. Especially in children when the interest is focused on physical activity (PA) and creating a lifelong positive attitude towards the physical activity (PA) cannot rely on the child's natural desire for movement. A positive change in the environmental stimulation to the PA may cause a positive change in the movement behavior, whether it is directed to the correcting of the individual reaction to the environment or to the environmental changes. The environmental conditions in which the child lives are important not only for the creation, but also to maintain a positive physical activity behavior (Kristjansdottir & Vilhjalmsson, 2001; Veitch, Bagley, Ball & Salmon, 2006; Ridgers, Stratton, Fairclough & Twisk, 2007). Monitoring the relationship between the environmental factors to the PA and influence of these factors on the volume and intensity of PA is currently very actual especially in relation to the impact on the health of the population of various countries. This issue is therefore devoted by many authors (Burdette & Whitaker, 2005; Bartík, 2009; Lopez & Hynes, 2006; Gorner & Starší, 2001; Kuo, Voorhees, Haythornthwaite & Young, 2007; Michal, 2002). The obtained studies are then used as a base for achieving health goals accepted by national governments. They enable to choose the optimal state strategy leading to the healthy lifestyle and "healthy behavior" of the population and changes in the socio-political and environmental conditions, which will lead to the "positive" behavior of the population (Brownson, Housemann, Brown, et al., 2000; Frank & Engelke, 2001; Australian Government Initiative: Department of Health and Ageing, 2004; Hillsdon, Foster & Thorogood, 2005; Wendel-Vos, Droomers, Kremers, Brug & van Lenthe, 2007). As an example is the appellation for more effective urbanization of cities from the perspective of PA, the widespread availability of sports facilities and also promoting the higher level of PA from the state. It is increasing the importance of promoting and creating the complexly school-based programs and projects

focused at health care and health education. Suitable spatial and material conditions are considered to be serious positive factors for implementing PA (Frank & Engelke, 2001).

Well-planned urban environments that separates cyclists and pedestrians from automobile traffic, increases the safety of cycling and walking, and thus its preference to the detriment of vehicular traffic. (Eyler, Brownson, Bacak, & Housemann, 2003; Boarnet et al., 2005; Lopez & Hynes, 2006; Kochtitzky et al., 2006; de Geus, De Bourdeaudhuij, Jannes, & Meeusen, 2007). Sallis & Owen (2002) or Rychtecký et al. (2006) report the environmental impact of human activity which is based on the assumption that specific environment evokes a mode of human behavior.

Powell, Slater, Chaloupka & Harter (2006) showed that the unavailability of a device that enables and supports physical activity may be the cause of the decline of PA in population with low socio-economic status.

In connection with the children's PA was mentioned the quality of the environment from the perspective of the safe movement in the study *Growing Up In Australia: Longitudinal Study of Australien Children* (Australian Government Initiative: Department of Health and Ageing, 2004). Space appropriate for children's PA is chosen by parents who positively evaluate the safety of the playgrounds, clean residence area, availability of parks, playgrounds, children playgrounds, good lighting of outdoor surfaces and deployment status of tracks and roads at home. Other important factors (from the perspective of parents) are optimal conditions of hygienic rules, qualified supervision, access to toilets and fresh drinkable water, adequate lighting, etc.

Children's stimulation for PA depends on residence location, school location and region of residence (town, village). An equally important role is toys for physically stimulating and sports equipment (McKenzie, Sallis, Nader, Broyles & Nelson, 1992; Zask, van Beurden, Barnett, Brooks & Dietrich, 2001; Ridgers, Stratton & Fairclough, 2006).

The family is especially important for the primary children socialization which is the initial process for defining their own identity, learn the rules and standards valid in the community to which they belong. During primary socialization child learns through the PA social skills that are necessary for the operation of a specific PA. (Horne, Tomlinson & Whannel, 1999). Thus that the family affects the range of social skills that the child receives. Parents can influence the choice of PA by going with their children to the sports facilities, show them the safest way to the sports facilities, eventually may encourage walking or cycling to school and back. EHHI (Logstrup, 2001) states, that children and young people currently need to be stimulate to PA.

Parents of children in preschool age, school age, and teenagers may directly or indirectly obstruct implementation of the PA of their children. They control or determine the choice of environment for children's PA and define the mode of transportation to them. Specifies the length of stay on playground, but also encourage and incite their children to the implementation of PA, and that most among preschool children. (Brooks-Gunn, Duncan, & Aber, 1997; Kirk, Carlson, O'Connor, Burke, Davis & Glover, 1997; Taylor, Blair, Cummings, Wun & Malina, 1999).

According to the foreign studies the level of children's PA significantly correlates with socio-economic conditions of the family and depends on environmental conditions. Important impact has the completeness or incompleteness of the family, level of parents' education and occupation. During child's growth and development the parents' education ranks among the most significant characteristics which affect other socio-economic factors (Sichieri, Taddei & Everhart, 2000; Silventoinen, 2003).

Coakley (2001) and Laing (2002) describe the scope of children depending on the willingness of parents to invest money, time and personally commitment in case that their child wants to play sports. Collins (1999) alerts parents to talk with children about their interests and help them in finding proper PA, allowing them to attend various activities in clubs and association related with programs in PA. The project *"Lifestyle and obesity in 2005"* (ČSL JEP & ČOS JEP, 2006a) recommends that parents of 6-12 year old children should pay attention to the weight of their children and react to the child's tendency to passive and sedentary entertainment (watching TV, video, DVD, playing computer games). They should offer compensation for passive activity through physical activities.

Coakley (1987) provides an interesting idea – a support of children's sport should be presented to the public as part of a model of good parenting and try to get into the awareness of parents. Children's sport could become the ideology supported by family and parenting. Physical activities should be offered as a chance to develop family relationships and togetherness. Harrington (2003) found in Australian families, that although the parents consider togetherness as an important element of family life, they do not see clearly the possibility of using physical activity to develop this togetherness.

Another frequently mentioned factor in the effort to increase the PA of children and youth is the transport stimulation. Building a network of safety roads for walking and cycling nearby schools for independent children's transport to and from school was recommended by Moudon & Lee (2003).

On necessity to improve knowledge of traffic rules and traffic education, as an element of safety during transport not only in schools, alert Boarnet et al. (2005). Increasing the active transport (walking, cycling, rollerblading, etc.) stimulates children to PA and if it carried out with other children then has socialization effects. EHHI (Logstrup, 2001) supports preference of walking and cycling as an important instrument of prevention against obesity and cardiovascular disease in the children's and youth's lives.

The environmental influence is currently studied type of impact on the man's physical activity. Current studies are often limited to a small part of the population (eg. only for older women, college students, clinical patients, high school students, etc.) and thus prevent the creation of generally valid criteria (Baker, Brennan, Brownson & Housemann, 2000; Wendel-Vos, Droomers, Kremers, Brug & van Lenthe, 2007).

AIM

The aim of the research was to describe and analyze the level of motor abilities in a group of children from the Czech Republic and Bosnia and Herzegovina and their comparison in the context of environmental conditions. The operational objective was to compare the data obtained from the two countries in the term of intersex differences.

METHODOLOGY

The research sample from Bosnia and Herzegovina - Banja Luka region consisted of 73 children (34 boys and 39 girls) with average age of 10,75 ± 0,9 years (boys: 10,8± 0,5, girls: 10,7± 0,4). The average BMI for this group was 17,72 ± 3,2 kg · m^2 (boys: 17,50± 1,4; girls: 17,91± 1,8) (Table 1).

Table 1 The characteristics of the research sample

Sample	n	Age [years]	Height [cm]	Weigth [kg]	BMI	BMI Percentil	BMI Evaluation
BH – overall	73	10,75	147	38,06	17,72	10-25	Slim
BH – boys	34	10,70	146	37,48	17,50	10-25	Slim
BH – girls	39	10,80	147	38,64	17,91	10-25	Slim
CR – overall	53	10,25	147	35,79	16,62	10-25	Slim
CR – boys	30	10,20	147	35,95	16,64	10-25	Slim
CR – girls	23	10,30	146	35,57	16,80	10-25	Slim

Legend: BH - Bosnia and Herzegovina; ČR – Czech Republic; n – number of probands

The research sample from the Czech Republic - Olomouc region consisted of 53 children (30 boys and 23 girls) with average age of 10,25 ± 0,6 (boys: 10,20± 0,2; girls: 10,30± 0,4). The average BMI for this group was 16,62 ± 2,8 kg · m^2 (boys: 16,64± 1,6 kg · m^2; girls: 16,80± 2,0 kg · m^2) (Table 1).

The most contemporary researches related to the environmental factors in the context of the PA are based on the questionnaire studies (Brownson et al., 2001; Eyler, Brownson, Bacak, Housemann, 2003; Addy et al., 2004; Dowda, Pate, Trost, Almeida & Sirard, 2004; Barnet et al., 2006; de Geus, De Bourdeaudhuij, Jannes & Meeusen, 2007; Harms, Cryer & Clifford, 2007). Only in the survey sample of preschool children and children, from the first or second grades of primary schools is necessary to use the administrators.

For the evaluation of environmental stimulation for physical activity, with regard to the age of the probands, was used the questionnaire ESPA (Environmental Stimulus for Physical Activity) Vanreusel & Renson (1980). This questionnaire assesses the stimulation of the children from 6 years old to PA, both in the family and at school. The questionnaire determines the spatial and material resources for physical activity at school and in the family, formal participation in sports and children's organizations and transport impulses to PA.

To determine the level of motor abilities was used Eurofit Test (1988). Dependence of data (level of motor abilities and environmental stimuli) encountered in each country, and also the comparison of gender was evaluated by two-factor analysis of variance (ANOVA). As a post-hoc test was used Fisher's LSD test (Least Significant Difference). For monitoring of relationship between the level of environmental stimuli and levels of motor abilities was used analysis of the correlation - Spearman's rank correlation coefficient (r_s). Measurements were carried out in the month of September in the Czech Republic and Bosnia and Herzegovina. Due relatively low age of probands was consent agreement from their legal representatives. For the implementation of the research was issued ethics committee approval from the Faculty of Physical Culture at Palacký University in Olomouc, Czech Republic.

RESULTS AND DISCUSION

In terms of evaluation of the level motor abilities Czech boys performed better results than Czech girls in subtests Standing broad jump (by 12,55 cm) and Sit – ups (by 0,60 no), where there was a significant difference only in the subtest Standing broad jump ($p < 0,012$). Czech girls were better than Czech boys in subtests: Flamingo balance test (by 2,58 sec), Plate tapping (by 0,27 sec), Sit and Reach (by 4,37 cm) and Shuttle run 10x5 m (by 0,13 sec).

Statistically significant difference occurred only in the subtest Sit and reach (p <0,006) (Figure 1).

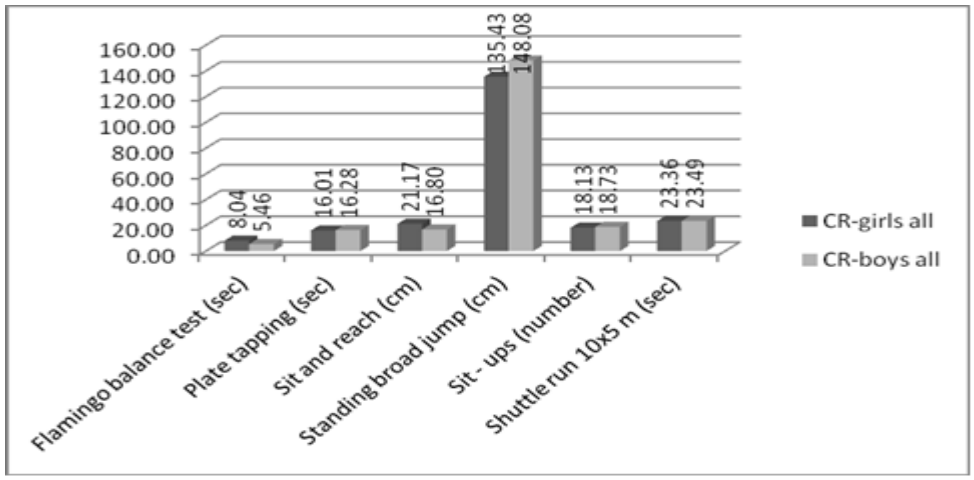

Figure 1 Results of selected Eurofit subtests of girls and boys from Czech Republic (nCR girls=23, nCR boys=30)

Legend: $CR_{-girls\ all}$ – number of girls from Czech Republic; $CR_{-boys\ all}$ – number of boys from Czech Republic; *Subtest* Flamingo balance test (sec); *Subtest* Plate tapping (sec); *Subtest* Sit and reach (cm)*; Subtest* Standing broad jump (cm)*; Subtest Sit - ups* (number); *Subtest* Shuttle run 10x5 m (sec).

Boys from Bosnia and Herzegovina had performed better results than girls in subtests Plate tapping (by 0,35 sec), Standing broad jump (by 9,01 cm), Sit - ups (by 2,72 no) and Shuttle run 10x5 m (by 1,21 sec). A significant difference has shown in subtests Standing broad jump (p <0,035), Sit - ups (p <0,01) and Shuttle run 10x5 m (p <0,01). Girls had performed better results than boys in subtests Flamingo balance test (by 1,93 sec) and Sit and reach (by 3,22 cm). A significant difference has shown only in the subtest Sit and reach (p <0,02) (Figure 2).

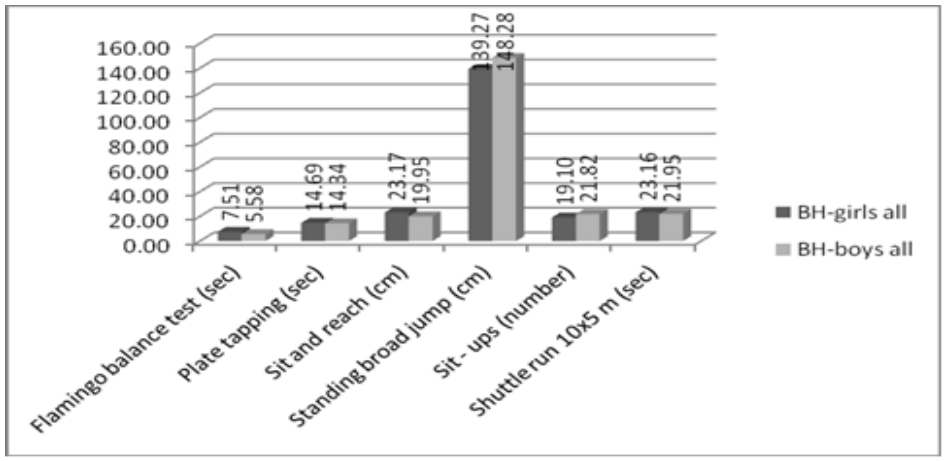

Figure 2 Results of selected EUROFIT subtests of girls and boys from Bosnia and Herzegovina (nBH girls=39, nBH boys=34)

Legend: $BH_{-girls\ all}$ – number of girls z Bosnia and herzegovina; $BH_{-boys\ all}$ – number of boys z Bosnia and Herzegovina; *Subtest* Flamingo balance test (sec); *Subtest* Plate tapping (sec); *Subtest* Sit and reach (cm); *Subtest* Standing broad jump (cm); *Subtest Sit - ups* (number); *Subtest* Shuttle run 10x5 m (sec)

Children from Bosnia and Herzegovina achieve better results than children from Czech Republic in subtests: Flamingo balance test (by 0,04 sec), Plate tapping (by 1,64 sec), Sit and reach (by 2,31 cm), Standing broad jump (by 3,21 cm), Sit - ups (by 1,90 no), Bent arm hang (girls by 0,65 sec, boys by 2,18 sec) and Shuttle run 10x5m (by 0,94 sec). Significant differences between the samples from both states were found only in one subtest i.e. Plate tapping (boys: $p < 0,001$ and girls: $p < 0,01$) (Figure 3).

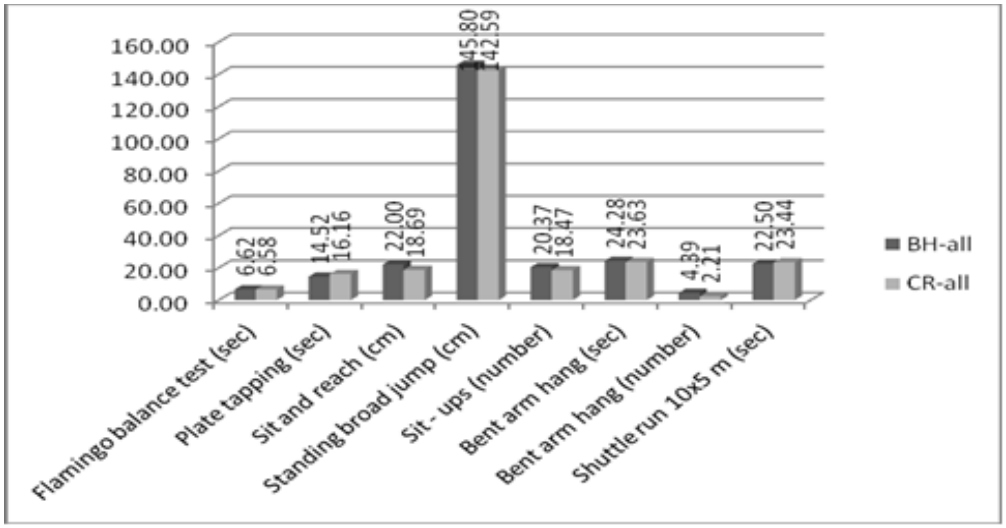

Figure 3 Results of selected EUROFIT subtests of overall sample from Bosnia and Herzegovina and overall sample from Czech Republic; nBH=73 (girls=39, boys=34), nCZ=53 (girls=30, boys=23)

Legend: BH_{-all} – Bosnia and Hercegovina overall; CR_{-all} - Czech Republic overall; *Subtest* Flamingo balance test (sec); *Subtest* Plate tapping (sec); *Subtest* Sit and reach (cm); *Subtest* Standing broad jump (cm); *Subtest Sit - ups* (number); *Subtest* Bent arm hang *(sec)*; *Subtest* Bent arm ups *(number)*; *Subtest* Shuttle run 10x5 m (sec)

Boys from Bosnia and Herzegovina have achieved significantly better results than boys from Czech Republic in some motor ability tests. Particularly in detection tests like plate tapping ($p < 0,001$) (by 1,94 sec) which measures the speed of limb movement and the Sit and reach test ($p < 0,029$) (by 3,15 cm) which measures the level of flexibility. Boys from Bosnia and Herzegovina also showed greater trunk muscle strength, assessed by Sit - ups ($p < 0,01$) (3,09 no) and the test for the speed of running - Shuttle run 10x5 m ($p < 0,002$) (1,54 sec) (Figure 4).

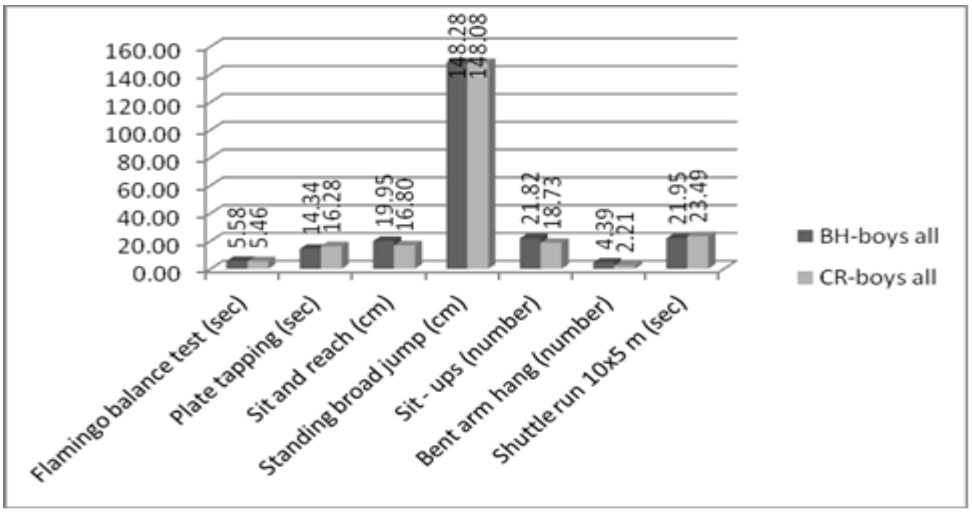

Figure 4 Results of selected EUROFIT subtests of boys from Bosnia and Herzegovina and boys from Czech Republic (nBH boys=34, nCR boys=30)

Legend: $BH_{-boys\ all}$ – number of boys z Bosnia and Herzegovina; $CR_{-boys\ all}$ – number of boys z Czech Republic; *Subtest* Flamingo balance test (sec); *Subtest* Plate tapping (sec); *Subtest* Sit and reach (cm)*; Subtest* Standing broad jump (cm)*; Subtest Sit - ups* (number); *Subtest* Bent arm ups *(number)*; *Subtest* Shuttle run 10x5 m (sec)

In girls, there was a significant difference between the samples from both countries only in speed of limb movement – Plate tapping ($p < 0,01$) where girls from Bosnia and Herzegovina have achieved better time (14,69 ± 2,20 sec) in comparison to girls from Czech Republic (16,00 ± 1,16 sec) (Figure 5).

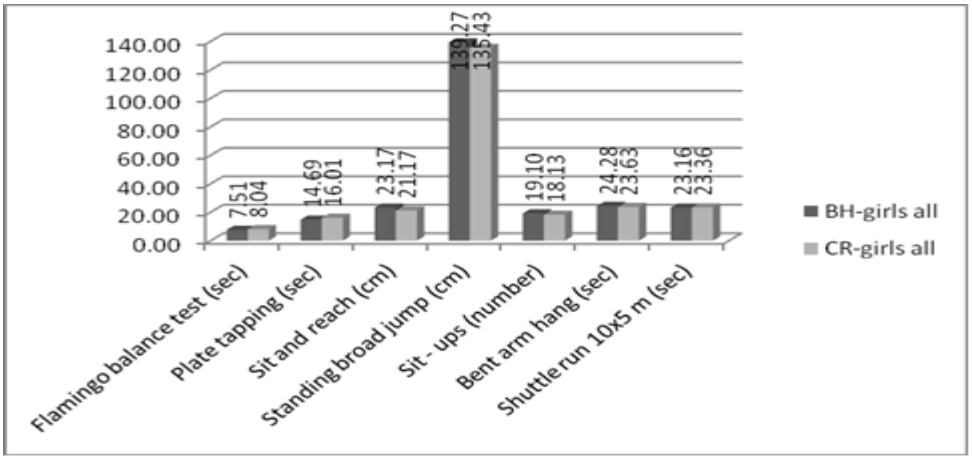

Figure 5 Results of selected EUROFIT subtests of girls z Bosnia and Herzegovina and girls from Czech Republic (nBH girls=39, nCR girls=23)

Legend: **$BH_{-girls\ all}$** – Bosnia and Herzegovina girls overall, **CR- girls all** – Czech Republic overall; *Subtest* Flamingo balance test (sec); *Subtest* Plate tapping (sec); *Subtest* Sit and reach (cm)*; Subtest* Standing broad jump (cm)*; Subtest Sit - ups* (number); *Subtest* Bent arm hang *(sec)*; *Subtest* Shuttle run 10x5 m (sec)

School children give great importance to physical fitness; they compare each other in terms of physical fitness and show a desire for success in it. Lack in physical fitness and motor skills are often the cause of social rejection (Belej, 2001; Fürstová, 1997; Jansa & Kocourek In Martiník et al., 2007; Matějček, 2004; Vágnerová, 2005).

During development of motor abilities, it is necessary to take into consideration biological age, preliminary level of motor abilities and the level of mastered motor skills in previous periods of childhood. In children it can be start with the strengthening of muscle groups, but only dynamically with the weight of the own body. The development of the nervous system is important with a wide range of incentives, children's creativity, motivation to participate in voluntary and interested physical education and stimulation for spontaneous physical activity. In that age, it is also necessary to pay attention to children's weight (Perič, 2004).

In the early school age they are starting to show a very strong tendency to sedentary and passive entertainment, such as watching TV, computer games, or need to study more. It is therefore necessary that the child has an adequate level of physical activity to compensate against inactivity for example during school lessons. Clearly hyperactive children who move almost all day should be marked off from children who are not interested in any kind of physical activity. Because the period that follows is puberty (a period of further accelerating of growth), it is necessary to develop agility, coordination abilities and speed with regard to physical fitness and endurance.

In connection with the obligatory school attendance, authors like Máček & Vavra (1988), Vařeková (1999), Riegerová, Přidalová & Ulbrichová (2006) pointed out the possibility of increasing the risk of muscle imbalance followed by poor posture.

The influence of spatial conditions to the level of PA that children have were reported by Dowda, Pate, Trost, Sirard & Almeida (2004), who discovered connections between the supply of area to play, level of teacher's education and the time that children spent in sedentary activities. Obligatory forms of physical education in primary schools usually take place because of time in the gym or on the playground. The use of other spaces for PA such as school corridors, the vestibules and atria are lacking.

Pate, Pfeiffer, Trost, Ziegler & Dowda (2004) point out the fact that the exercise regime in schools is significantly correlative with high and medium intensity levels of child's PA.

Inappropriate exercise regime may contribute to the occurrence of higher BMI in children. Psychologists recommend spontaneous PA, where children determine its load and relaxation, which satisfies their needs for exercise and interests (Matějček, 2004).

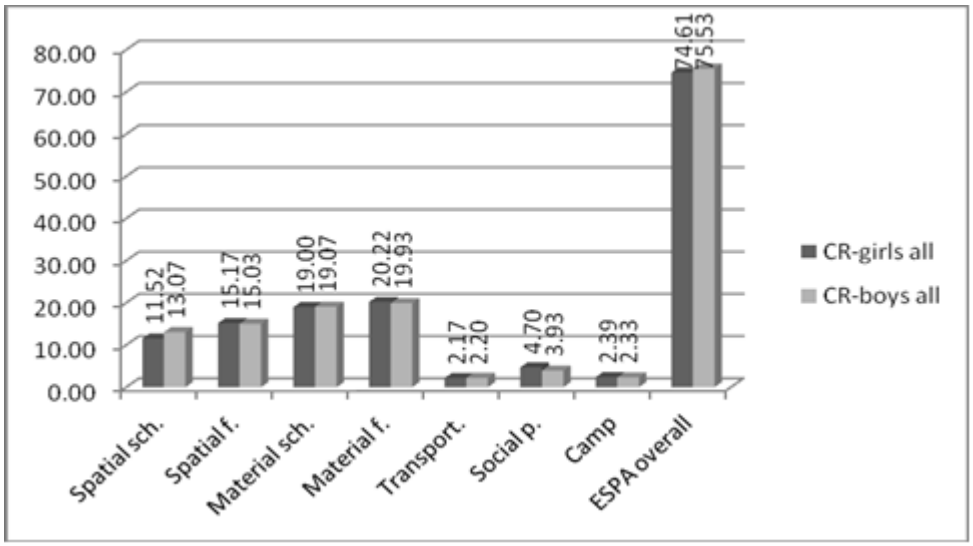

Figure 6 Results in environment stimulation for PA from ESPA questionnaire in sample of girls and boys from Czech Republic [points]; (nCR girls=23, nCR boys=30)

Legend: **$CR_{-girls\ all}$** – number of girls from Czech Republic; **$CR_{-boys\ all}$** – number of boys from Czech Republic; **b_{CR}** – number of boys from Czech Republic; **g_{CR}** – number of girls from Czech Republic; **Spatial sch.** - spatial play stimulus at school; **Spatial f.** – spatial play stimulus in the family; **Material sch.** – material play stimulus at school; **Material f.** – material play stimulus in the family; **Transport.** - transportation stimulu; **Social p.** – social participation stimulus (organizational context of sport involvement; **Camp** – participation (in camps); **ESPA ocerall** – overall environmental stimulus

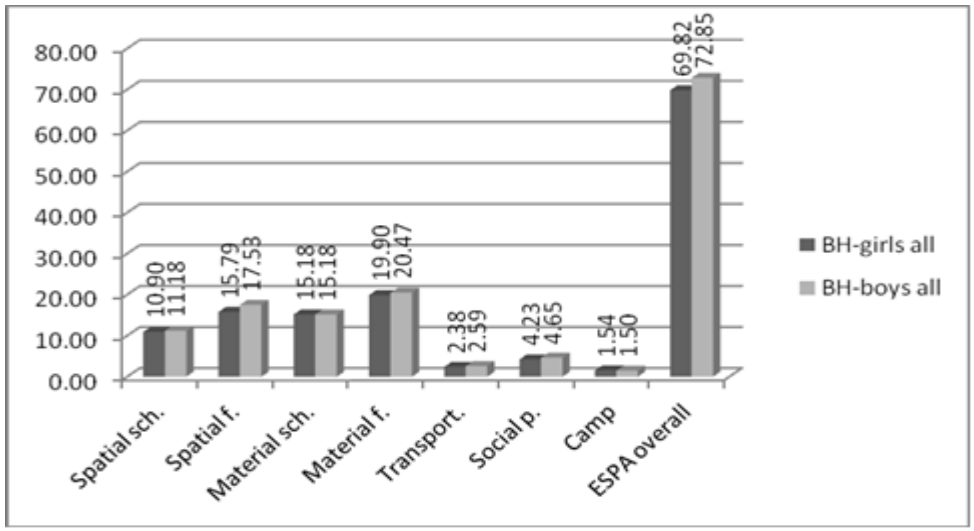

Figure 7 Results in environment stimulation for PA from ESPA questionnaire in sample of girls and boys from Bosnia and Hercegovina [points]; (nBH girls=39, nBH boys=34)

Legend: **$BH_{-girls\ all}$** –number of girls from Bosnia and Hercegovina; **$BH_{-boys\ all}$** – number of boys from Bosnia and Hercegovina; **Spatial sch.** - spatial play stimulus at school; **Spatial f.** – spatial play stimulus in the family; **Material sch.** – material play stimulus at school; **Material f.** – material play stimulus in the family; **Transport.** - transportation stimulus; **Social p.** – social participation stimulus (organizational context of sport involvement; **Camp** – participation (in camps); **ESPA ocerall** – overall environmental stimulus

Among the children from both countries those from Bosnia and Herzegovina have shown better results in the individual subtests of the ESPA questionnaire for spatial play stimulus in the family (by 1,51 pts) and material play stimulus in the family (by 0,10 pts). social participation (by 0,16 pts) transportation stimulus (by 0,29 pts). Children from Bosnia and Herzegovina prefer more transportation to and from school on foot or by bike. They are also more engaged with the organization, which offers physical activities in the leisure time, after school lessons. Children from the Czech Republic have more space which stimulates physical activity in schools than children from Bosnia and Herzegovina, as well as sports equipment and tools that support physical activity. These children show greater involvement in children's camps and sports camps, which corresponds with traditions in Czech Republic. But these differences are not significant (Figure 8). But these differences are not significant.

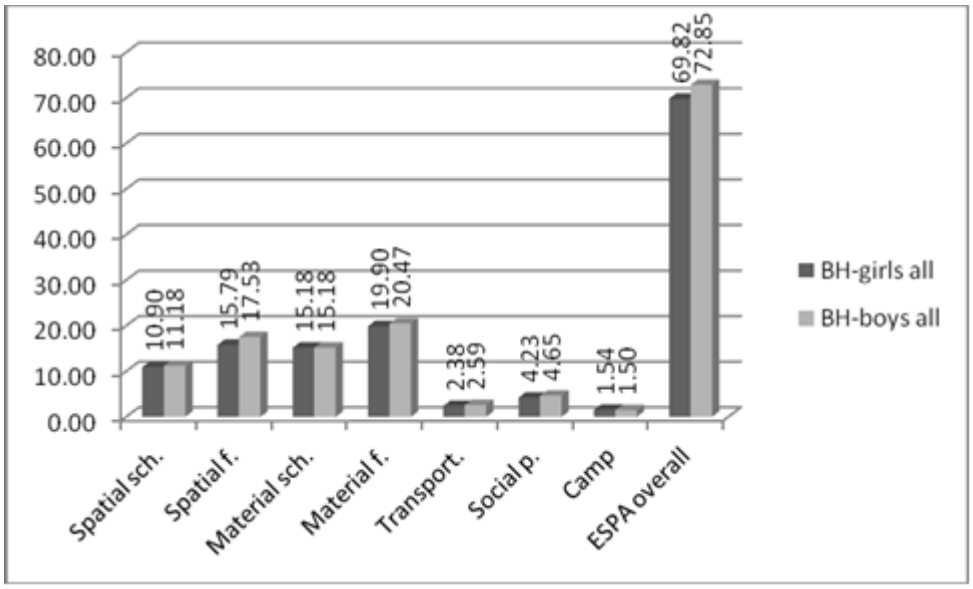

Figure 8 Results in environment stimulation for PA from ESPA questionnaire in overall sample from Bosnia and Herzegovina and Czech Republic [points]; nBH=73 (girls=39, boys=34), nCZ=53 (girls=30, boys=23)

Legend: **BH_{-all}** – Bosnia and Hercegovina overall; **CR_{-all}** - Czech Republic overall**; Spatial sch.** - spatial play stimulus at school; **Spatial f.** – spatial play stimulus in the family; **Material sch.** – material play stimulus at school; **Material f.** – material play stimulus in the family; **Transport.** - transportation stimulu; **Social p.** – social participation stimulus (organizational context of sport involvement; **Camp** – participation (in camps); **ESPA ocerall** – overall environmental stimulus

The sample of children from the Czech Republic had an average total of 75,13 points per person in ESPA questionnaire, which according to the scoring table of ESPA questionnaire means that environmental stimulation to physical activity in children in the

Czech Republic is in the “upper diameter” zone. The sample of children from Bosnia and Herzegovina had an average total of 71,23 points per person in ESPA questionnaire, which according to the scoring table means that the level of environmental stimulus is in the "lower diameter" zone. Differences in the level of environmental stimulation for physical activity in researched group of children are not significant.

Saelens, Sallis & Frank (2003) see the lack of access to the school playgrounds and school gyms after classes as a key problem. Many authors with their researches had confirmed that free access to playgrounds or parks correlate with increased PA of children and youth (Burdette & Whitaker, 2005; Cohen, Ashwood & Scott, 2006). They assume a potential active role of environment as an alternative to "sedentary" children's habits (watching TV, computer games, etc.). Children who lived in areas that were considered to be less safe by their mothers watched television for more than two hours a day.

In comparison with foreign school management, management in Czech Republic allows free access to school playgrounds and gyms after classes (sometimes they rent it). In this context, the interesting results of the research by Westerstahl, Barnekow-Bergvist & Hedberg (2003), who monitored the use of school playgrounds with services that were open after school hours and on weekends at a specified time for two years, noted a 84% increase in the use of the playground by children. It is therefore clear that the safety of the environment plays a significant role in children or their parents.

Boys from Czech Republic achieved significantly better results than boys from Bosnia and Herzegovina in the material play stimulus at school ($p < 0,001$) (by 3,89 pts) and in participation in summer and sports camps ($p < 0,001$,) (by 0,88 pts) (Figure 9). Boys from Bosnia and Herzegovina had a higher number of points in spatial (by 2,50 pts) and material play stimulus in the family (0,54 pts), although not statistically significant. They prefer transport to school on foot or by bike and they are more involved in the sports clubs and children's organizations for leisure time than boys from the Czech Republic. (Figure 9).

The sample of children from the Czech Republic achieved an average total of 75,13 points per person in the ESPA questionnaire, which according to the scoring table means that environmental stimulation for physical activity in children from the Czech Republic is in the "upper diameter" zone. The sample of children from Bosnia and Herzegovina achieved an average total of 71,23 points per person in the ESPA questionnaire which according to the scoring table means that environmental stimulation for physical activity is in the "lower diameter" zone. Differences in the level of environmental stimulation for physical activity in

the researched group of children are not significant. The boys from the Czech Republic had an average total of 75,53 points per person in the ESPA questionnaire, which means that their results in environmental stimulation for physical activity are in the "upper diameter" zone. The sample of boys from Bosnia and Herzegovina reached an average total of 72,85 points per person, which means that the total stimulation to physical activity is in the "lower diameter" zone (Figure 9). There were no significant differences between the results in both groups of boys.

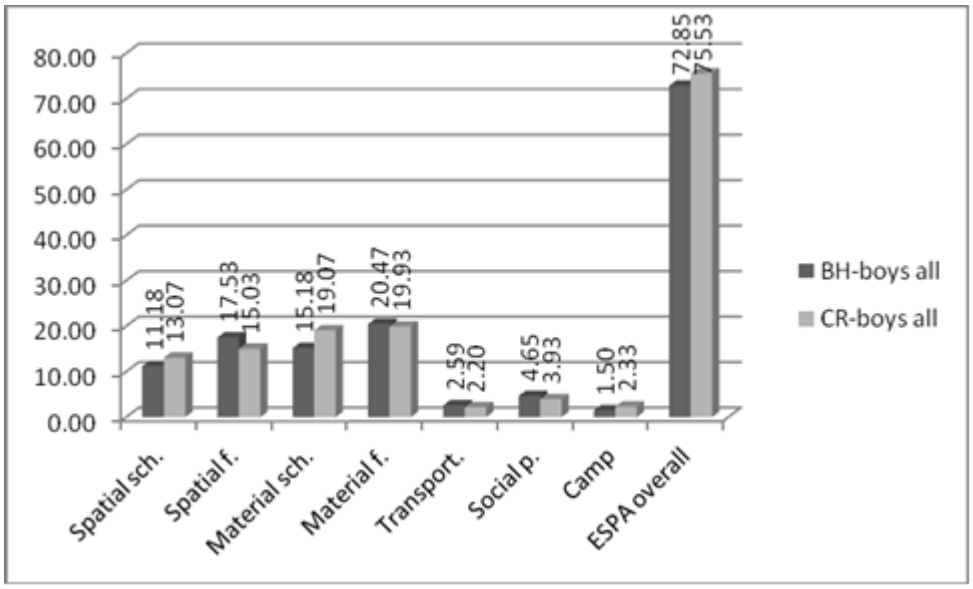

Figure 9 Results in environment stimulation for PA from ESPA questionnaire in sample of boys from Bosnia and Herzegovina and Czech Republic; (nBH boys=34, nCR boys=30)

Legend: **$BH_{-boys\ all}$** –number of boys from Bosnia and Hercegovina; **$CR_{-boys\ all}$** – number of boys from Czech Republic; **Spatial sch.** - spatial play stimulus at school; **Spatial f.** – spatial play stimulus in the family; **Material sch.** – material play stimulus at school; **Material f.** – material play stimulus in the family; **Transport.** - transportation stimulu; **Social p.** – social participation stimulus (organizational context of sport involvement; **Camp** – participation (in camps); **ESPA ocerall** – overall environmental stimulus

In general it can be said that girls from Bosnia and Herzegovina reached in observed factors questionnaire ESPA better results only in spatial stimulus play in the family and in transportation stimulus. Statistically significant differences between girls results from ESPA questionnaire have shown in subtest the material play stimulus at school ($p < 0,001$) (by 3,82 pts) and participation (in camps) ($p < 0,001$) (by 0,85 pts) (Figure 10). Girls from the Czech Republic achieved an average total of 74,61 points per person, and this result is in the "upper diameter" zone. Sample of girls from Bosnia and Herzegovina achieved an average total of 69,82 points per person and according to scoring table which means that it is included in the zone "lower diameter." Among the results, a significant difference was ($p<0,001$).

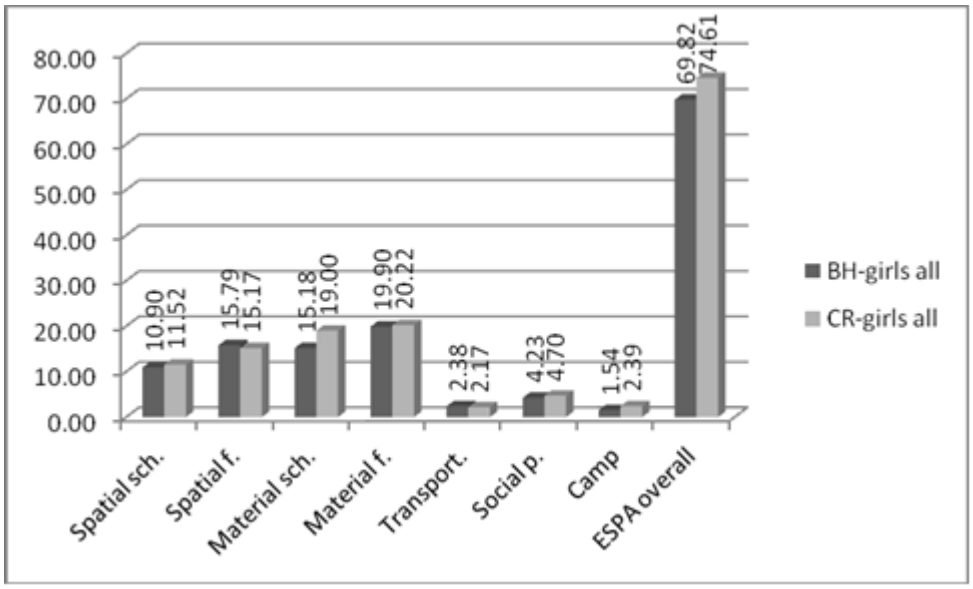

Figure 10 Results in environment stimulation for PA from ESPA questionnaire in sample of girls from Bosnia and Herzegovina and Czech Republic; (nBH girls=39, nCR girls=23)

Legend: **$BH_{girlsall}$** –number of girls from Bosnia and Hercegovina; **$CR_{girlsall}$** – number of girls from Czech Republic; **Spatial sch.** - spatial play stimulus at school; **Spatial f.** – spatial play stimulus in the family; **Material sch.** – material play stimulus at school; **Material f.** – material play stimulus in the family; **Transport.** - transportation stimulu; **Social p.** – social participation stimulus (organizational context of sport involvement; **Camp** – participation (in camps); **ESPA ocerall** – overall environmental stimulus

The overall sample from Bosnia and Herzegovina showed a medium correlation between results from ESPA questionnaire and Eurofit test in total environmental stimulation to physical activity and balance abilities (r_s = 0,31 p <0,01). It also indicates that the size of the space for stimulating physical activity in schools (r_s = 0,46 p <0,001) and in families (r_s = 0,25 p <0,05) supports the development of dynamic forces of the lower limbs. Among boys from Bosnia and Herzegovina it was confirmed that a medium correlation between material (r_s = 0.36 p <0.004) and spatial stimulation at school (r_s = 0,44 p <0,008) and balance abilities exists. Likewise a medium correlation between spatial play stimulus at school and dynamic power of the lower limbs also exists (r_s = 0,51 p <0,002). In a group of girls from Bosnia and Herzegovina a medium correlation between spatial stimuli in school, balance ability (r_s = 0,41 p<0,009), dynamic force of lower limbs (r_s = 0,44 p <0,004) and strength of upper limbs (r_s = 0,44 p<0,004) was shown.

Saelens, Sallis & Frank (2003) see the key problem of stimuli for physical activity in inadequate access opportunities in the school playground and gyms in time after classes. Many authors in their researches had confirmed that free access to playground or park correlates with increased PA children and youth (Burdette & Whitaker, 2005; Cohen,

Ashwood & □ Scott, 2006). They assume potential active role of environment as an alternative to "sedentary" children's habits (watching TV, computer games, etc.). Children who living in areas that were seen by their mothers as the least safe watched television more than two hours a day. In comparing with foreign school management, management in Czech Republic allows free access on school playground and gym after classes (sometime they rent it). In this context, the interesting results of research Westerstahl, Barnekow-Bergvist & Hedberg (2003), who after two years of monitoring the use of the school playground, that was opened after school classes and on weekends and always at a specified time monitored by service, note the increase in the use of children in time monitoring playground up to 84%. It is therefore clear that the safety of the environment plays in children (or their parents) a significant role.

In relation to the PA levels of children and therefore their fitness was mentioned the quality of the environment in terms of safe movement in study: *Growing Up In Australia: Longitudinal Study of Australien Children* (Australian Government Initiative: Department of Health and Ageing, 2004). Space appropriate for children's PA is chosen by parents who positively evaluated safe playgrounds, clean residence area, availability of parks, playgrounds, children playgrounds, good lighting of outdoor surfaces and deployment status of tracks and roads at home. Other important factors (from the perspective of parents) are optimal conditions in terms of hygiene, qualified stuff, availability of toilets and fresh water, enough light, etc. According to Stephens (2002) stimulation of children in PA depends on location of the school and region of residence (city, country side).

The same importance have sports equipment and physically stimulating toys. (McKenzie, Sallis, Nader, Broyles & Nelson, 1992; Zask, van Beurden, Barnett, Brooks & Dietrich, 2001; Ridgers, Stratton & Fairclough, 2006). The family is especially important for the primary socialization of children the initial process through which children define their own identity, children learn the rules and norms valid the community which they are part. During primary socialization through PA child learn such social skills that are necessary for running a specific PA (Horne, Tomlinson & Whannel, 1999). The family affects the range of social skills that a child receives. Parents can influence the selection of PA by accompanying children to sports facilities show them the safest way to, eventually can support walking or cycling to school and back. EHHI (Logstrup, 2001) states that children and young people currently need to be stimulate for PA. Parents of school age children may directly or indirectly impede the realization of PA of their children. Control or determine the choice of PA environment for children and define the mode of transportation to them. Determine the

length of stay of a child on the sports ground but also encourage and incite their children to the realization of PA, and that most of preschool and school age (Brooks-Gunn, Duncan & Aber, 1997; Kirk, Carlson, O'Connor, Burke, Davis, & Glover, 1997; Taylor, Blair Cummings, Wun & Malina, 1999). According to foreign studies level PA children significantly correlated with socio-economic conditions of the family, and in dependence on ecological conditions. A significant impact has completeness or incompleteness of the family, parental education and occupation of parents. With the growth and child development parents' education is ranks among the most important characteristics which most affect the other socio-economic factors (Sichieri, Taddei & Everhart, 2000; Silventoinen, 2003). Coakley (2001) and Laing (2002) describe range of children dependence on the personally parents's willingness to invest money, time and commitment when their child wants to do sports.

Research Unit Sport Scotland (2001) states that parents recognize the importance of PA for the physical development, self-esteem, mental health and social development, but they need to be more informed about the appropriate PA for their children at a certain age. Collins (1999) draws parents to talk with children about their interests and help them in finding suitable PA, allowing them to attend various activities and clubs with a program from the PA. Encourage them to engage together with children at various PA such as hiking or ball games. The project *"Lifestyle and obesity in 2005"* (ČSL JEP & ČOS JEP, 2006a) recommends that parents of 6-12 year old kids should pay attention to the weight of their children and react to the child's tendency to passive and sedentary entertainment (watching TV, video, DVD, playing computer games). They should offer compensation for passive activity through physical activities. They should offer compensation for passive activity through physical activities.

Coakley (1987) provides an interesting idea - support of children's sport should be presented to the public as part of a model of good parenting and try to get into the awareness of parents. Children's sport could become the ideology supported by family and parenting. Harrington (2003) found in Australian families, although the parents consider togetherness as an important element of family life, they do not see clearly the possibility of using physical activity to develop this togetherness. Physical activities should be offered as a chance to develop family relationships and togetherness.

Čillík & Čillíková (2004) have shown family influence on level of spatial stimulation for PA. Roemmich Epstein, Raja & Yin (2007) found correlation ($p < 0.01$) between the inactive behavior and environmental conditions at home and in the nearest residence of the child.

In school it is logical choice of space from teachers - school garden or playground (total: 12,98 p, boys: 12,93 p, girls: 13,02 b). Other spaces are very few offered to children. That fact was ascribed to concerns of teachers about children's safety and responsibility to protect the health of their students. It obvious that injuries in schools are caused among others by the fact that younger school children show compared to older age groups increased need for PA. Despite the best efforts of teachers, injuries still occurred. The high injury rate of children in school often leads to a negative evaluation of teachers. Dowda, Pate, Trost, Sirard & Almeida (2004) reported impact of spatial opportunity in school on level of children's PA. They found out correlation between the offer of space to play, teachers education and time devoted to sedentary activities. Similarly, Pate, Pfeiffer, Trost, Ziegler & Dowda (2004) draw attention to the fact that the movement regime in school significantly correlates with high and medium levels of child's PA intensity. Inappropriate movement regime in school may contribute to the occurrence of higher BMI. Psychologists recommended spontaneous PA, where the child determines load and rest by himself and that PA satisfies his need and interests for exercise (Matějček, 2004). Obligatory forms of physical education in primary schools usually take place because of time in the gym or on the playground, and using another space for PA (such as school corridor the vestibules, atria) is missing.

Another frequently mentioned factor in the effort to increase PA and so fitness of children and youth is transport stimulation. Building a network of safety roads for walking and cycling nearby schools for independent children's transport to and from school was recommended by Ipsos-MORI (2004) and Moudon & Lee (2003). On necessity to improve knowledge of traffic rules and traffic education, as an element of safety during transport not only in schools, alert Boarnet et al. (2005). Increase active transport (walking, cycling, rollerblading, etc.) stimulates children to PA and if it carried out with other children then has socialization effects. EHHI (Logstrup, 2001) supports preference for walking and cycling as an important instrument of prevention against obesity and cardiovascular disease in the children's and youth's lives. Many studies confirm that environmental stimuli play an important role in the PA of children and youth and in general it is recommended to ensure appropriately large and safe area for playing and building up sufficient network of courts (Logstrup, 2001; Sallis et al., 2001; Barnett, O'Loughlin, Gauvin, Paradis & Hanley, 2006).

Sallis, Proschaska & Taylor (2000) point to a gradual change in the character of the housing of modern families, which leads to a reduction of the achievable space for PA of children. PA is very important factor of healthy life style, children fitness developing and

prevention of modern deseases. With effort for creation an optimal environmental conditions which suport PA it can be expected a positive effects on health in future adult population.

CONCLUSION

Although the children from Bosnia and Herzegovina have made in environmental stimulation generally lower levels than children from the Czech Republic, the results of individual subtests Eurofit test show a higher level of physical fitness. However the difference between the two groups is not statistically significant. The limits of study are small range of research sample and the difference in the average age of the groups (sample from Bosnia and Herzegovina was about 0,5 years older). It can be recommended to implement a similar research on a larger research sample obtained from various locations in the respective countries. Further research could be focused on the comparison of the primary schools curricula and the content of programs of educational fields at universities, aimed at education of future physical education teachers.

Improving the conditions for the inclusion of other organizational types of physical education in school movement regime is completely within the competence of school in both countries. With ensuring appropriate condition for quality school movement regime it can be expected children's higher motivation for PA in and out of school and graduadly increase their physical fitness. In physical education scope, it is necessary to make children familiar with the possibilities of PA in a different environment not only in school but also in nearby of the school (e.g. park, forest, playground, swimming pool, ropes course, in-line and skateboard area etc.). In this manner, it is necessary to extend the education in undergraduate and postgraduate studies for physical education teachers. It is necessary to develop teachers' didactic competences in future and increase teaching skills in the context of current needs for improvement of physical education didactic process.

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KOMPARACE ÚROVNĚ VYBRANÝCH POHYBOVÝCH SCHOPNOSTÍ DĚTÍ V BOSNĚ A HERCEGOVINĚ A V ČESKÉ REPUBLICE V KONTEXTU ENVIRONMENTÁLNÍCH PODMÍNEK K POHYBOVÉ AKTIVITĚ

SÚHRN

Inklinace nejmladších věkových kategorií populace k inaktivitě je dávána do souvislosti s nárůstem ortopedických onemocnění, nadváhy a obezity a kardiovaskulárních onemocnění u dospělé populace nejen v České republice. Ve snaze zjistit příčiny tohoto stavu je sledován i vztah a vliv environmentálních faktorů na objem a intenzitu pohybové aktivity (PA). Cílem předložené studie byla komparace environmentálních stimulů k PA a úrovně vybraných pohybových schopností dětí ve věku 9–11 let, a to v Bosně a Hercegovině a České republice. Dílčím cílem bylo posoudit PA sledovaného souboru z hlediska intersexuálních diferencí. Výzkumný soubor tvořilo 126 dětí ve věku 9-11 let z vybraných regionů sledovaných zemí. Úroveň pohybových schopností dětí byla zjištěna prostřednictvím EUROFITtestu, environmentální stimulace k PA dotazníkem ESPA (Environmental Stimulus for Physical Activities) (Renson & Vanreusel, 2005). Z výsledků vyplynuly signifikantní rozdíly v celkovém skóre environmentální stimulace k PA mezi dětmi z Bosny a Herzegoviny a z České republiky. Chlapci z Bosny a Herzegovina vykazují signifikantně lepší výsledky než chlapci z České republiky v testech EU-T2 - Plate tapping ($p<0,001$), EU-T3 - Sit and reach ($p<0,02$), EU-T6 - Sit - ups ($p<0,01$) and EU-T6 - Shuttle run 10x5 m ($p<0,002$). Dívky z Bosny a Herzegoviny dosahují lepších hodnot než dívky z České republiky v testu EU-T2 - Plate tapping ($p<0,01$). Při komparaci měřených pohybových schopností z hlediska intersexuálních rozdílů vykazují dívky z obou sledovaných zemí lepší hodnoty v testech EU-T1 - Flamingo balance test and EU-T3 - Sit and reach ($p<0.05$) než chlapci. Chlapci naopak dosáhli signifikantně lepších výkonů v EU-T4 - Standing broad jump a EU-T6 - Sit - ups ($p<0.05$). U obou sledovaných souborů se projevila signifikantní závislost mezi prostorovou stimulací k PA a testem Standing broad jump a také Flamingo balance test ($p<0.05$). Byl

prokázán vztah mezi prostorovou stimulací and úrovní vybraných pohybových schopností. Vztah mezi materiální stimulací and úrovní pohybových schopností nebyl zjištěn. Na základě zjištění lze doporučit u žáků středního školního věku (8–11 let) diferencovaný přístup z hlediska intersexuálního jak při stimulaci k PA, tak při rozvoji pohybových schopností.

KĽÚČOVÉ SLOVÁ: eviromentální stimuly, dotazník, pohybové schopnosti, mladež.

THE INTEREST OF THE HIGH SCHOOL PUPILS IN STARA LUBOVNA TO WINTER SPORTS

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SUMMARY

The authors are publishing what is the interest of the high school pupils in Stara Lubovna to winter sports. Questionnaires were used as the research method and they consisted of 21 questions. The research sample contained 202 pupils (121 boys and 81 girls) from the 5 high schools in Stara Lubovna. Authors presented results in figures, following by discussions. From the results it can be seen that high school pupils in Stara Lubovna have possitive relationship to winter sports. Selected pupils voted downhill skiing as much more preffered winter activity, altough snowboarding is more popular in terms of attractivness.

KEY WORDS: high school pupils, winter sports.

INTRODUCTION

In addition to a beneficial health impact, winter sports provide also memorable aesthetic and emotional experiences. Exploration of its beauty, enjoyment of harmonic motions, overcoming of difficulties – this all is brought to people by winter sports (Hellebrandtová - Roučková, 2011).

Skiing and other winter seasonal activities are playing an irreplaceable role in improving functional movement of people from the earliest age (Veisová, 2004).

According to Michal (2001, 2002), Bartík (2009), Gorner – Starší (2001), skiing is considered as one of the healthiest sports. It is not because of the environment,where the skier moves, but also because of the versatility of movement, which is needed.

Hellebrandtová - Roučková (2011) suggests that skiing practised as a "family sport" during the free time is excellent for family relationships, because of the time spent together.

Nowadays, it can be seen in many ski resorts that more and more people found an alternative to downhill skiing. Most often they are young people who cruise the slopes on a snowboard (Michal, 2012).

Based on the evaluation in terms of health, educational and motor aspects skiing, snowboarding, along with swimming and hiking belong into groups that correspond to physiological criteria recommended physical activity and they have effective impact on health and fitness of young people (Michal, 2006).

Similarly, Nemec (2004) has the suggestion which states that skiing but also other winter activities put increased demands on all functions and systems of the body.

AIM

The main aim is to present the interest of the high school pupils in Stara Lubovna to winter sports.

METHODOLOGY

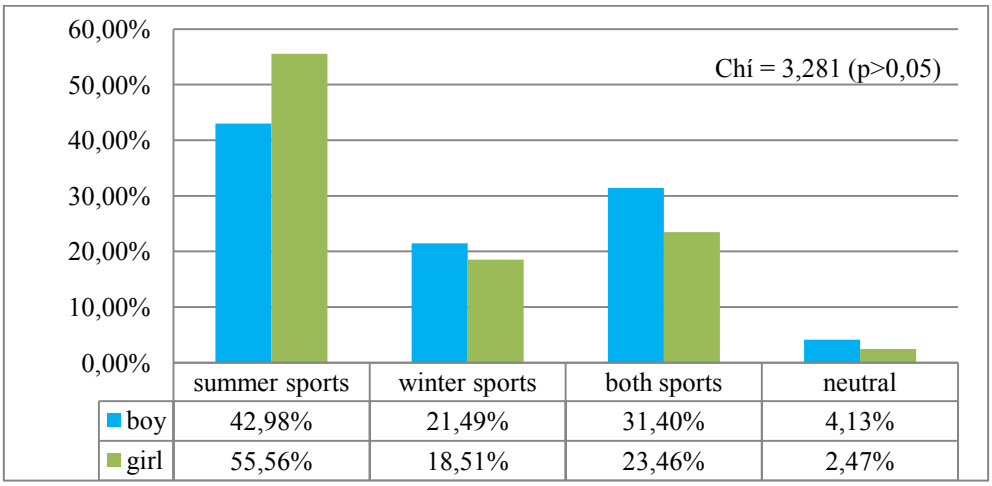
Questionnaires were used as the main method of our research. The questionnaire was designed for high school pupils in Stara Lubovna. It was anonymous. The focus was on gathering the views and interests of the pupils to winter sports, teaching and implementation rate of physical activities in nature, focusing on winter sports. It contained 21 questions, of which 3 were focused on the characteristics of the survey sample. Answers were presented only for selected questions.

The research was conducted in April 2013 at all high schools in Stara Lubovna. Total number of the schools involved in the research were 5. The research sample consisted of 202 students. There were 121 boys (59,90 %) and 81 girls (40,10 %). Individual responses were divided in terms of intersex relations (between boys and girls).

RESULTS AND DISCUSSION

At the beginning of the research, we were interested in case, if selected high school students in Stara Lubovna prefer more winter sports or summer sports, or both in the same way. As it is indicated in Figure 1, both sexes prefer summer sports than winter sports. Summer sports are more prefered by girls (55,56 %) than by boys (42,98 %). In terms of popularity of sports, 31,40 % of boys and 23,46 % of girls reported both, winter and summer sports, with the same popularity. 21,49 % of boys and 18,51 % of girls prefered winter sports than summer sports. The neutral attitude toward both types of sport has 7 pupils. We can

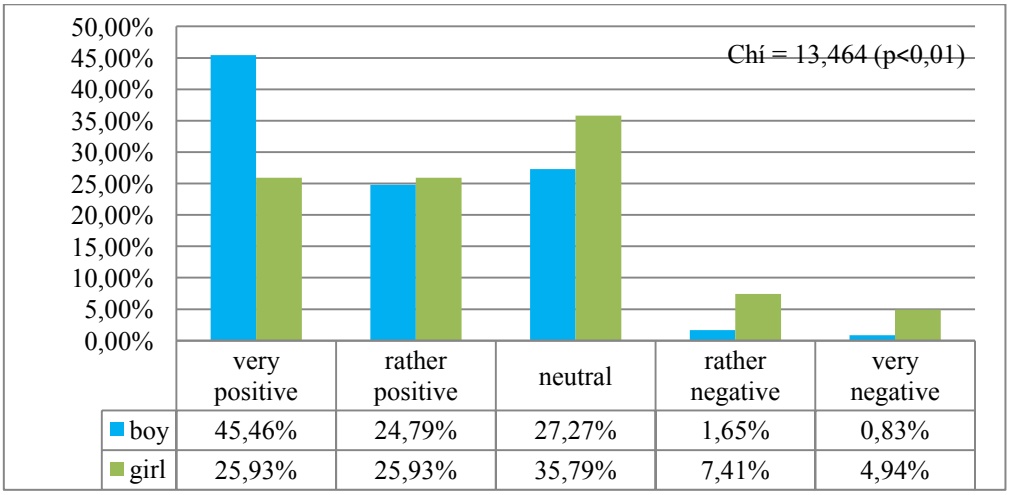
conclude that the majority of students in the survey sample have a positive attitude towards sport, which is this gratifying detection.



	summer sports	winter sports	both sports	neutral
boy	42,98%	21,49%	31,40%	4,13%
girl	55,56%	18,51%	23,46%	2,47%

Figure 1 Kinds of sports prefered by pupils

We were investigated in the questionare, what are the realationships of the pupils from the related high schools to winter sports. The results are presented in Figure 2. Very positive attitude was expressed by 45,46 % of boys and 25,93 % of girls, a positive rather than a negative 24,79 % of boys and 25,93 % of girls. Girls frequently took a neutral attitude to winter sports, though this response indicated to 35,79 % of girls. Neutral relationship to winter sports attracted 27,27 % of boys. Negative or very negative attitude to winter sports has only 2,48 % of boys and 12,35 % of girls, making a total of 13 pupils.



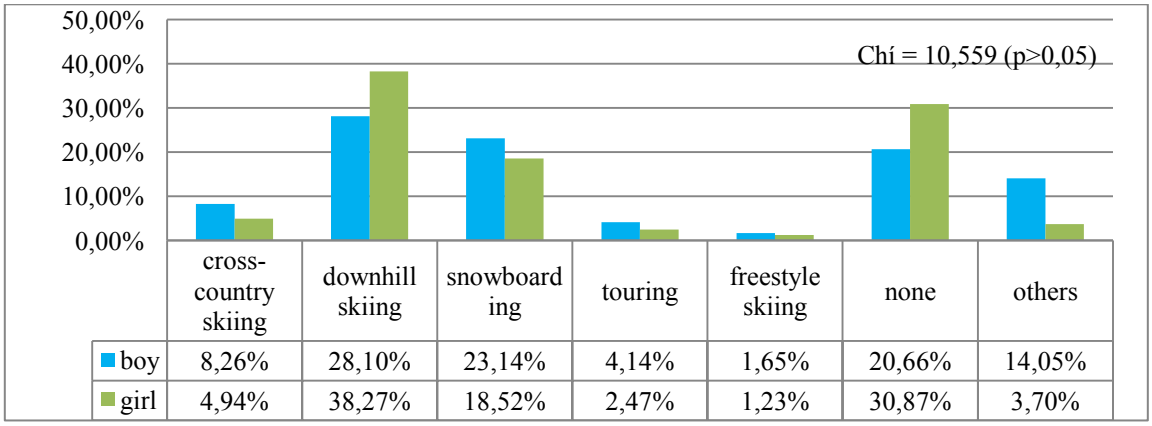
	very positive	rather positive	neutral	rather negative	very negative
boy	45,46%	24,79%	27,27%	1,65%	0,83%
girl	25,93%	25,93%	35,79%	7,41%	4,94%

Figure 2 The relationship of the pupils to winter sports

The pupils of high schools in Stara Lubovna prefer the summer sports than winter sports. It´s very positive, that more than 70 % of boys and more than 50 % of girls have a positive relationship to winter sports. Based on the results we can conclude that winter sports

have a great popularity among youth, which is a pleasure and good news for teachers of physical education and sport. At this point of view we had statistically differences between the responses of boys and girls at the significance level of $p<0.01$. Similar results had been reached by Beťák (2012), but in the research, girls had further more positive attitude to winter sports (over 74 %) compared with our current detection (over 50 %).

Furthermore, we were interested in question, which is the most popular winter physical activity by high school pupils in Stara Lubovna during their free time. Pupils had the choice of the 7 possible responses. In the choice of „others" they could also write down the most favourite winter physical activity they practise and was not among the given options.



	cross-country skiing	downhill skiing	snowboarding	touring	freestyle skiing	none	others
boy	8,26%	28,10%	23,14%	4,14%	1,65%	20,66%	14,05%
girl	4,94%	38,27%	18,52%	2,47%	1,23%	30,87%	3,70%

Figure 3 The most favourite winter sport activity, practising by the pupils in their free time

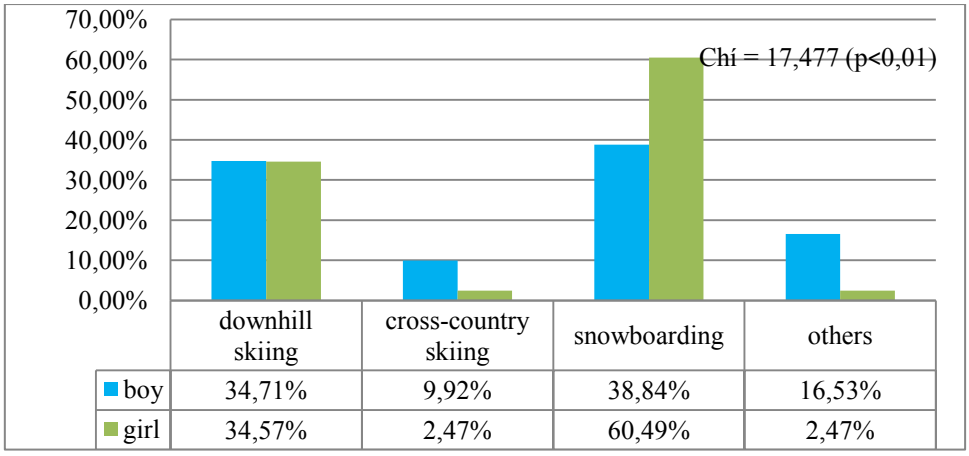
From the Figure 3 it´s clear tha the most preferable physical activity for both sexes is downhill skiing practising during their free time, with more than a quarter of boys and more than a third of girls chosing this activity. Similar results were found Michal (2011), although the research was done in primary schools. The second preferable winter physical activity for boys is snowboarding, which is practising by 23,14 % of pupils. A little surprise is that 30,87 % of girls said, they are not doing any sport in their free time. Within the "others" section, the most frequently reported activities were ice-hockey and cruising, which were reported only by boys, while girls reported only ice-skating.

The next question we wanted to know was which one of the winter sports: downhill skiing, cross country skiing, snowboarding or ,, others " is the most attractive for high school pupils. Based on the results, the most attractive winter sport is snowboarding for boys and girls, too. The surprise is that snowboarding is more attractive for a greater percentage of girls (60,49 %) than boys (38,84 %) (Figure 4). Similar results had been reached by Beťák (2012), which provides higher attractiveness of snowboarding over other winter sports, while in his research, snowboarding were attractive for the most than 74,32 % of girls and 50 % of boys.

Almost equal number of boys and girls deemed most attractive downhill skiing (34,71 % of boys and 34,57 % of girls). At this point of view we had statistically differences in the responses of boys and girls at the significance level of $p<0.01$.

Interesting is the detection that pupils prefer downhill skiing in their free time (Figure 3), but the most attractive sport for them is snowboarding. This might be caused by getting more media coverage of the sport.

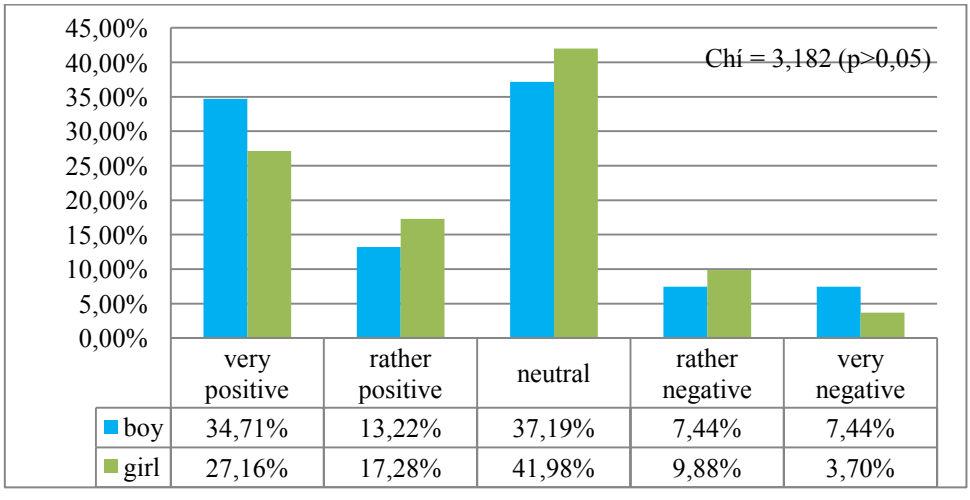
The obtained results confirm the great attraction of snowboarding, which is the main interest of the Modrák - Nemčík (2006).



	downhill skiing	cross-country skiing	snowboarding	others
boy	34,71%	9,92%	38,84%	16,53%
girl	34,57%	2,47%	60,49%	2,47%

Figure 4 Atractiveness of the winter sports to pupils

Within the research, we investigated the relationship of the high school pupils in the Stara Lubovna to downhill skiing. In Figure 5 we can see, that the most respondents have a neutral relationship to downhill skiing (37,19 % of boys, 41,98 % of girls). This reason may be caused, as we stated in Figure 4, by the current increase in attractiveness of snowboarding. Very positive attitude to downhill skiing showed 34,71 % of boys and 27,16 % of girls. We consider positive detection that very negative attitude to downhill skiing has only 12 pupils.



	very positive	rather positive	neutral	rather negative	very negative
boy	34,71%	13,22%	37,19%	7,44%	7,44%
girl	27,16%	17,28%	41,98%	9,88%	3,70%

Figure 5 The realtionship of the pupils to downhill skiing

CONCLUSION

The results, which were presented are documenting what is the relationship of the high school pupils in Stara Lubovna to winter sports and exercise.

We found out the positive attitude of 62,87 % of the high schools pupils in Stara Lubovna to winter sports by asking questions from the questionaire. The most preferable winter sport physical activity is downhill skiing, following by snowboarding. Based on our results we agree with the suggestions of Modrák - Nemčík (2006), who talk about snowboarding as a sport, that is fast growing and very popular for youth, by conecting two dynamic factors (the principle of freedom and autonomy) and speed at a certain dose of adrenaline . This was confirmed by the fact that in terms of the attractiveness of the selected high schools pupils in Stara Lubovna, snowboarding was the most attractive sport (47,53 %).

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ZÁUJEM ŽIAKOV STREDNÝCH ŠKÔL V OKRESE STARÁ ĽUBOVŇA O ZIMNÉ ŠPORTY

SÚHRN

Autori v príspevku prezentujú aký je záujem žiakov stredných škôl v okrese Stará Ľubovňa o zimné športy. Použitou výskumnou metódou bol dotazník, ktorý pozostával z 21 otázok. Výskumnú vzorku tvorilo 202 žiakov (121 chlapcov a 81 dievčat) 5-tich stredných škôl v okrese Stará Ľubovňa. Z výsledkov, ktoré autori prezentujú v obrázkoch s následnou diskusiou, vyplýva pozitívny vzťah žiakov stredných škôl v okrese Stará Ľubovňa k zimným športom. Najradšej vykonávanou zimnou pohybovou aktivitou pre daných žiakov je zjazdové lyžovanie pred snowboardingom, aj keď z pohľadu atraktivity sa pre žiakov ako atraktívnejší javí snowboarding.

KĽÚČOVÉ SLOVÁ: žiaci stredných škôl, zimné športy.

PUCK CONTROL IN RELATION TO THE SUCCESS OF THE TEAM IN THE GAME OF A PENALTY KILL OF AN ICE HOCKEY PLAYER

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SUMMARY

In this research we have focused on the detection of differences in puck control in penalty kills in relation to their success in ice hockey matches in the Slovak Extraliga seniors League. We have been watching matches of the Slovak hockey league and using an indirect research, in which we analyzed the 75 games in penalty kills within 5 teams in terms of puck control. To find significance of the differences in the puck control of the successful and unsuccessful penalty kills we used the Mann-Whitney U-test. We evaluated the differences at 5% and 1% level of statistical significance. We found that the success of the team in the game in a penalty kill was significantly linked to the length of the puck control and check that the puck control of the team in the game in the penalty kill is relatively evenly distributed in all three zones. The work brought results, which can be useful in making training process, increase the performance of team game in the match, and to some extent, to enrich the theory of the game of ice hockey.

KEY WORDS: ice hockey, puck control, penalty kill, the success of the team.

INTRODUCTION

Ice hockey is currently among the fastest, toughest and most dramatic team sports in the world. One of the key factors which influence the outcome of the match in an ice hockey game in a match are penalty kills and power plays. These two factors influencing the result of a match in ice hockey are among the crucial, because very often a goal was given in power play. Coaches realise the importance of a power game as well as the players themselves.

At present there are even formed special formations of players for power plays, but also for the games in penalty kills.

The team in power play has an advantage in the number of players on the ice and it is therefore likely to have the puck under control for a long time and vice versa; team in the game in penalty kill aims to control their opponent to shorten their advanateg and thus extend theirs. In sports games authors have focused on researching indicators, respectively game performance indicators.

For example, Hianík (2010) watched the game performance indicators to the outcome of the match in the cooperative relationship of the handball and found that the outcome of the match to a considerable extent is linked with the success rate of attack and counterattack in the offensive phase of the game, and from the defence of a progressively attack and counterattack in the defensive phase of the game.

Potocký & Mačura (2009) pointed out that the women's U19 World Cup in 2007 in basketball; all victoires were linked with the success rate of assists, the shooting percentage for two points and the number of attacks and in defense. Instead Jones (2009) argues that the success of the team in an ice hockey game has the effect of the benefit of a domestic environment, which followed up on similar studies in basketball.

In ice hockey, Andrejkovič (2008) studied a similar issue and discovered a significant link between the solution to the game situation and as a result of a 1: 1 match in the category of adolescents. Bukač et al. (1980) in the analysis of games from MS and ME came to the conclusion that the winning team had more success and effectiveness in shooting.

The winning team needed to reach the goal into the opponent's goal on average 2,6 chances, slaughtered up to 7,3. The winning team were also successful in the power play, while the power play game was played more frequently it took an average of one minute less to achieve a goal. They also managed to shoot goals in penalty kills, they were more successful in establishing attacks from the defence line and achieve more attempts on goal. The author also pointed out that the influence on the goal keeper was greater in the ice hockey game outcome, but on the other hand, the number of face-off did not affect the success of winning the match.

Gaming performance indicators which have a bearing on the outcome of the match which we can evaluate at the same time are many. One of them, which is very little explored, ice hockey is the control of the puck. In the other sports games we research on the subject in sufficient quantity. For Example. Jones, James, Mellalieu (2004) showed in their reserach that control of the ball in footbal is linked to the success of the team in a match.

Argudo, Ruiz, Ignacio (2008) found that in water polo in the male and female category there is quite a significant difference in dealing with the game-out micro situations with and without the control of the ball between the winning and defeated team.

Van Rooyen, Noakes (2006) pointed out that at the 2003 Rugby WORLD CUP teams frequently more scored when they were able to keep the ball under control more than 80 seconds. Keeping the ball under control as long as possible has shown as critical control measure.

Bazanov, Hajland, Vôhandu (2005) found that statistically there is significant difference between the control of the ball in the offensive zone, between the winning and the defeated team in basketball, similarly Sampaio and Rio (2003) in the possession of the ball came to a same conclusion.

In ice hockey, this issue was explored by Huntata and Zapletalová (2011), who watched the puck control in thirds (parts of the game). On the basis of the results reached they came to a conclusion that in the third, which ended with the victory of a single cooperative, noticed significant differences in favour of the winning team and in total puck control and puck control in the attacking zone. In the third, which ended with a draw, the differences in overall puck control between the teams were not noticable, not even in the various zones.

In our project, we have decided to extend this knowledge of penalty kills in ice hockey games. Therefore, this paper should also indicate to Slovak ice-hockey coaches, which direction is ice hockey heading at present.

AIM

The aim of this paper is to find the differences in puck control in play in a penalty kill in relation to their success in ice hockey matches in the Slovak Extraliga seniors.

METHODOLOGY

The methodology for this research was carried out using ex post facto. Timing followed a course of watching a one-off research process. In terms of the observed selection it is a one off selection of teams. When setting this model we used the technique of a selective sampling. The research consisted of 5 senior teams in the highest Slovak competition in ice hockey, The Slovak extraliga in season 2011/2012 where teams ended in the final table up to the eighth place: HK Dukla Trenčín, HC US Steel Košice, HC 05 Banská Bystrica, HKM Zvolen, HC Nitra.

To register the selected indicators of the gaming performance of the teams, we used the method of indirect observations from a DVD recording and a professional assessment.

Selected indicators of the gaming performance of the team are in our view decisive in terms of the success of the team in the game, in our case, the success of the team in the game in a penalty kill. Variables in a penalty kill: the number of exclusions, the number of penalty minutes, concieved goals in penalty kills, succeess in defence in penalty kill i.e. the effectiveness in the game during a penalty kill.

Puck control indicators dring a penalty kill was a summary off: the puck control during a penalty kill, puck control in individual zones (puck control in the defensive zone, the puck control in the neutral zone, the puck control in the attacking zone).

Puck control during a game in a penalty kill was recorded with a stop watch, which show the playing time of the match and was continuously displayed on a DVD record. The times were recorded in seconds with a precision of a second. With any changes in the puck control between teams we stopped and recorded it into our recording sheet; and we entered a time in which there was a change in puck control. In the same way we have recorded times in terms of location in each of the zones of the game. In the transition from zone to zone we recorded that and writting it into our recordings. Consequently, we use these times to be counted separately for each team and each zone.

Under the puck control we used one player that had the puck in his authority from one team (has it under control), and then made a conscious gaming activity, such as keeping the puck, pass, head, bypassing the sighting of the opponent, etc.) In such situation, in which the player only touched the puck and didn't do anything with it a conscious activity, such as in a duel on the puck, blocking shots, passes, we did not consider as a puck control measure.

Under the puck control, we further set a different game situation, in which players did not have immediate puck control, but were in an offensive stage of the game, such as a pass, firing a puck from the defense zons. A change of puck control was recorded when a team who previously had possesion of the puck gained it into control and moved from the defensive to the offensive phase of the game, and vice versa, which should be under the puck control of the team that lost the puck and went from offensive to defensive stage of the game.

In situations where it was not clear which of the team has the puck under control (fights for the puk) we recorded timings for the team which had the puck control prior to this situation.

In possesion of the puck control, we further considered situation such as during of a penalty kill occurring in the games where a player of the team in a penalty kill fired the puck

from the defensive zone to the middle zone or the offensive zone and the control of the puck was completed when the puck touched the player who played the power play.

When processing and evaluating the obtained empirical data we added some basic logical methods – analysis, synthesis, inductive and deductive methods we have also practiced the basic statistical methods. In our research we used basic statistical characteristics of median, modus, with minimum value, maximum value, and a variable margin. To assess differences between successful and unsuccessful games in the puck control in penalty kills, we used the Mann-Whitneyho U-test. The significance of the differences between variables, were assessed at 5% and 1% level of statistical significance.

In individual parts of the game between succesful and unsuccesful penalty kills we used a percentage analysis through the U-test, because when scoring a goal in a penalty kill the time of the game changes.

RESULTS

Overall we watched 75 games in penalty kills 5 teams of the Slovak League. We have reached the following result.

Table 1 The value of each individual team during penalty kills in percentages

	Time PK (s)	Time PC (s)	Time PC (%)	Average Time PC (s)
BB	1639	331	20%	22,1
TN	1729	323	19%	21,5
KE	1594	324	20%	21,6
NR	1699	416	24%	27,7
ZV	1528	443	29%	29,5
Average	1637,8	367,4	23%	
Total	8189	1837		

Legend: PK- penalty kill PC- puck control

The total time of penalty kills was 8189 seconds; HK Dukla Trencin team spent most time being under penalty kills 1729 seconds and the least time in seconds spent was team HKM Zvolen, which reached the time in penalty kills of 1528 (Table 1). The average time spent in the game in one team represented a penalty kill of the value of the 1637,8 seconds. In the table below, the total time of the puck control of each team was in seconds, or in units of

time, but also as a percentage. For the longest time under the puck control of team HKM Zvolen with a percentage term amounted to 443, 29% of the total time spent in penalty kills of these games and at the same time the figure was the highest among all five teams.

On the other hand the shortest times recorded with puck under control was HK Dukla Trencin with 323 seconds- 19%. This value was the lowest value of participant teams. Another measurement of recorded values in this table are the average values of the puck control of each team for one game in a penalty kill, with the highest value we have seen for ZV 29,5 seconds and lowest in TN and it's total with a 21,5 seconds. Total time of 1837 seconds, which was reached by the average value per one squad was 367,4 seconds.

Table 2 Puck control of the team in the game under penalty kill in check in different zones

Penalty Kill (PK)							
	Total PC	AZ		NZ		OZ	
	(s)	(s)	(%)	(s)	(%)	(s)	(%)
BB	331	101	31	115	35	116	35
TN	323	113	35	102	32	109	34
KE	324	109	34	105	32	111	34
NR	416	163	39	120	29	135	32
ZV	443	145	33	139	31	160	36
Total	1837	631	34	581	32	631	34
Average	367	126	34	116	32	126	34

Legend: PK- penalty kill PC- puck control AZ- attacking zone NZ- neutral zone OZ- offensive zone

In Table 2 we show values of puck controls in games under penalty kill of each individual zone. The values are in seconds, but also as a percentage. The highest value of PC in the attacking zone amounted to 163 s to team NR with 39%. The lowest value of PC in the attacking zone we have seen for team BB (101), 31% respectively. As far as the middle zone the highest values of PC were found for ZV (139 s), or 31%, but did not represent the highest percentage value. The highest value of PC in the middle zone from a percentage value was achieved by team BB 35% (115s). The lowest value of PC in the middle zone we recorded for TN (102s) or 32%, but is not the lowest percentage value. That was recorded for NR namely 29% (120 s). In the defensive zone, we have the highest readings found in the team from ZV with 160 s (36%), lowest in TN 109s (34%), but did not represent the lowest percentage

value. We measure that in NR at 32% (135s). The lowest measured value of 581s with puck control was in the middle zone. In both attacking and defensive zone, we find the same value of 631s measured; and that means the highest values were measured in penalty kills in both of these zones.

Measuring the percentage of puck control in each zone during all games we can conclude that the smallest percentage of (32%) we have seen in the middle zone and the highest in the attack (34%) and in the defensive zone (34%).

Table 3 Success rate of individual team in penalty kills (PK)

	Number PK	Number of goals	Success in penalty kills	Number of concieved goals
BB	15	3	80%	0
TN	15	3	80%	0
KE	15	3	80%	0
NR	15	3	80%	0
ZV	15	4	73,33%	0
Average	75	16	79%	
Priemer	15	3,2	78,66%	

Legend: PK- penalty kill

In Table 3 we present the values that are associated with the correct answers, or the efficiency of teams in penalty kills. The first value referred to in the table means the number of games played each of the teams, which represents 15 games per team. Another value is the number of concieved goals of each team in 15 games under penalty kills and with it the success rate and overall efficiency. The lowest % and therefore the highest success rate in conceiving goals within the 15 games were teams of BB, TN, NR and conceived 3 goals, which means 80% success rate. Team concieving 4 goals represents a success rate of 73,33%. A total of 75 games in penalty kills is 16 goals, which together amounted to 79% success rate. The average for one team was accounted for 3,2% conceived goals of an average success rate of 78,66% in penalty kills. In addition, in 75 games in penalty kills not one team has achieved to score.

With some successful games in penalty kills with puck control there was value amounted to over 50% in one case to 51% and in another case 55% of what it was the largest

recorded value at the same time. The minimum values of PC is 0% of a total number of 5.

The lowest values were measured during the unsuccessful games in penalty kills. This measured value was counted 5 times and during succesful penalty kills. The average value of PC success in undermining the games amounted to 24%, which is 2 times more than the average value of the PC failed in undermining the games (12%).

Table 4 Indicators of puck control during games in penalty kills (U-test)

Penalty kill (PK)		
	Succesful	Unsuccesful
∑ (s)	1667	170
∑ (%)	1389	198
Me	13	23
Modus	0	28
Min	0	13
Max	39	55
V_R	39	42
U – test	3,89	
	p < 0,01	

In Table 4 we present statistical data comparing the puck control of the successful and unsuccessful games in penalty kills (the total amount of the KP, standard deviation, median, mode, maximum, minimum, variable) as well as the level of statistical significance which we calculated using Mann-Whitneyho U-test. The result of the U-test are confirmed by statistically significant differences in the puck control in successful and unsuccessful penalty kills at 1% level of statistical significance.

CONCLUSION

The aim of this paper was to identify differences in puck control in penalty kills in relation to their success in ice hockey matches in the Slovak Extraliga seniors. The record sheet was set to be transparent, simple and adapted to the evaluation of the phenomenon, which teams were partly during the game in penalty kill, puck control, puck control in each of the zones, the number of concieved goals, etc. Then we carried out indirect observation of 75 games in penalty kills of the highest Slovak Ice Hockey League teams of five and we created

DVD records. After completion of the previous tasks, we evaluate the results obtained through the use of mathematical and statistical techniques and methods of logical conclusions.

On the basis of using the Mann-Whitney U-test, we found out that under puck control during a game in penalty kill there has been significant differences in control of the puck during a successful and unsuccessful games. These differences were statistically significant at the 1% level of statistical significance.

Also in puck control in penalty kill we observed the localization in terms of individual zones. As a result it is not possible to argue which zone is dominant in this respect. In puck control , we found a ratio of 34%-32%-34% (offensive zone – neutral zone – defence zone).

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KONTROLA PUKU VO VZŤAHU K ÚSPEŠNOSTI DRUŽSTVA V HRE V OSLABENÍ V ĽADOVOM HOKEJI

SÚHRN

Výskum sme uskutočnili nepriamym pozorovaním zápasov Slovenskej extraligy seniorov, v ktorých sme u 5 družstiev analyzovali 75 hier v oslabení z hľadiska kontroly puku. Významnosť rozdielov v kontrole puku úspešných a neúspešných hier v oslabení sme zisťovali neparametrickým Mann-Whitneyho U-testom. Signifikantnosť rozdielov sme vyhodnocovali na 5% a 1% hladine štatistickej významnosti. Zistili sme, že úspešnosť družstva v hre v oslabení výrazne súvisí s dĺžkou kontrola puku a že kontrola puku družstvom v hre v oslabení je pomerne rovnomerne rozložená do všetkých troch pásiem. Práca priniesla výsledky, ktoré môžu byť užitočné pri zefektívňovaní tréningového procesu, zvyšovaní hernej výkonnosti, vedenia družstva v zápase a v určitom rozsahu obohatiť teóriu herného výkonu v ľadovom hokeji.

KĽÚČOVÉ SLOVÁ: ľadový hokej, kontrola puku, hra v oslabení, úspešnosť družstiev.

BODY POSTURE OF ELEMENTARY SCHOOL PUPILS

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SUMMARY

The aim of our work was to point out the detected current state of body posture of 111 elementary school pupils in Hnusta. According to the examination of our sample and the results obtained, we can conclude that the 58,83% of second stage pupils had poor body posture taking into account the percentage mean. Good body posture was recorded in 61,05% of pupils.

KEY WORDS: body posture, evaluation of body posture, elementary school pupils.

INTRODUCTION

One of the primary objectives of physical education in elementary school of second grade[1] is to contribute to strengthening health, building up physical fitness and physical performance. It helps physically disadvantage pupils eliminate their health defects.

Proper body posture meets the requirements of not only aesthetic, but also energy - economic. Good kinetic co-ordination, which is economical, and consumption of energy for muscles is balanced, can be gained only with proper body posture. Mental equanimity goes hand in hand with proper body posture. If the child is happy and well-being, he has a different body posture than uncomfortable, sad or terrified one. This child faces fatigue, mental states, and lack of physical activity, work or sport activities (Bartik, 2005). Body posture is guided by education and locomotive patterns. The cause of incorrect body posture can be a muscle imbalance or decreased muscle tonus. It may be, however, the functional disorders of the spine, which are accompanied by improper postural habits, poor movement habits.

A physical education teacher has an important role in the formation and strengthening of proper postural stereotype. His duty is to uncover not only causes of bad body posture, but

[1] **Author´s note: In Slovakia, second grade pupils are from 10 years old**

also eliminate them by suitable physical activities. He has to motivate students and teach them the importance to remove their malfunctions, due to their healthy development, aesthetic appearance, but also the working or sporting activities (Bartik, 2005). Body posture is individual and varies on many factors of internal and external environment. Many authors point out to worsening of body posture and the occurrence of support-kinetic system deviations as a whole (Jankovská, 1998, 2001; Jurašková-Bartík, 2010; Kopřivová 2005).

AIM

The aim of the research was to determine the general posture of second stage pupils of elementary school in Hnusta.

METHODOLOGY

Characteristics of examined group

Research sample consisted of 111 pupils who were willing to participate in anthropometric measurements, and in evaluation of body posture. Research was conducted at the end of September 2010 and was carried out as a part of physical education at elementary school, Klokočová 1, Hnusta.

Methods of obtaining and processing research material

Body weight measurements

Body weight was measured with digital scales with maximum weighing up to 120 kg, accurate to 0,5kg.

Body height measurements

Body height was measured with a wall-mounted anthropometer and triangle. The pupil stood straight with his back against the wall-mounted anthropometer, with his heels, gluteus muscles, back and head touching the wall. The head was in a straight position.

BMI Method (Janíková, 1998)

Body Mass Index (BMI) method is one of the methods to calculate the ideal body weight. BMI = weight (kg) divided by height² (m). Weight in the formula is given in kilograms and height in meters.

BMI range assessment:

Body mass index (00.0 <18.5) - BMI that is lower than 18.5 points may be marked as health problems. This medical condition must be consulted with the doctor who considers its seriousness and excludes or confirms any health problems. Lower BMI may be a cause of increased thyroid function.

Body Mass Index (18.5 <25.0) - pupils with ideal body weight

Body Mass Index (25.0 <30.0) - pupils with mild obesity, caused by lack of exercise or irregular diet

Body Mass Index (30.0 <40.0) - pupils suffering from obesity

Body Mass Index (40.0 <more) - pupils suffering from severe obesity

Method of body evaluation according to Jaroš and Lomička (Bartošík, Chudá 2000)

Evaluation is focused on:

I. Head and neck posture

II. Chest

III. Abdomen and pelvis tilt

IV. Back curve

V. Posture in the frontal position from behind

VI. Lower limbs

body parts are evaluated mark 1-4

Body posture is evaluated by the sum of points in paragraphs I. - V.:

I. Perfect body posture 5 points

II. Good body posture 6-10 points

III. Poor body posture 11-15 points

IV. Very poor body posture 16-20 points

Pupils with perfect and good body posture (5-10 points) have normal physical education lessons. Pupils with a score of 11-20 points attend physical education lessons aimed at health improvements.

Processing method of research material

Qualitative methods - Analysis, Synthesis

Quantitative methods - The arithmetic mean, the percentage evaluation

RESULTS

In the analysis and interpretation of research results, we focused on areas in which we investigated pupils` BMI, body posture deflections in individual parts of body, lower limbs deflections, and overall body posture of pupils.

Evaluation of BMI

BMI of pupils is stated in Table 1. Currently, both obesity and malnutrition significantly contributes to the wrong body posture so we included BMI calculation in the research area of our work, where we investigated pupils` current state of subcutaneous fat on the basis of their height and weight.

According to Figure 1, we can conclude that pupils who belong to the category to 18,5 points which forms the border over 50% are classified as very poor. Lower BMI may be a cause of increased thyroid function and I would recommend to these pupils a visit of general practitioner. Pupils belonging to the range of 18,5 to 24,9 account for 40,54% have an ideal body weight and the only thing to recommend is to maintain this weight. 6,31% of pupils fall into the category of mild obesity. Pupils with significant obesity are not present in the selected group. Overall, we can say that second stage pupils do not suffer from obesity, but we have to say that many pupils who belong to the category of very poor body posture have worse posture assessment as pupils with mild obesity, which was caused by insufficient muscle strength and muscle volume.

Table 1 Body Mass Index (BMI)

BMI		
	N	%
Less than 18,5	56	50,45
18,5- 24, 9	45	40,54
25- 29,9	7	6,31
30- 34,9	1	0,90
35- 39,9	0	0
over 42	2	1,80
Total	111	100

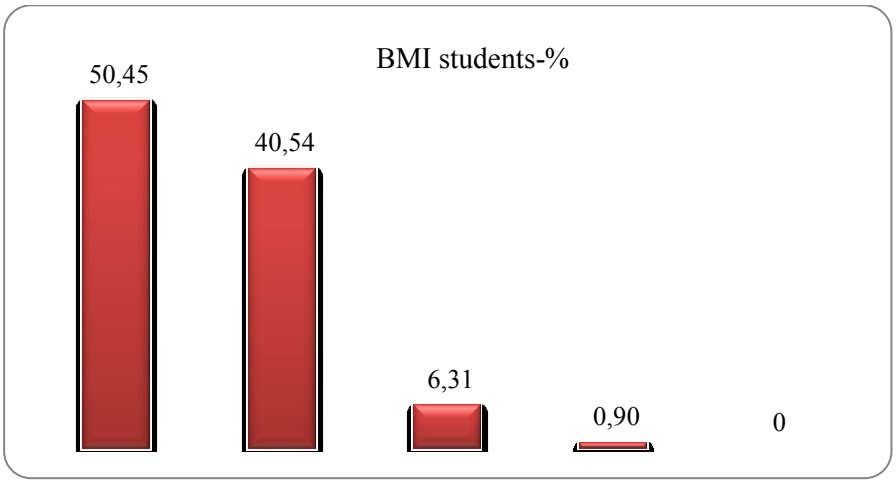

Figure 1 Body Mass Index (BMI)

Table 2 Evaluation of head and neck posture according to Jaroš and Lomička

grade	N	%
1	38	34,23
2	69	62,16
3	4	3,60
4	0	0,00
Total	111	100,00

Table 2 lists the percentage evaluation of head and neck posture of elementary school pupils. 34,23 % of pupils reached very good head and neck posture. 62,16 % of pupils reached good head and neck posture (grade 2 - neck slightly tilted forward about 10˚, looking ahead). 3,60 % of pupils had wrong head and neck posture. None of pupils reached very bad head and neck posture.

Table 3 Evaluation of chest posture

grade	N	%
1	26	28,86
2	77	85,47
3	8	8,88
4	0	0
Total	111	100

In our evaluation of chest posture (Table 3) we found out that 28,86% of pupils reached very good chest posture (grade 1 - chest is normal, well arched, chest curvature affects the

vertical, chest´s axis is vertical). Good chest posture (grade 2) reached 85,47% of pupils. Bad chest posture (grade 3 - flat chest, you cannot run the vertical, chest´s axis is vertical) before exercising gained only 8,88% of pupils. Very bad chest posture was not detected (grade 4 - vere chest deformations).

Table 4 Evaluation of abdominal and pelvic tilt

grade	N	%
1	36	39,96
2	60	66,6
3	15	16,65
4	0	0
Total	111	100

From the measurements (Table 4) we evaluated that 39,96% of pupils have a very good abdominal posture and pelvic tilt (grade 1 - abdominal wall is pulled, perfect posture of the pelvis, sacrum tilt to the vertical axis is 30°). 66,6% of pupils had good abdominal posture and pelvic tilt (grade 2 - small deviations, the abdominal wall slightly convex, sacrum tilt is 35°). Bad abdomen posture and pelvis tilt (grade 3 - larger deviations, rounded abdominal wall, sacrum tilt is 40°) had 16,65% of pupils.

Table 5 Evaluation of back curve from side

grade	N	%
1	6	6,66
2	14	15,54
3	77	85,47
4	14	15,54
Total	111	100

6,66% of pupils had grade 1 when evaluating back curve from the side. 15,54% of pupils had grade 2. Those pupils who had strongly rounded back or back with a slight curvature, got grade 3, this represents 15,54% of pupils. Grade 3 is a bad sign of head and neck posture from the side. Very large deviations (grade 4) had 15,54% of pupils (Table 5).

Table 6 Evaluation of body posture in the frontal position from behind

grade	N	%
1	39	43,29
2	27	29,97
3	45	49,95
4	0	0
Total	111	100

From the measurements (Table 6) we found out that 49,29% of pupils have excellent body posture in the frontal position from behind (grade 1). This means that symmetry of the hips and thoracoabdominal triangles is equal to the shoulder height, shoulder blades, which do not stand away. Grade 2 was got 29,97% of pupils. Permanent exsertion of one hip, one arm above and protruding blades (grade 3) were determined in 49,95%. Significant protruding blades, significant exsertion of one hip, asymmetry of thoracotoabdominal triangles (grade 4) were not diagnosed to any pupil.

Table 7 Evaluation of lower limb

grade	N	%
1	60	66,6
2	50	55,5
3	1	1,11
4	0	0
Total	111	100

In the evaluation of pupils´ lower limbs (Table 7), we did not experienced considerable deviations. Lower limbs in the correct axis, centre of pelvic, knee and ankle joint creates the vertical. Perfect arch of the foot is ranked with grade 1, which represented 66,6% of pupils. Pupils who had turned out or turned in their knees (3 cm) and slightly flat feet were ranked with grade 2. This grade occurred in 55,5% of pupils.

Table 8 Overall evaluation of body posture

grade	n	%
1	3	3,33
2	55	61,05
3	53	58,83
4	0	0
Total	111	100

Table 8 gives the overall evaluation of body posture. Grade 1 (perfect body posture) reached only 3,33% of pupils. Grade 2 (good body posture) got 61,05%.

CONCLUSION

The aim of our work was to highlight the findings about the current state of body posture of elementary school pupils in Hnusta. According to the examination of our sample and the results obtained that are presented in the figures, we can conclude that the 58,83% of second stage pupils had poor body posture taking into account the percentage mean. Good body posture was recorded in 61,05% of pupils. We recommend to teachers to teach and permanently remind their pupils the importance of proper body posture, proper seating, the importance of good body posture for their overall state of health. For teaching practice, we recommend to follow the functional state of support-kinetic system. We also advise to include balancing, power, compensation and stretching exercises in physical education lessons.

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DRŽANIE TELA ŽIAKOV 2. STUPŇA ZÁKLADNEJ ŠKOLY

SÚHRN

Cieľom príspevku bolo poukázať na zistení aktuálny stav držania tela 111 žiakov ZŠ v Hnúšti. Na základe vyšetrenia výskumnej vzorky a získaných výsledkov, môžeme konštatovať, že žiaci 2. stupňa ZŠ mali v percentuálnom priemere zlé držanie tela, čo predstavovalo 58,83 %. Dobré držanie tela sme zaznamenali u 61,05 % žiakov.

KĽÚČOVÉ SLOVÁ: držanie tela, hodnotenie držania tela, žiaci základnej školy.

RELATIONSHIP OF PUPILS OF PRIMARY SCHOOLS IN THE REGION DETVA TO PHYSICAL AND SPORTING ACTIVITIES AND THEIR IMPLEMENTATION

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SUMMARY

Author of this article presents the relationship pupils at primary schools in the region Detva to physical and sporting activities as well as to their implementation. Also the author of the article deals with the questions which activities are most often attended by pupils whether in school physical education and sports or extra-curricular school activity and also he deals with the frequency of their implementation. Research method used was a questionnaire used for the survey sample of 224 students (100 boys and 124 girls at four primary schools (1 village and 3 town schools) in the region Detva. Based on the identified results, which the author presents in the graphs, the work shows a positive correlation of primary school pupils to physical and sports activities. Among the most popular physical and sporting activities belong sports games before cycling and swimming.

KEY WORDS: physical and sporting activities, free time, primary school.

INTRODUCTION

Physical and sporting activities can significantly affect the physical development of the individual and increase his or her performance and reinforce his or her health. Physical activity constitutes a positive counterpoint to the current predominant sedentary lifestyles among children and youth who are a large part of the day sitting back there, not only in school, but many times during afternoons and evening in preparation for school education, or while watching TV, during communicating through social networks and working with computers. In this age period there is great interest in physical activity and this is also one of the most important needs of the child . During this period, however, there is also a decrease in physical activities and physical performance as reported Frömel - Novosad - Svozil (1999),

Pavlik (1999), Šíma et al . (1998), Sigmund et al. (2003), Chow - Fung (2005). To know the structure of motion interests of youth is important for the correct motivation of their physical activities.

Interests form a dynamic personality traits and are an integral part of its motivational structure , that is those factors that mobilize humans or encourage their activity (Končeková , 1996). Sport is gradually disappearing from schools especially in an organized form. We miss sports teams , fights , rivalries , cheering , sports atmosphere , education for self-esteem of our school , town, city or our state . According to Hrčka (1995) is a sport and recreational activity closely associated with leisure. For the basic form of sport for all is considered recreational physical education , recreational sport and tourism. One of the priorities of sport for all is the care of human health. Among the determinants of expected positive changes was also included physical activity, which attaches great potential to sustain an active health and should become part of our everyday life. Active health we understand much broader than just the absence of disease , bodily defects and weakening.

Currently, the lifestyle of students and young people varies greatly. Too technicized environment of these days is characterized by a lack of physical activity especially among children and youth. Times, when children spend time playing with friends is long over. Today, their interest focuses primarily on computing. Despite the fact that children have a positive attitude to physical activities, they do not pay enough attention to them during their free time. Important role in addressing this problem plays a physical and sport education in primary schools (Palička, 2013).

In the context of continuously declining interest of students and young people's physical activity, gets more significantly to the forefront motivational function and activation. The most important basis of student motivation are their needs. Apart from the primary needs, each pupil has a social needs. (Kollár, 2010).

Physical education and sport as well as extra-curricular physical education should lead and mobilize students to be more active, to develop their independence and freedom in their decisions. Therefore, in order to achieve the most satisfactory results in the free time of students is firstly important identifying of the direction of the interests of students and youth to individual physical activities and so consequently the help of schools, families, coaches, sports clubs and foremost of the state to create conditions for improving the situation in the area. With mentioned theme of identifying interests, attitudes, beliefs and relationships of youth to the physical education and sport as well as to physical and sports activites that are with them very closely linked in the past dealt also following: Frömel et al. (1999), Gorner -

Starší (2001), Michal (2002, 2011), Kollar et al. (2010), Bartik (2005, 2006, 2007, 2009), Bartik - Mesiarik (2009), Paugschová - Jančoková (2008) and other authors.

AIM

The aim of this work is to examine the relationship of pupils at primary schools to sport and sporting activities and their implementation in the region Detva.

METHODOLOGY

The research was realized in the school year 2012/2013. In total, 224 students participated in the research , the research sample consisted of 124 girls and 100 boys from four primary schools in the region Detva:

- Primary school of J. J. Thurza on the street A. Bernolák in Detva
- Primary school in the School street in Hriňová
- Primary school in Krivec in Hriňová
- Primary school of M. Kolibiar in Detvianska Huta

The main research method for obtaining data was indirect method of gaining facts - anonymous questionnaire containing closed questions designed to get overview of the studied sample and of activities of schoolboys and schoolgirls. For evaluating were used quantitative methods (sum, calculating of percentages) , qualitative methods (analysis, comparison) and logical methods .

RESULTS AND DISCUSSION

By the first question we investigated the popularity of sports and physical education for pupils of second level at selected primary schools. From the research results it is clear that more than 70 % of all respondents indicated the subject physical education and sports as a favorite (33,04 % of boys and 37,50 % of girls). Similar results in the area of investigation of the relation to the subject physical education and sports report also authors as Görner - Starší (2001), Bartik (2009). Among respondents were also those who dislike a subject physical education and sport: 2,68% for boys and also girls . Nearly a quarter (24,11%) of all students were indecisive and identified the answer „possibly“ (Figure 1). In spite of the increasing number of students, who don´t practice actively, and insufficient and often substandard conditions for the implementation of the educational process in the subject of physical

education and sport , in terms of our results and the results of other authors (Görner – Starší 2001, Michal, 2011) we can state, that this subject is still highly popular among other subjects.

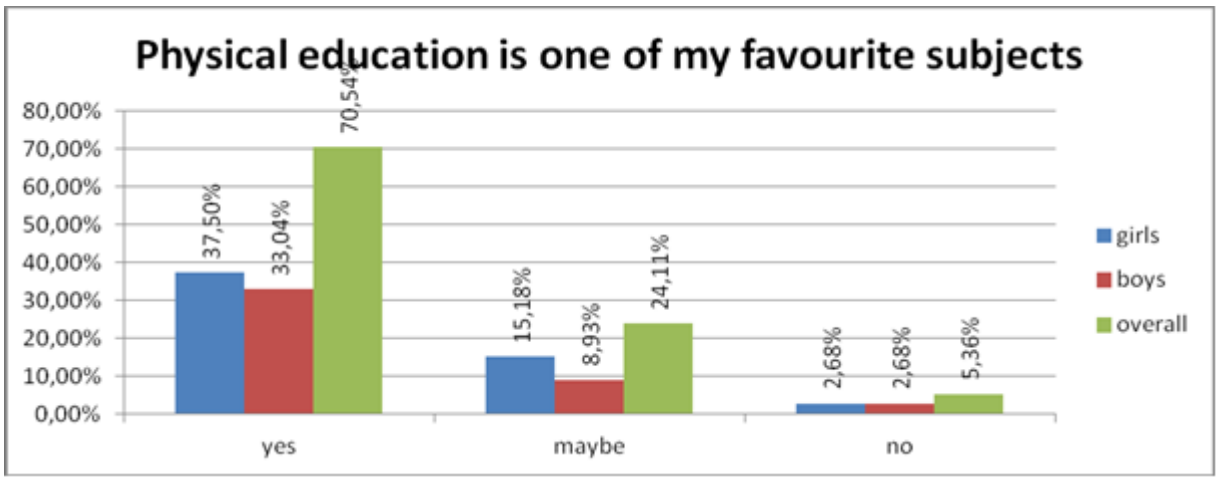

Figure 1 Physical education is one of my favourite subjects

From the evaluation of the second question, we conclude, that team games (21,53%), cycling (12,35%) and swimming (11,81%) are the most popular activities among the students in our research. From the finding of other authors (Bartík – Kubiš 2013, Czaková – Fifiková 2011) we can say, that team games from the long-time perspective belong to the most popular physical activities in physical education and sport as well as in extra-cullicular activities for the pupils of elementary school.

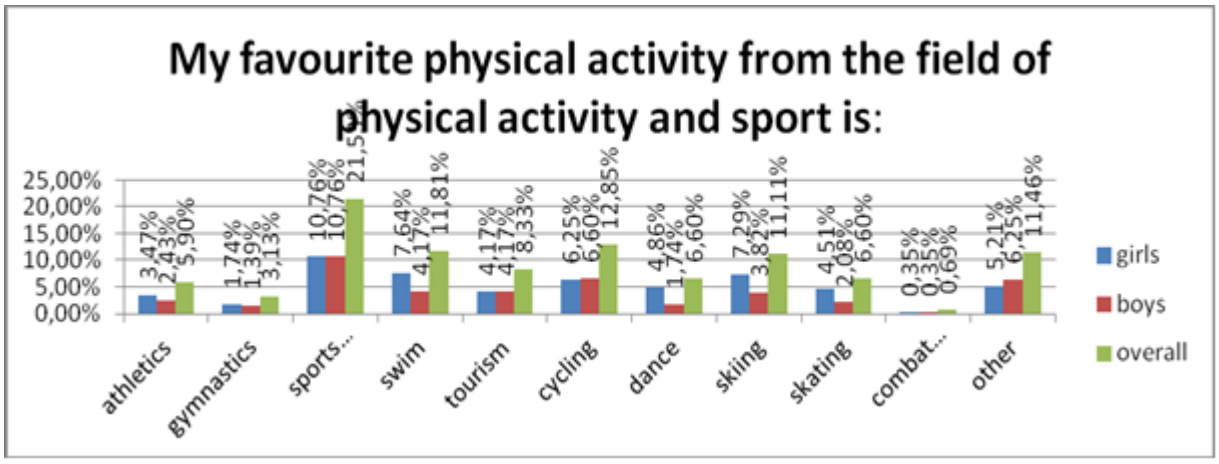

Figure 2 My favourite physical activity from the field of physical activity and sport is

Svačina (2011, In Bebčáková , 2011) notes that the lack of physical activity is a factor that occurs simultaneously with obesity and its consequences, such as: increased blood

pressure, diabetes , atherosclerosis and cancer . According to the author, in terms of obesity, the lack of physical activity is as dangerous as overeating.

From the studies of the World Health Organization on risk factors, it is clear that physical inactivity or sedentary lifestyle belong to the ten leading causes of death and injury. Approximately 60% - 85% of the world population does not have sufficient movement, which is essential for health. Sedentary lifestyle doubles the risk of cardiovascular disease, diabetes, obesity, increases the risk of developing colon cancer, high blood pressure, depression or anxiety (Ištoňová, 2008).

The results in Figure 3 show that even in these days of increasing sedentary lifestyle and increasing informatization of society, boys (23,21 %) and girls (24,11 %) in the second stage of primary schools participate regularly 3 times a week in selected physical activity, which may be considered as a positive relationship towards physical activity.

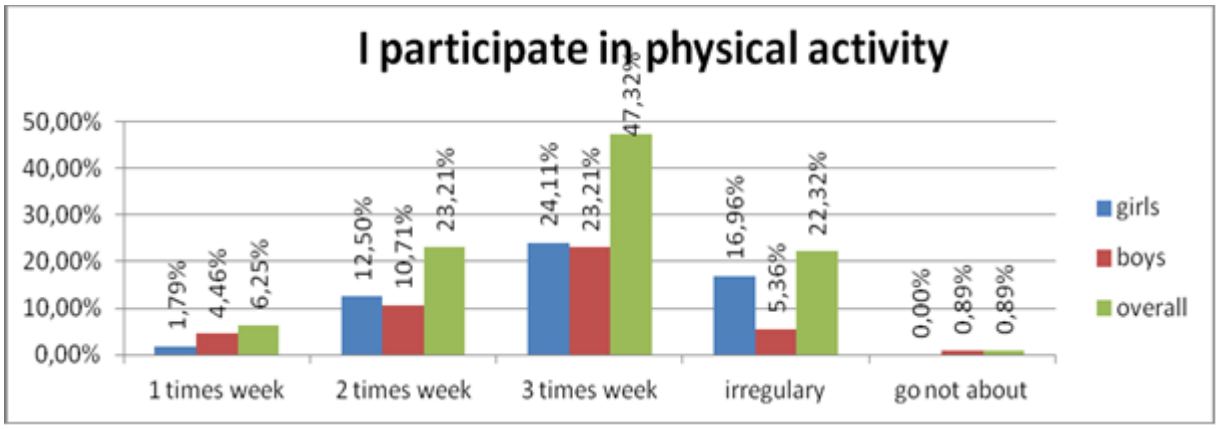

Figure 3 I participate in physical activity

In the next question we examined where the students participate in the physical activity mostly. Boys do sports mostly in sport clubs (12,50 %) as well as on recreational basis with friends (12,50 %), whereas girls do sports mostly on recreational basis with friends (22,30%) a the second most often answer was „something else“(12,50%) (Figure 4).

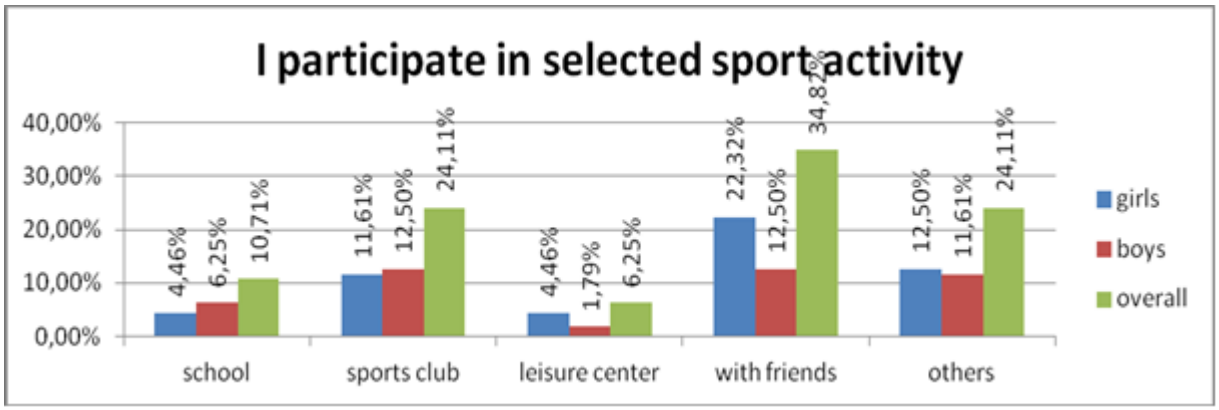

Figure 4 I participate in selected sport activity

School is one of the entities involved in the education of students outside the classroom, and in particular by targeting the young population to the positive use of their leisure time (Liba, Uherová, 2003). In terms of humanization and democratization of education and teaching, it is necessary to create favourable conditions for the possibility of sports, based on the interest and preferences of primary school pupils.

Physical education teachers can motivate pupils to a positive relationship to any physical activity by organizing special physical education within extra-curricular activities based on the findings and knowledge of physical activities preferred by students. The results in Figure 5 say that almost half of the students (49,11 %) do not attend sport activities within extracurricular activities or out of classroom physical education.

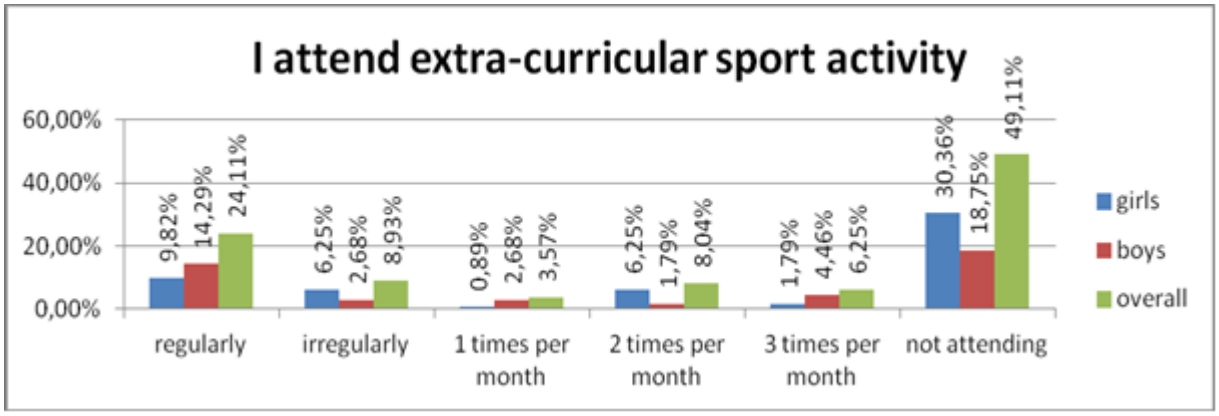

Figure 5 I attend extra-curricular sport activity

The last question we were interested in was to examine the experiences of the pupils with extra-curricular sport activities. Figure 6 shows, that students attending these activities have rather good experiences, which prevails negative experiences. 18,75 % of girls and 16,96% of boys have good experiences with the extra-curricular sport activities.

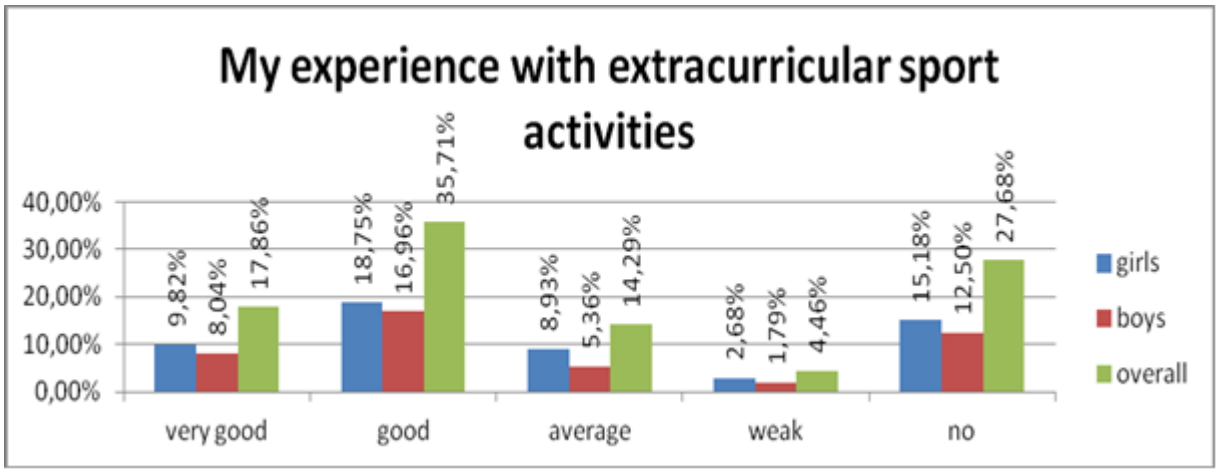

Figure 6 My experience with extracurricular sport activities

CONCLUSION

The aim of this study was to determine the current status in the relationship of elementary school pupils toward physical and sport activities. We assume, that the results of this study will contribute to the improving and targeting the management of physical and sport activities of elementary school pupils at a given stage and point to the possibility of improving the attractiveness of the content. It will create space for the satisfaction of their interest and help teachers, coaches, educators and parents to adapt their leisure time to the interests of pupils.

In the same time we assume, that each current study of the trends and opinions on implementation of physical and sports activities will help us to reveal the current values of the second stage pupils at primary schools.

Our findings clearly confirmed, that the second stage pupils of elementary schools in region of Detva have positive relationship towards team games as well as to physical education and sport. Based on our results we can conclude the most common sport activity the students have participated in are sport games, cycling and of winter sports it is mainly skiing. The respondents have stated, they participate regularly 3 times a week in selected activities. The reasons and motives why the respondents do these selected physical activities are positive relationship to sport, body forming, losing weight, health issues as well as increasing sport performance. .(Bartík – Kubiš 2013).

Most pupils stated, that they do sports especially in friendly surrounding with friends, in sport clubs and during extracurricular sport activities. The most common answer in terms of experiences with extracurricular sport activities was, that they have good or very good experiences.

Our recommendations are to improve the educational process in school physical education as well as in extra-curricular physical education, implement unconventional physical and sports activities, modernizing the curriculum, forms and methods of work. Modernize sport facilities and material equipment of schools. Mobilize cooperation with parents and school sports clubs to improve pupils' attitudes towards school physical education and regular physical activities and sports, and particularly the 2nd stage of primary school. Greater attention must also be paid to the theoretical education of the pupils in Physical Education and Sports.

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VZŤAH ŽIAKOV ZÁKLADNÝCH ŠKOL V REGIÓNE DETVA K POHYBOVÝM A ŠPORTOVÝM AKTIVITÁM A K ICH VYKONÁVANIU

SÚHRN

Autor tohto článku prezentuje vzťah žiakov druhého stupňa základných škôl v regióne Detva k pohybovým a športovým aktivitám ako aj k ich vykonávaniu. Taktiež sa autor v článku venuje otázkam, ktorým aktivitám sa žiaci venujú najčastejšie či už v školskej telesnej a športovej výchove alebo mimoškolskej čiže záujmovej činnosti a tiež frekvenciou ich vykonávania. Použitou výskumnou metódou bol dotazník, použitý na výskumnej vzorke 224 žiakov (100 chlapcov a 124 dievčat) štyroch základných škôl (1 dedinská a 3 mestské školy) v regióne Detva. Na základe zistených výsledkov, ktoré autor prezentuje v použitých grafoch vyplýva pozitívny vzťah žiakov základných škôl k pohybovým a športovým aktivitám. Medzi najviac obľúbenú pohybovú a športovú aktivitu patria športové hry pred cyklistikou a plávaním.

KĽÚČOVÉ SLOVÁ: pohybové a športové aktivity, voľný čas, základná škola.

DIAGNOSTICS AND CORRECTION OF THE FREESTYLE TECHNIQUE OF PHYSICAL EDUCATION STUDENTS

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SUMMARY

The scientific essay is oriented on the swimming style of crawl (freestyle). At the beginning of the survey the authors diagnosed the beginning level of the swimming technique, which the students had at the time of their entering to the 1st grade at the university. After the semester of education of the subject „Swimming 1“ they went through an elective subject aimed on the improvement of the swimming technique. Both subjects contained swimming improvement programme, that completed the traditional content with the system of effective exercises to correct defected techniques. By the output testing we found out the affection of the applied programme to the changes of qualitative indicators of the swimming technique of the students.

KEY WORDS: swimming technique, faults in swimming techniques, diagnostics in swimming technique.

INTRODUCTION

Swimming belongs into motion activities that are popular in a greater part of our population, even the most requested, which confirm surveys of favour of motion activities among various authors (Bartík, 2009; Benčúriková, 2011; Paugschová – Jančoková, 2008; Palovičová, 2003; Śmiglewska et all, 2013). The theory and didactics of swimming belongs into key subjects of teaching plans of universities, which prepare teachers and trainers in the range of education of physical education and trainer´s practice. The programe of swimming education of physical education students is longlasting made-over and verified, but it is not dogmatic and respects necessary changes for improvement of education (Bence - Varnai, 2011).

The main criteria to give credit is to present of a right technique and fit into time limits for 50 metres freestyle and a 100 metres breaststroke. The monitoring of swimming capability of primary and high school students, and / or university students, respectively gives us a feedback of effectiveness of swimming education. In the present time constantly decrease requirements for the applicants of physical education studies and sport, who can continue in entrance exams, gaining no points in swimming, however they swam a 100 metres distance in a chosen swimming technique. The students often enter the compulsory subject „Swimming" with wrong adopted motion habits, that means with wrongly adopted swimming technique. In these cases the reparation of faults is very difficult and not all of the faults are always eliminated. Many surveys of many university teachers show a constantly decreasing level of efficiency and swimming technique of the applicants of studies (Janko, 2005; Macejková - Benčúriková, 2003; Cieślicka et all, 2009). Longlasting monitoring of swimming technique of university students was done by (Mandzák, 2010; Mandzáková, 2012; Popelka, 2010; Tonhauserová – Mandzák, 2010). The assessment of swimming technique in point of quality and effectiveness of the execution of stroke movements and swimming efficiency gives us a feedback of education effectiveness. By revealing the most often faults in technique commited by the students we can better understand causes of an improper adoptation and during the education apply proper exercises for correction of defects found.

AIM

The aim of our survey is to diagnose defects in freestyle swimming techique of 1st. year students of the field physical education trainers in the school year 2011/2012 and compare their qualitative changes after applying of corrective swimming programe during the classes of the compulsory subject „Swimming 1" and the ellective subject „ Swimming exercises" at the department of Physical education and Sport, Matej Bel Univeristy in Banská Bystrica during two semesters.

METHODOLOGY

The main condition of arranging into our file was to complete the subject „Swimming 1" in the winter and summer semester and „Swimming exercises" in their full range. The survey file composed of male students of the 1st year at the department of Physical education and Sport, Faculty of Humanities, Matej Bel Univeristy in Banská Bystrica, field of study Physical education trainers in the total amount of 78. The average age of the students during the survey was 20 years. The file consisted of active and former sportsmen of individual and

team sports. The students disposed only their swimming abilities gained by individual non-organized swimming in time before entering the university studies, or the former studies at primary and secondary schools during organized swimming trainings. According to the limited amount of students in one grade, the survey lasted in two academic years. We began the survey at the beginning of the winter semester in October 2011 by input monitoring of qualitative angle of the freestyle technique and efficiency testing of arms, legs strokes and their interactive combination. We executed this testing in 25 metre long swimming pool with 6 lanes at the department of Physical education and Sport, Faculty of Humaities, Matej Bel Univeristy in Banská Bystrica. The average water temperature culminated at above 28 ºC during the tests. The input and output diagnostics of the freestyle technique consists of technique monitoring according to the evaluation scale Svozil – Gajda (1997) and testing of efficiency of arms, legs strokes and their interactive combination acording to our adopted testing battery. We executed the input testing during the first contact class of the subject „Swimming 1“ and the output testing during the last class of the subject „Swimming exercices“ in May 2012. To eliminate the other factors, that could influence the results of our survey the students were asked to continue not in their individual improvement of their freestyle swimming technique during their free time. During the swimming education in the range of 26 classes the students adopted the freestyle and the breaststroke swimming styles. In both semesters they attended two hours of swimming per week. We neither use the methods for increasing the speed, nor the strength in the content. The content was purely aimed on the technical aspect of crawl movement of arms, legs, breathing and their interactive combination.

RESULTS

Table 1 captures the percentual concern of technically unsufficient executed partial movements, which represent the nodal points in the structure of swimming style crawl. The most common faults found (expressed in %) are shown in bold in the chart.

By the input assessment of the technique level we found out, that the biggest defect in the male students file occured similarly in breathing. As our survey files consisted of the newcomers of the 1st grade, this high percentage shows that in their previous period of the swimming preparation was unsufficiently aimed to one of the most important basic swimming abilities, which is correct breathing. Keeping the head above the water, frontal inhale or unsufficient duck of the head indicate the basic defect of the pre-swimming preparation in the phase of adaptation to the water environment.

Table 1 The most common faults of the input assessment of the level of the freestyle technique of male students in the year 2011/2012.

Selective characteristics		Execution	Male students	
			Input %	**Output %**
1	**Arms transmision above the water**	**Bent arms in elbows, relaxed arms**	**39,74**	**24,35**
2	**Enter of the arm into the water**	**The arm almost straight, first enter the fingers in the position before the arm**	**41,02**	25,64
3	**Underwater arm stroke (adduction)**	**Stroke with high elbow position (the elbow does not work as the first)**	8,9	8,9
4	**Underwater arm stroke (push away)**	**The arms bent in the elbow (90° in the half of the stroke) a straight stroke ended near thigh**	**32,05**	**19,23**
5	**Leg work (thigh)**	**Changing movement starting from the hips**	**23,07**	12,82
6	**Leg work (knees)**	**Downward movement, the knee slightly bent**	8,9	3,84
7	**Leg work (ankle)**	**Straight ankle, big toes facing each other closely under the water surface**	12,82	3,84
8	**Breathing**	**Regular exhale, inhale by turning to the side without lifting**	**55,12**	19,23
9	**Interaction**	**Regular without interruption, in time sequence**	16,6	0
10	**Body position**	**Almost horizontal (cca 10 grades)**	**21,79**	10,23

We noted high ratio of occurance of wrongly adopted arm movement. Similar to the breathing defect we verified analogic status. In 3 out of 4 chosen characteristics of the arm movement is the occurance of the faults percentually comparable. We can explain this status as a result of teaching freestyle swimming at the primary schools traditionally after the breaststroke, as the second swimming style. This broadly decreases the possibility for its more impeccable managing. If in the short period of time after the swimming practise does not keep on its further improvement, it is sure, that these faults will fixate deeper. Elimination of these defects in a higher age is more difficult. In demands higher time donation, physical preparation and patience to achieve the willing efect.

The moment of the arm movement entering the water, that means in the phase of duck and preparation for a new stroke influences the slide of the swimmer in the water and to a particular ratio the length of the stroke, as well. In our file we noticed increasing occurance of crossing the longitudinal axis of the swimmer´s body by the stroking arm. It is a fault

connected with a low level of arm joint movement and a low position in the elbow by its entering the water. Crossing the axis increases the frontal resistance and the waving of the body in the horizontal position, but we must note that this fault did not negatively influence the stroke under the water.

The range of the stroke shortened according to our expectance not only in the praparation phase, but in its second part, in so called pushing away. 32.05% of the male students finish their stroke very early around the pelvis. This technique in the water looks like „raking“. Swimming with shortened length of the stroke increases the number of executed strokes by reaching the same time as by the swimmer, who makes less strokes at the same distance. The negative indicator is the increased energetic output at the expanse of swimming distance and reached time.

The most common fault in the transmision phase, that we noticed was the transmision by the lateral curve (39,74%). As stated by Jursík (1990), it creates an enormous torque, because the straight distance of the hand from the arm joint, with almost eccentric arm (lever mechanism) is very long. The input testing did not show any meaningful defects in the leg movement. The coherence of particular faults in breathing and the arm movements mentioned above, puts over to the correct body holding during swimming. It is 21,79% by the male students.

Horizontal swimming position of the body closely interrelates with the shape, weight and density of the body, which according to us is the main indicator among the boys and girls. Generally speaking of the boys we can tell that, during the swimming more markedly begins turbulent spinning of the water around the body, which imminently interrelates with their position in the water. Furthermore, our file consisted of active sportsmen doing various individual and team sports, which in this age effects specifically their anatomical and physiological body structure. This influences up to particular ratio positively or negatively their motion expose and by this influences the qualitative way of te swimming movements in the water.

The output testing demonstrates the positive changes at the level of adopted and improved freestyle technique. In spite of lurking defects in the particular assessed characteristics we can verify their lesser frequency of occurance.

The biggest improvement were noticed in the range of breathing. In the file of male students occured the breathing technique improvement at the level of 36%. The exercises used for correction of excessive head turning with back-bend were approved by us. The head back-bend during the inhale, which caused its lifting above the water was almost eliminated by the

influence of swimming exercises. The defects in the range of turning the head to both sides persisted. The faults of this character is relatively difficult to eliminate, because the wrong adoption was stabilizing in the long term and in the interaction with arms it needs a higher frequency of corrective hours for its elimination.

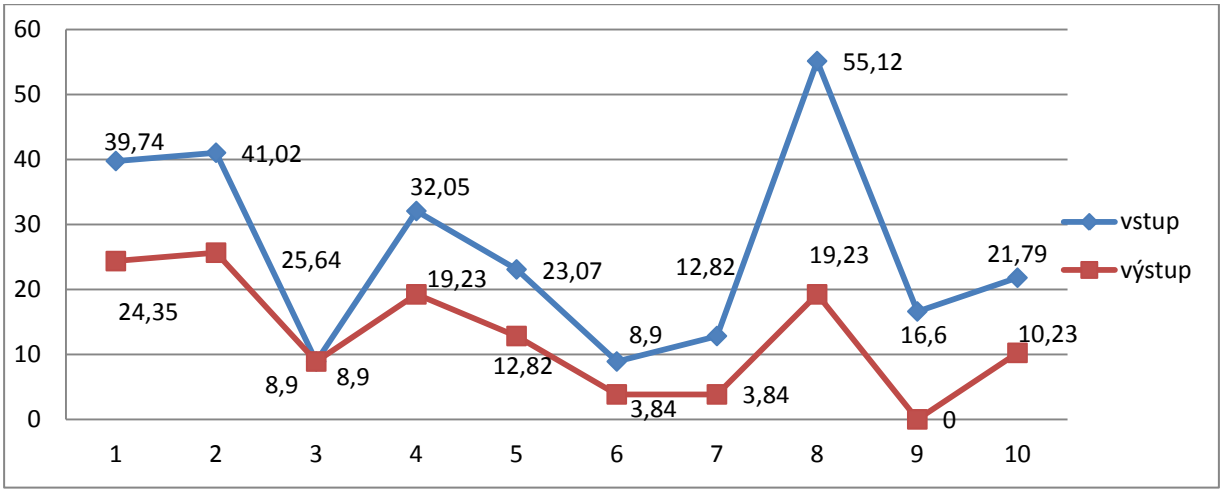

Figure 1 Comparison of input and output assessment of the level of adopted swimming style crawl by male students.

Legend: axis x – chosen characteristics of techniques assessment (table.1), axis y: %

By the comparison of the assessed techniques we found out a correction of wrongly adopted swimming movements in the phases of transmision and entering of the arms into the water (Figure 1). The most expressive change of the technique under the water was noticed in the push-away phase. We can admit the decrease of the occurance of wrongly ending of the stroke phase by the male students, but not at so massive level. It can be explained by the natural male handicap of flexibility and joint movements of the arms and also according to their focus of sports activities. The swimming strokes were executed by higher frequency and strength. It resulted in the early finishing of the stroke in the water and pulling the arm out of the water somewhere around the hips (pelvis). This defect results as a lower affection of swimmer´s flow. We found out the adequate improvement in wrongly adopted position of the body during swimming in the file of the male students. The improvement was 11,6%.

CONCLUSION

By the input testing we found out the most excessive defects in the technique and the rhythm of breathing. The problem of breathing is with this particular style a standard matter, which we verified in our previous publications Mandzák (2010) and Tonhauserová – Mandzák (2010).

The disability to include breathing into particular cycles of the arms movements is not influenced by the insufficient practice of the arms and breathing coordination. The problem is, that the students did not adopt sufficiently the abilities such as diving into the water and keeping themselves in the correct flowing position. Except this, it is impossible to complete successfully the breathing practice and its following interaction with other movements. These abilities should be adopted during the swimming practise courses at the 1st and 2nd grade of education.

In the phase of the beginning and ending of the stroke we verified some defects. By the male students dominated the defect in the phase of the arm transmision and keeping the optimal body position during swimming. We can verifiy the improvement of the adopted technique according to the results that were made at the end. Despite the defects, that still persisted among the students we gained percentually decrease of the faults. The improvement programme and its systematic application brought the meaningful improvement of breathing. The head back-bend persisted even longer by the majority of the students, despite we focused a great range of hours for its elimination. The programme applied during two semesters verified its influence, which was noticed in the percentual decrease of technical faults in the swimming style.

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DIAGNOSTIKA A KOREKCIA TECHNIKY PLAVECKÉHO SPÔSOBU KRAUL U ŠTUDENTOV TELESNEJ VÝCHOVY

SÚHRN

Vedecká štúdia je orientovaná na plavecký spôsob kraul. Na začiatku výskumu autori diagnostikovali počiatočnú úroveň plaveckej techniky, ktorú mali študenti v čase nástupu do prvého ročníka na vysokú školu. Po semestrálnej výučbe v rámci predmetu „plávanie 1“ študenti absolvovali výberový predmet zameraný na zdokonalenie plaveckých techník. Oba predmety obsahovali korekčný plavecký program, ktorý dopĺňal tradičný obsah o systém účinných cvičení na korekciu chybných techník. Výstupným hodnotením sme zisťovali účinnosť aplikovaného programu na zmeny v kvalitatívnych ukazovateľoch plaveckej techniky kraul. Výsledky potvrdili percentuálny pokles technických nedostatkov v plaveckej technike študentov.

KĽÚČOVÉ SLOVÁ: plavecká technika, chyby v plaveckej technike, diagnostika plaveckej techniky.

SNOWBOARDING AT SCHOOL

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SUMMARY

The aim of the paper is to introduce sport industry with focus on snowboarding, its teaching methods mainly the teaching level in school area and the knowledge level of teacher as an instructors of school snowboarding. Subject of our research is to find out the interest of snowboarding in the chosen area.

KEY WORDS: snowboarding, state educational program, students.

INTRODUCTION

Snowboarding is one of the most progressively developing winter sports in the recent years. This sport has become phenomena, therefore has to be respected by each of us who carrying out any winter sport. Over time it has gain his place and it cannot be seen as a fashion accessory or youth fun as it was in its beginnings. Snowboarding is liked by all ages thanks to its easy acquirement, driving pleasure and magic.

To obtain all those aspects, it is necessary to realize, that it will be much easier to learn it if we use services of quality snowboard instructors who know the exact teaching methods and obtain safety principles during training. If we entrusted to the hands of a professional we can prevent unnecessary injuries and possible further lack of interest in snowboarding. We are all aware that a bad instructor equals uninteresting training.

Snowboarding passed by a rich development. Beginnings date back to the sixties of 20. century. The roots of the sports are in United States. The tendency to make something similar to a snowboard had primarily suffers. They need alternative of their sport, which enable them winter training while diversifying their sport activities (Binter, 2006).

The first administrative step in accordance with applicable legislation (§ 7 1 of the Decree on primary schools) is the inclusion of ski course or snowboard course into a work plan of the school. Before director make this inclusion it is necessary to clarity if the

organization has enough employees who are able to fulfill the qualification criteria for position as ski instructor, respectively snowboard instructor. Snowboarding, as a part of the physical education and the sport education within the ski course, has positive impact on fitness, muscle strengthening and on conditioning development of young people. Snowboarding meet the same objective as the physical education and sport education, while it tries to act on harmoniously development of individuals who have to respond quickly and correctly, and thus they are involved in process as mentally as physically. And here just happens parallel linking of the snowboard objectives and the physical education and sport education (Michal, 2001).

When creating an observation of motor activity we find among out athletes first generalization, which is a manifestation of irradiation of excitation and inhibition. In the second and third phases of creating exercise habits on the basis of concentration and stabilization processes of excitation inhibition differentiates and automates the movement activities and creation the basis of long-standing practice among athletes the creative association crates coordination of their motor activity (Michal, 2009).

AIM

The aim of the research is to determine the extent of snowboarding on the elementary and secondary schools in Slovakia and to determine the extent if the teaching is professionally and materially secured.

METHODOLOGY

Questionnaires were distributed by e-mails to the e-mail addresses of chosen schools. Due to the some incorrect e-mail addresses we were not able distribute questionnaires to all schools. From a quite large number of send questionnaires only 35 returned. From 35 questionnaires 17 were from secondary schools and 18 were from elementary schools. Our research was focused on various schools from several regions, concretely 4 elementary and 4 secondary schools in Snina, 4 elementary and 4 secondary schools in Žilina, 4 elementary and 4 secondary schools in Košice, 1 secondary school in Prievidza, 1 elementary school in Fiľakovo, 4 elementary and 4 secondary schools. Sociological method of interview was the main method, by which were obtained empirical data necessary for our research. Questionnaire contains 15 questions. We used open and closed questions.

RESULTS

The first part was focused on the question, if the schools organized courses aimed specifically at snowboarding (Figure 1). The results showed that 10,2 % of respondents answered positively and organize courses aimed directly on snowboarding. 36,5 % respondents answered negatively, which means they do not organize snowboarding courses and use the basic model of courses as a skiing. Whether the student can chose equipment for course answered positively 52,3 % of respondents. During the courses must be presented as instructor of skiing as snowboard instructor. Each has its own group. We do not share the same idea that student on winter skiing course can take as skiing as well as snowboarding equipment. It is due to the fact that each course (skiing/snowboarding) need enough time for methodology.

Similar studies made Beták - Fabianová (2013), who found different results. In their research answered only 20% of students that they can choose equipment for course.

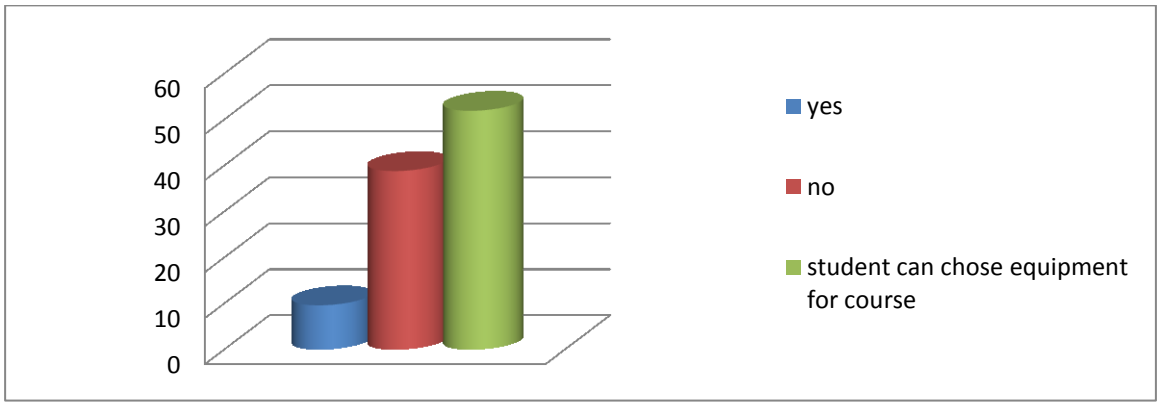

Figure 1 Have you organized winter skiing courses aimed on snowboarding

Second part is focusing on staffs who teach on the winter courses aimed on snowboarding (Figure 2). Respondents answered that 15,2 % of them has at least on school teacher with license of school snowboarding. 5,4 % respondents said that they have at least 2 instructors. The answer none responded 26,0 % and 51,1 % said that they use services of external instructors. From our point of view those results are not satisfying due to the expansion of this kind of sport.

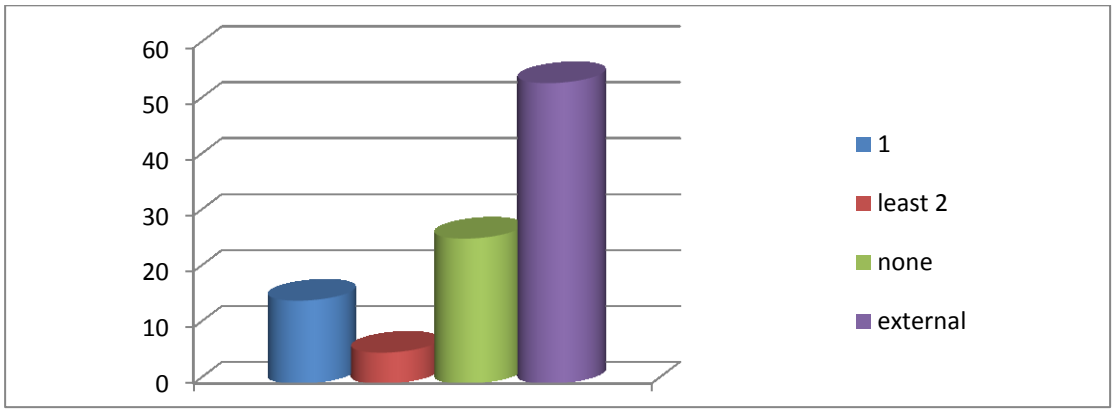

Figure 2 Is someone from teachers the snowboard instructor with valid license

In other parts of questionnaire we evaluated the responses to the question whether snowboarding is included in teaching process (Figure 3). 35,2 % respondents answer that because of the high interest of student and 24,8 % because of parents' interest. High student interest in snowboarding also found Beťák (2012).

We consider it very necessary and important to react on their needs. And thanks to that is the teaching process more interesting for students. Surly even the teachers welcome the news in teaching process. 25,2 % of respondents have not placed snowboarding in to the teaching process at all. Thanks to the teachers initiative 7,9 % respondents placed snowboarding in to the teaching process. This result is quite small. We think that it is due to the current not pleasant situation in finding working places and young students have problem to find a job due to the higher age of actual teachers who cannot or do not want to leave on retirement. 7.5 % respondent placed snowboarding in to the teaching process thanks to the licensed teachers and therefore they do not have reason for not place the snowboarding in to the teaching process.

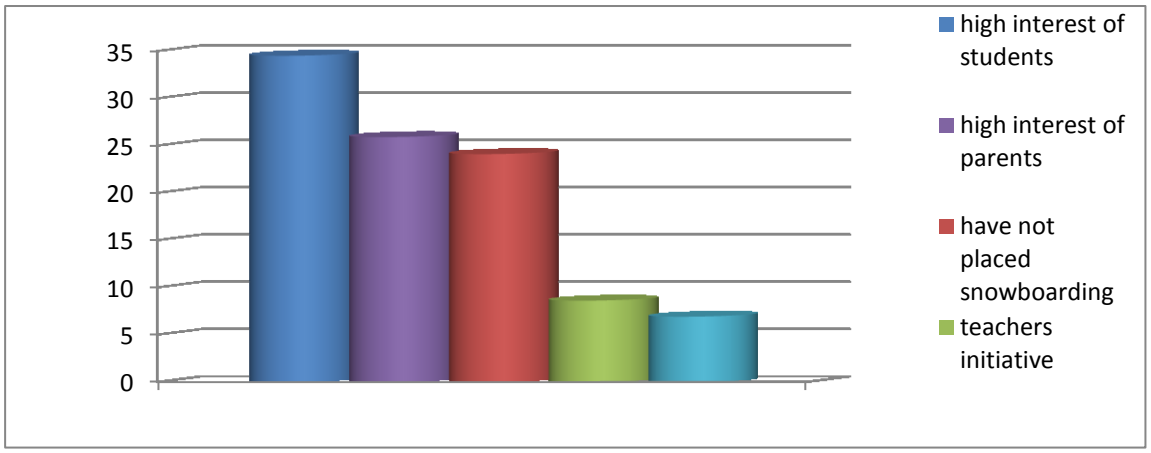

Figure 3 What was the reason to place the snowboarding in to the teaching process?

The other part that we evaluate is whether students and teachers can rent snowboard equipment at school (Figure 4). None of the asked school has this kind of possibility for students. It is close link with the number of students at school, with financial situation, whether grants are used or whether sponsorship is available. The big role also plays fact that snowboarding in teaching process is new and therefore schools do not think about this possibility to rent equipment. And that is the reason why only 5,9 % of respondents think about buying the snowboard equipment. Whether is possible to by this material depends on many aspects and possibilities of each school.

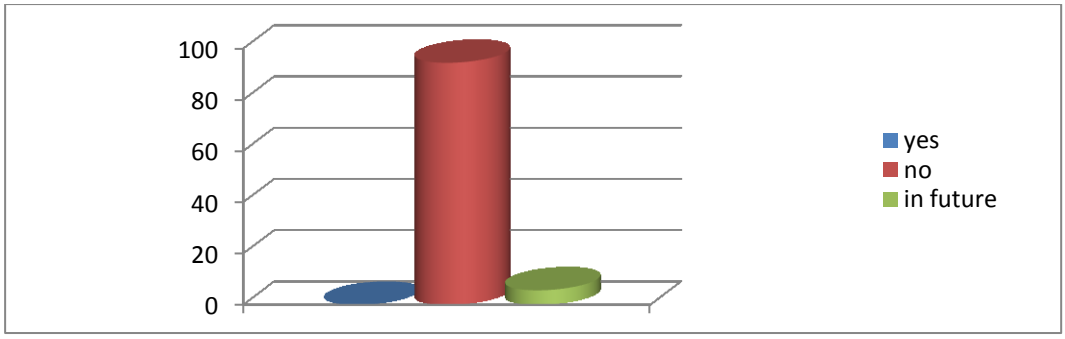

Figure 4 It is possible to rent snowboard equipment in your school?

Also we tried to find out whether snowboard teachers use additional teaching equipment in teaching process (Figure 5). 8,1 % use DVD, where student can clearly and precisely see the basic of snowboarding and methodology steps. It is small percentage and we think that the reason is that is lack of snowboarding DVD on the market and therefore it is proper to use videos on the Internet. 50,2 % of negative response is quite a lot. We think that the teachers should use more additional teaching equipment in teaching process. 6,1 % are school that use in methodology sticks and cones. We have to admit, that thanks to our participation on courses they used those additional equipment. 32,5 % of respondents use methodology scripts. It is logical because each license instructor should know these scripts or at least use them during the teaching process.

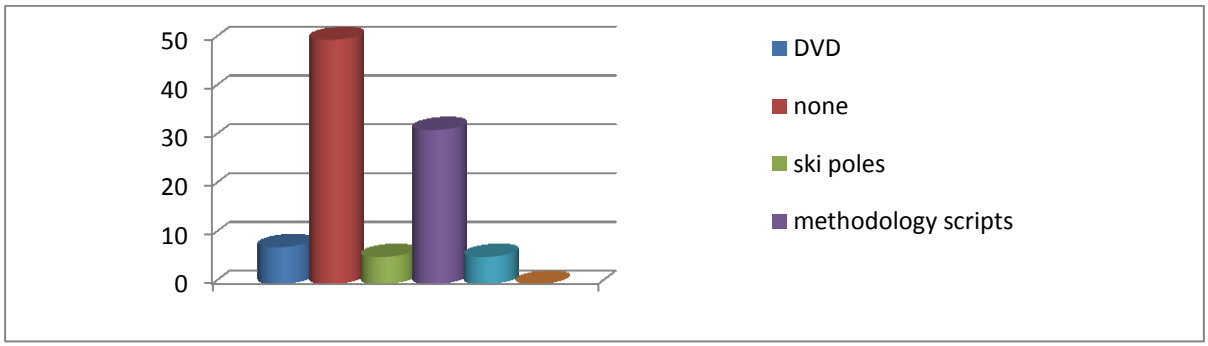

Figure 5 What kind of teaching materials do you use during snowboard teaching?

The aim of the research was to determine what percentage of student after snowboard course, continue in this kind of sport (Figure 6). 21,2% think that only 9,8 % student continue with snowboarding. 13,2 % think that after snowboard course 30 % student remain loyal to snowboarding. 26,1 % respondents answered that half of the student of winter course snowboards active. Up to 34,2 % respondents could not dedicate the percentage how many student after winter course like snowboarding. 26,2 % respondents said that 50 % students after winter course snowboards. The largest percentage (90 %) student who snowboards said that 7,8 %.

We consider this evaluation as satisfied, since none of the respondent answer 0 % that means that student like this kind of sport and want to do it. For us it means that we should continue in developing of snowboard teaching.

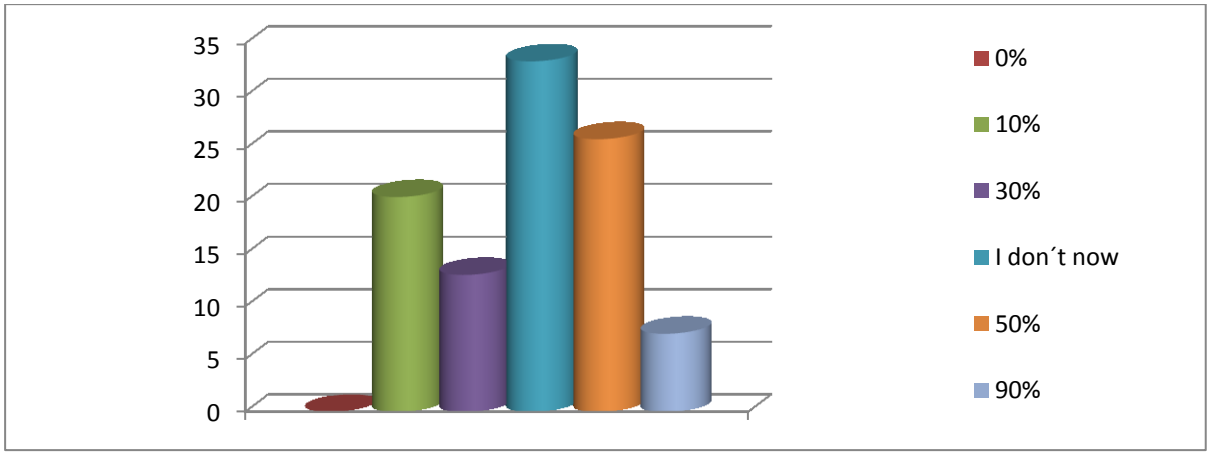

Figure 6 How many students at your school continue with snowboarding after winter course and snowboard?

CONCLUSION

For the last few years is characteristic that the importance of winter courses in recent years deducted. Whether it is because of financial difficulties or organizations or total lack of interest of students in any sports. It is necessary to emphasized that the original fashion hit, snowboarding, view of youth on winter sports has changed.

For our research it was important to determine the extent snowboarding teaching at the elementary and secondary schools, whether they organize winter courses. From the obtained results suggests that not all the respondents placed those course in to their teaching process

despite the fact that the interest of students is so large. The reasons are different, whether lack of funding or few qualified teachers or other problems that do not allow them to organize snowboards courses. On the other hand, the schools that organize those courses do not organize them individually. They join them with ski courses and student can chose what kind of winter sports they want to do. During the winter course students learn not only methodology but also technique principles of snowboarding and also they learn to respect the safety standards and rules of stay in mountain and ski slopes. What goes hand in hand with certain standards of social behavior, but the results show that this is not a rule on each winter course in Slovakia. The question whether place snowboarding as a mandatory or optional is complicated and each of us can have different point of view. We are inclined to the opinion, that those courses should be mandatory due to the growing interest in this kind of winter sport. According to the responses, there is still lack of staff that will be able to teach snowboarding at schools. We think that at each school should be at least two teachers who are snowboard instructors and are able to cover basic teaching. Also, from the financial point of view, it is better for school to have teachers rather to pay external instructors with license.

When the instructor is well prepared, is able to get students attentions for sports in grater extend. Whether it is didactic part or technical issues how to take care of equipment, instructional films, newspaper and so on. Very popular instrument for teaching snowboarding is to record snowboarding on video-camera.

According to the research we found out that nowadays, number of snowboard instructors is not adequate. But we have to highlight that the expansion of this kind of sport is so high. Teachers and the principals of the school try to deal with this problematic and solve it.

From our research we can see that in our country snowboarding is not teach in wide range at elementary and seconds schools. We think that snowboarding should be taught in winter courses and should become part of the teaching program of each elementary and secondary school. It is necessary to accept the fact that snowboarding is a strong sport and the number of snowboarder has risen each year.

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SNOWBOARDING NA ŠKOLÁCH

SÚHRN

Cieľom výskumu je zoznámiť verejnosť so športovým odvetvím - snowboardingom, jeho metódami výučby a predovšetkým úrovňou výučby v školskej sfére a úrovňou učiteľov ako inštruktorov školského snowboardingu. Predmetom nášho výskumu v tejto práci je zistiť v akej miere je snowboarding rozšírený v skúmanej oblasti.

KĽÚČOVÉ SLOVÁ: snowboarding, štátny vzdelávací program, žiaci.

SOMATIC CHARACTERISTICS AND MOTOR SKILLS OF GIRLS FROM JUNIOR HIGH SCHOOLS IN BYDGOSZCZ AGAINST THEIR PEERS INVOLVED IN THE NATIONWIDE STUDY

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SUMMARY

The purpose of this article is to demonstrate differences in somatic build and motor skills, measured on the basis of the International Physical Fitness Test (IPFT), of junior high school girls from Bydgoszcz in comparison with their peers from other Polish towns and cities considering chronological age. Measurements were conducted in spring (April and May) 2012 among 567 girls (178 girls aged 14, 180 girls aged 15 and 209 girls aged 16). Mean values and standard deviations were calculated. The statistical significance of the differences between the compared groups was established using student's t-test and amounted to 5% and 1%. The study findings were demonstrated in charts and graphs (including descriptions). Regular and extramural students of physical education from Kazimierz Wielki University in Bydgoszcz contributed to carry out the research issue.

KEY WORDS: junior high school girls, somatics, motor skills.

INTRODUCTION

The purpose of this article is to demonstrate differences in motor skills of girls from junior high schools in Bydgoszcz in comparison with their peers from other Polish towns and cities considering chronological age. Changes in morphological development, after a while, are a process which consists of increasing in body size. It is the effect of ontogenetic processes such as differentiation and adolescence (Cieslik, 1994). These processes may vary for boys and girls, which is known as dimorphism characterized by morphological,

physiological and mental differentiation of men and women. Biological development of a human being takes place in concrete environmental, social and biological conditions. Development disproportions may be especially observed during progressive development proceeding the period of adolescence. Therefore, it seems obvious that the level and the "quality" of life of different social groups significantly influence the effects of this development and thus determine human development differences in somatic characteristics and motor skills. Changes of civilization habits, apart from the positive effects, also contribute to the occurrence of factors adversely affecting especially the body of children and youth (e.g. limited physical activity, exercise, bad eating habits, the lure of various forms of communication including TV, etc.). Hence, an increasing role of health education and endeavours aimed at improving physical fitness of children and youth. These endeavours need to become a permanent process involving all levels of education process (Napierala, 2005, p. 7). As the child develops, there appear in his or her life acquired motor skills and the level of motor abilities is higher. Human motor abilities, characteristic for individual ontogenesis phases and expressed in motor actions and activities, account for physical fitness. Thus defined physical fitness is the state of body which determines motor resourcefulness in situations which a child (as well as an adult) may encounter in the surrounding world. ,,Physical fitness is therefore evidence of the degree of maturity and efficiency which can be tested first of all during physical exercises" (Przeweda, 1973, p. 179).

Physical fitness has been a subject of observation for long, therefore, people who are strong, fast, skilful, tireless, dexterous and resourceful as far as motor activities are concerned irrespective of their body build, regularity of development and the potential of their developmental possibilities, are considered to be physically dexterous in practice of physical education and sport (still to this day) (Gilewicz, 1964).

Within the tasks of methodology of physical education established to consciously control somatic development of a human, the concept of physical fitness has to be approached from a much broader perspective than in case of sport. In sport, only the degree of preparation for concrete physical exercises has been accepted as a physical fitness test whereas a teacher, apart from that, needs to be also interested in health condition, body build, regularity of development rhythm and the potential of developmental possibilities. An effect of a physical exercise is not of vital importance to a human being and appeals to him or her only when it is combined with the type of body build, age and general development indexes. When assessing development of youth according to the level of effort available to them, one should realize

that the same result achieved in running, jumping and throwing by individuals of different height and weight, does not determine their substantial physical effort (Gilewicz, 1964).

AIM

The purpose of this article is to demonstrate differences in somatic build and motor skills, measured on the basis of the International Physical Fitness Test (IPFT), of junior high school girls from Bydgoszcz in comparison with their peers from other Polish towns and cities considering chronological age.

HYPOTHESIS

1. Girls from Bydgoszcz secondary schools are characterised by a greater height and weight from their equal age girls of nationwide research.

2. In the measured overall health measured MTSF Bydgoszcz girls from secondary schools achieve better results than observed in the tests nationwide.

Justification:

The results of the tests shall include the total results nationwide girls from the cities and villages, and averaged values are reduced in most attempts by rural environment.

METHODOLOGY

Measurements were conducted in spring (in April and May) 2012 among girls from junior high schools in Bydgoszcz (178 girls aged 14, 180 girls aged 15 and 209 girls aged 16). Mean values and standard deviations were calculated. The statistical significance of the differences between the compared groups was established using student's t-test and amounted to 5% and 1%. The study findings were demonstrated in charts and graphs (including descriptions). Measurements of height and weight were conducted by means of a medical scale and an anthropometer. The measurements of body weight and height were conducted using physician's scales with an anthropometre. The obtained somatic values of female subjects were compared using student's t-test and the statistical significance in the tested subpopulation was assessed at the 5% and 1% level across groups. Statistical significance amounted to 5% and 1%. The study findings were demonstrated in charts and graphs (including descriptions). Students of physical education from Kazimierz Wielki University in Bydgoszcz contributed to carry out the research issue. On the basis of somatic features there

was calculated $BMI = \frac{weight\ (kg)}{height(m)^2}$ and assessments of the values contained in Table 1 were adopted.

Table 1 BMI rating (Woynarowska, 2008)

Age	Girls			
	Underweight	**Proper weight**	**Overweight**	**Obesity**
14	<15.7	15.8-22.9	>23	>25.6
15	<16.3	16.4-23.3	>23.4	>25.8
16	<16.8	16.9-23.5	>23.6	>25.9

In addition, slenderness was assessed according to the Rohrer's index based on the Curtius Key and the Kretschmer characteristics: x – 1,27 the leptosomatic type, 1,27 – 1,49 the athletic type and 1,50 – x the picnic type $I = \frac{body\ mass\ in\ grams \times 100}{(body\ height\ in\ cm)^3}$ (Drozdowski, 1998). The International Physical Fitness Test (IPFT) was used to measure motor skills. This test includes a comprehensive assessment of muscle groups of entire body. Technical elements are not focused on any of main sports. Before testing, the subjects performed a warm-up the same as for an intense physical exercise. A sports outfit during the test should consist of a T-shirt and shorts (alternatively a light tracksuit) and trainers without any lifts or spikes and with non-skid soles. The hang, pull-up and bend tests are performed barefoot. The tests were conducted in accordance with the IPFT guidelines. The International Physical Fitness Test consists of the following eight tests:

1. 50 m run test.
2. Standing long jump test.
3. Handgrip strength test.
4. Measurement of relative strength: bent arm hang test.
5. Shuttle run with carrying blocks - 4 x 10m.
6. Standing forward bend test.
7. 30s sit and reach test.
8. Longer distance run: at a distance of 800 m.

Results of motor skills were statistically analyzed and converted into points according to the T scale. The relevance of statistical differences was determined by means of student's t-test for independent groups. The critical values were as follows: * $p < 0,05$; ** $p < 0,01$; $t_{\alpha = 0,05;\ df = \infty} = 1,96$; $t_{\alpha = 0,01;\ df = \infty} = 2,58$.

RESULTS

As far as the group of 14 and 15-year-old girls is concerned, junior high school girls from Bydgoszcz turned out to be shorter than their peers involved in the nationwide test (0,64cm and 0,11cm), but in the case of 16-year-olds, girls from Bydgoszcz accounted for a bigger group with body height values larger by 2,84cm than their peers from other Polish towns and cities. The differences within this age group are statistically significant at the 1% level (Table 1).

Table 2 Height of girls (cm)

Age	Sex	N	$\bar{x}$	Min.	Max.	S	d	U
14	**Bydgoszcz**	178	162.5	132	185	7.39	0.53	0.92
	Polish towns and cities	1685	**163.03**	143	183.8	6.1		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	164.44	147	192	7.45	0.11	0.19
	Polish towns and cities	1209	**164.55**	145	183	5.81		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	**168.18**	149	190	5.74	2.84	6.55**
	Polish towns and cities	1080	165.34	149	182.2	5.75		

The body weight of 14-year-old girls from Bydgoszcz was higher than their peers' by 3,53cm which was statistically significant at the 1% level. As regards the remaining age groups, students of nationwide study are distinguished by bigger body weight (0,14kg and 0,26kg respectively). These differences are not statistically significant (Table 3).

Additionally, slenderness of girls' bodies was assessed based on the Curtius Key and the Kretschmer characteristics: x – 1,27 the leptosomatic type, 1,27 – 1,49 the athletic type and 1,50 – x the picnic type. Girls in all age groups represented mostly the leptosomatic type (more than 65% among 14-year olds, ca. 68% - 15-year-olds, above 80% - 16-year-olds). Numerous groups of the athletic type can be found among 14-year-old girls (about 31% and among 15-year-olds – ca. 29%) see Table 4.

Table 3 Body mass of girls (kg)

Age	Sex	N	$\bar{x}$	Min.	Max.	S	d	u
14	**Bydgoszcz**	178	**53.64**	35	83.7	8.71	3.53	5.15**
	Polish towns and cities	1722	50.11	24.2	84.5	8.61		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	55.13	40	79.2	7.3	0.08	0.14
	Polish towns and cities	1209	**55.21**	32.87	87.5	7.86		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	**56.32**	41	75	7.15	0.26	0.48
	Polish towns and cities	1080	56.06	35	85.8	7.14		

Table 4 Slenderness of girls' bodies

Type of body	**14-year-old girls**	
	N	**%**
Leptosomatic	116	65.17
Athletic	55	30.90
Picnic	7	3.37
	15-year-old girls	
Leptosomatic	122	67.78
Athletic	52	28.89
Picnic	6	3.33
	16-year-old girls	
Leptosomatic	168	80.38
Athletic	30	14.35
Picnic	11	5.26

Source: own compilation

BMI values were calculated including the age of girls involved in the study. Most students across all age groups had normal body weight (circa 88%, 89% and more than 83% respectively; the number if overweight girls is decreasing (circa 9%, 8% and 4% respectively). On the other hand, the number of underweight girls is growing (1%, 2% and 7%). Detailed data can be found in Table 5.

Table 5 BMI values of girls aged 14 – 16

Assessment	**Development standards**	**Girls**	
14 lat		**N**	**%**
Underweight	<15.7	2	1.12
Normal weight	15.8-22.9	156	87.64
Overweight	>23	16	8.99
Obesity	>25.6	4	2.25

15-year-olds	Development standards	Girls	
		N	%
Underweight	<16.3	4	2.22
Normal weight	16.4-23.3	160	88.89
Overweight	>23.4	14	7.78
Obesity	>25.8	2	1.11
16-year-olds	**Development standards**	**Girls**	
		N	**%**
Underweight	<16.8	12	5.74
Normal weight	16.9-23.5	174	83.25
Overweight	>23.6	15	7.18
Obesity	>25.9	8	3.83

Source: own compilation

Motor Skills: The measurements of explosive strength of legs were taken by means of the standing long jump test. Girls from subsequent age groups from Bydgoszcz achieved still better results, but the group of 14 and 15-year-old students included in the nationwide study dominated the girls from Bydgoszcz with the differences amounting to 10,78% (statistically significant at the 1% level) and 1,46% respectively. In the group of 16-year-olds the girls from Bydgoszcz were characterized by stronger legs by 1,25% (Table 6).

Table 6 Standing long jump of girls (cm)

Age	Sex	N	$\bar{x}$	Min.	Max.	S	d	U
14	**Bydgoszcz**	178	153.93	100	244	25.98	10.78	5.34**
	Polish towns and cities	1668	**164.71**	90	223	21.57		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**U**
15	**Bydgoszcz**	180	166.71	110	245	23.94	1.46	0.77
	Polish towns and cities	1188	**168.17**	96	230	21.16		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**U**
16	**Bydgoszcz**	209	**171.57**	108	240	25.13	1.25	0.67
	Polish towns and cities	1057	170.32	99	240	20.55		

As regards the measurement of muscle strength (a dynamometer grip test), junior high school girls from Bydgoszcz were characterized by higher parameters across all age groups. 14-year-olds had better hand strength results than their peers by 10,67kg, 15-year-olds – 3,03kg and 16-year-olds – 3.78kg. The differences are statistically significant at the 1% level at the age of 14 and 16 and 5% at the age of 15 (Table 7).

Table 7 Handgrip test of girls (kg)

Age	Sex	N	$\bar{x}$	Min.	Max.	S	d	u
14	**Bydgoszcz**	178	**34.78**	3	38	22.98	10.67	6.17**
	Polish towns and cities	1646	24.11	7	45	5.56		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	**28.48**	2	42	16.13	3.03	2.49*
	Polish towns and cities	1186	25.45	7	46	5.88		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	**29.87**	5	41.5	19.26	3.78	2.81**
	Polish towns and cities	1053	26.09	8	47	5.86		

The 30s sit and reach test measures endurance of abdominal muscles. The results were better across subsequent age groups of the girls involved in the study. In this test girls from junior high schools in Bydgoszcz turned out to be better of all age groups against their peers from Polish towns and cities by 1,06; 2,78 and 3,18 cycles respectively. All these differences are statistically significant at the 1% level within the group of 14-year-olds and 5% in 16-year-olds (Table 8).

Table 8 Sit and reach test of girls (number)

Age	Sex	N	$\bar{x}$	Min.	Max.	S	d	u
14	**Bydgoszcz**	178	**22.7**	13	33	4.16	1.06	3.20**
	Polish towns and cities	1659	21.64	6	35	4.52		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	**24.71**	13	35.12	4.21	2.78	8.23**
	Polish towns and cities	1181	21.93	6	35	4.35		
Age	**Sex**	**N**	$\bar{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	**25.04**	13	37	5.17	3.18	2.31*
	Polish towns and cities	10.54	21.86	2	35	4.32		

Strength of shoulder girdle muscles was assessed by time measurement of bent arm hang on a bar. The results got steadily worse in subsequent age groups. In all tests, junior high school girls from Bydgoszcz turned out to be weaker when compared to their peers (by 0,63s, 1,3s and 2,24s respectively), but the differences were statistically significant at confidence levels in the group of 16-year-olds (Table 9).

In the 50m run test, junior high school girls from Bydgoszcz achieved better results within the group of 15-year-old girls. Their peers turned out to have worse results in all age

categories (0,57s, 0,13s and 0,87s respectively). The differences were statistically significant at the assessed confidence levels in the group of 14 and 16-year-olds (Table 10).

Table 9 Time of bent arm hang of girls (s)

Age	Sex	N	$\overline{x}$	Min.	Max.	S	d	u
14	Bydgoszcz	178	10.72	0	57	16.48	0.63	0.49
	Polish towns and cities	1542	**11.35**	0.1	60	11.44		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
15	Bydgoszcz	180	10.11	0	47.3	9.4	1.3	1.68
	Polish towns and cities	1121	**11.41**	0.1	60	10.8		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
16	Bydgoszcz	209	9.3	0	54.2	10.3	2.24	2.84**
	Polish towns and cities	1017	**11.54**	0.1	60	10.76		

Table 10 50m run test of girls (s)

Age	Sex	N	$\overline{x}$	Min.	Max.	S	d	U
14 lat	Bydgoszcz	178	9.37	6.9	14.3	1.68	0.57	2.62**
	Miasta w Polsce	16.57	**8.8**	7	12.1	0.72		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
15 lat	Bydgoszcz	180	8.96	6	14.3	1.43	0.13	1.19
	Miasta w Polsce	1133	**8.83**	6.2	12.1	0.76		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
16 lat	Bydgoszcz	209	9.64	6.9	19.42	1.99	0.87	6.23**
	Miasta w Polsce	1011	**8.77**	6.9	11.8	0.73		

Running endurance of girls was measured in the run at a distance of 800m. In all age groups better average results were achieved by junior high school girls from Bydgoszcz than their peers involved in the nationwide test.

Table 11 800m run test of girls (s)

Age	Sex	N	$\overline{x}$	Min.	Max.	S	d	U
14	Bydgoszcz	178	**226.82**	158	358	36.95	15.55	5.32**
	Polish towns and cities	1629	242.37	149	390	37.25		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
15	Bydgoszcz	180	**224.03**	141	440	40.67	16.8	5.23**
	Polish town and cities	1132	24083	158	357	35.87		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**U**
16	Bydgoszcz	209	**226.49**	144	390	44.41	15.07	4.63**
	Polish towns and cities	984	241.56	161	358	33.49		

The best results were shown by 15-year-old girl students from Bydgoszcz. The differences in results amounted to 15,55s for 14-year-olds, 16,8s for 15-year-olds and 15,07s for 16 year-olds respectively. All the differences are statistically significant at the 1% level (Table 11).

The 4x10m shuttle run results measured agility of the group of girls included in the test. Girls from Bydgoszcz achieved the best results in the group of 15-year-olds (11,8s). In all age groups girls from Bydgoszcz proved to be more agile than their peers included in the nationwide test. The groups of 15 and 16-year-olds revealed a statistically significant difference (1%) see Table 12.

Table 12 Shuttle run 4x10m of girls (s)

Age	Sex	N	$\overline{x}$	Min.	Max.	S	d	u
14	**Bydgoszcz**	178	**12.59**	8.7	17.29	1.92	0.02	0.13
	Polish towns and cities	1650	12.61	10	17.3	1.1		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	**11.8**	8.73	14.6	1.17	0.68	7.31**
	Polish towns and cities	1145	12.48	9.4	17	1.09		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	**12.18**	8.86	15.28	1.25	0.25	2.69**
	Polish towns and cities	1017	12.43	9.2	17.1	1.06		

Spinal flexibility was assessed in the standing forward bend test. Better test results were produced by junior high school girls from Bydgoszcz in the group of 14 and 15-year-olds by 12,67cm and in 15-year-olds by 17,77cm (a statistically significant difference at the 1% level). In the group of 16-year-olds, girls included in the nationwide tests turned out to be better by 1,73cm (a statistically significant difference at the 5% level) (Table 13).

Table 13 Standing forward bend test of girls (cm)

Age	Sex	N	$\overline{x}$	Min.	Max.	S	d	u
14	**Bydgoszcz**	178	**20.22**	-2	68	20.49	12.68	8.20**
	Polish towns and cities	1662	7.54	-15	26	7.02		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**u**
15	**Bydgoszcz**	180	**20.34**	-7	73	24.35	17.77	9.73**
	Polish towns and cities	1183	9.57	-15	28	6.99		
Age	**Sex**	**N**	$\overline{x}$	**Min.**	**Max.**	**S**	**d**	**u**
16	**Bydgoszcz**	209	8.81	-9	74	11.4	1.73	2.12*
	Polish towns and cities	1057	**10.54**	-15	27	6.59		

Table 14 Comparison of IPFT results achieved by 14-16-year-old girls from junior high schools in Bydgoszcz with those achieved by junior high school included in the nationwide test converted into points according to the T scale.

In the group of 14 and 15-year-olds, girls from junior high schools in Bydgoszcz achieved better results than their peers from other regions of Poland. In the group of 14-year-olds the total score was 415 points (an average result amounted to 52 points), in the group of 15-year-olds this score amounted to 434 points (an average result of 54 points). The groups of 16-year-old girls achieved the same result of 403 points (an average was 50 points).

The highest score was achieved by 15-year-old girls from Bydgoszcz. These results are also above the country's average as far as girls from Polish villages, towns and cities are concerned.

Table 14 Comparison results

TESTS	Girls aged 14		Girls aged 15		Girls aged 16	
	Junior High Schools in Bydgoszcz	Junior High Schools in Poland	Junior High Schools in Bydgoszcz	Junior High Schools in Poland	Junior High Schools in Bydgoszcz	Junior High Schools in Poland
STANDING FORWARD JUMP	45	51	50	51	52	52
DYNAMOMETER GRIP	50	47	50	49	51	49
SIT AND REACH	50	48	56	50	57	50
BENT ARM HANG ON A BAR	52	52	50	51	49	51
50M RUN	44	51	48	50	39	50
800M RUN	54	50	55	50	54	49
SHUTTLE RUN 4x10M	50	50	58	51	53	52
STANDING FORWARD	70	50	67	50	48	50
$\sum$	415	399	434	402	403	403
$\overline{x}$	51.87	49.87	54.25	50.25	50.37	50.37

The statement that the bigger biological development is the better motor skills are presented, which can be most frequently found in references, has become the starting point and the subject of discussion. This may suggest that there exist rectilinear relationships between somatic characteristics and motor skills. However, the occurrence of insufficiently strong linear relationships encourages one to make an in-depth analysis within this field. The

conducted nationwide study (Przeweda, Dobosz, 2003) shows that in some tests the statements concerning linear relationships have been proved, especially in the group of boys. Most tests revealed positive results in the case of the subjects of higher biological development, but there are also diversified results of motor skills depending on the test type, development age, sex and living environment. It has been proved that such somatic parameters as bodyweight, height as well as the amount of fat are conducive to achieving the best results, which undeniably affect the type of body build and these types in turn have influence on the results of motor skills. The connections between the analyzed somatic characteristics ought to be considered separately against the result of various motor skills and since they occur in diversified and multidirectional forms it is not possible to establish "standard values". This is also confirmed by Osinski (1988) who points out that the optimal value of somatic features to achieve the best results varies among speed, endurance and coordination tests.

For long has the phenomenon of human diversity been observed as regards size, proportions of different body parts or forms of reaction to environmental factors. On the territory of Poland, though inhabited by a community which is considerably homogenous in many terms, one may observe both regional and environmental diversification as far as body build is concerned. Body height is quite a distinguishing feature of a human being. Height is a polygenic characteristic, therefore, offspring may deviate widely from the values of this feature in their parents. The final values of this characteristic reveal a significant dependence upon environmental circumstances, especially on the quality of nourishment during progressive development (Malinowski 1978). Likewise, the research conducted in Poland shows differences in height depending on education and social structure. Similar findings were observed in longitudinal study carried out in the region of Bydgoszcz (Napierala 2000). The higher education or hierarchy in the social structure is, the bigger average height is attained. As the nationwide study performed by Dobosz and Przeweda (2003) as well as the study conducted on a regional scale (Napierala 2000, 2005, 2008) has revealed, the population of Polish towns and cities is bigger than rural population and the population of north-western Poland is bigger than this in the south-eastern area of the country. A tendency of differences in body height among population living in towns and cities and villages is decreasing due to migration of city population, particularly, the richest people to rural areas in the vicinity of cities.

There is no doubt about the fact that the standard of living affecting the development of a human being is diversified in particular regions of the country. The need to permanently

monitor somatic and motor development of a given population is desired so that in the case of marked differences it would be possible to counteract any negative tendencies. Differences occurring in Poland at a regional level, reflect disproportions within economic development and structure of particular territories.

When comparing study findings concerning the somatic characteristics of Kuyavia and Pomerania Region with nationwide research results, one should notice that standard deviations of the features tested in the above mentioned region are less sharp than in the nationwide study which may suggest that there are some somatic development related factors specific to a particular region. These may include geographical-economic causes and causes of pedeutological character (identity of educating teachers of physical education and identity of educating students). The cause of such a state may be connected with genetic predispositions (slight migration of the region population), but this fact needs to be examined thoroughly. Therefore, the region may serve as a starting point for conducting any comparative research (Napierala, 2005, 2008).

Physical development, sexual maturation rate, physical fitness, abilities to work and general wellness are major criteria of children and youth's health condition. A cross-sectional study was conducted every ten years in randomly chosen Polish schools representing the whole country. The study was performed in 1979, 1989 and 1999 and included children and youth aged 7-19. The study of Przeweda and Dobosz (2003) revealed a constant tendency of more intense growth and earlier physical maturation. These observations provide evidence of rather good health condition of the current young generation. However, changes in the level of physical fitness and abilities to work with youth tend to be decreasing during the period of twenty years. The findings of this study show that even if children and youth were better physically developed in 1999 (taller and heavier) than those tested in 1979 and 1989, their motor skills revealed a gradual decrease during that period (Przeweda, 2009, page 57-71).

CONCLUSION

Junior high school girls from Bydgoszcz are distinguished by a bigger body height across all age groups than their peers from other Polish towns and cities. Body weight is bigger in the group of 14-year-old girls whereas the remaining results reveal bigger body weight of peers included in the nationwide test.

Girls across all age groups represent mainly the leptosomatic type (14-year-olds: more than 65%, 15-year-olds: about 68% and 16-year-olds: above 80%). Quite a numerous groups

of girls of an athletic type can be found among 14-year-olds (about 31% and among 15-year-olds about 29%).

BMI values including the age of subjects indicate that a majority of female student included in the test have a proper body weight. The number of well nourished girls is systematically growing among subjects (about 76%, above 78% and about 82% respectively); the number of overweight girls is decreasing (about 22%, more than 17% and about 13% respectively).

Motor skills of the compared girls from junior high schools in Bydgoszcz against results of their peers of the nationwide test are diversified. Across all age groups better results were shown by juniors high school girls from Bydgoszcz in such tests as dynamometer grip, sit and reach, run at a distance of 800m, shuttle run 4x10m as well as standing forward bend (except for the group of 16-year-old girls). Peers included in the nationwide tests achieved better results in a 50m run, bent arm hang on a bar and standing long jump (except for the group of 16-year-old girls).

Upon converting motor skill results into points according to the T scale, junior high school girls from Bydgoszcz showed better results than their peers from other regions of Poland in the group of 14 and 15-year-old girls. The groups of 16-year-old girls achieved the same result of 403 point. 15-year-old girls from Bydgoszcz achieved the highest score.

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SOMATICKÉ ZNAKY A MOTORICKÉ ZRUČNOSTI DIEVČAT STREDNÝCH ŠKÔL MESTA BYDGOSZCZ V POROVNANÍ S ICH ROVESNÍČKAMI V RÁMCI CELOŠTÁTNEHO VÝSKUMU

SÚHRN

Cieľom príspevku bolo poukázať na rozdiely medzi somatickými znakmi a motorickými zručnosťami u žiačok stredných škôl mesta Bydgoszcz v porovnaní s ich rovesníčkami z iných regiónov v rámci celoštátneho výskumu, ktorý vychádzal zo štandardizovaných metód získavania údajov a realizoval sa v mesiacoch apríl, máj roku 2012 za účasti 567 dievčat (178 dievčat vo veku od 14 rokov, 180 dievčat vo veku 15 a 209 dievčat vo veku 16). Získané kvalitatívne a kvantitatívne údaje boli spracované Studentovým t- testom na 1% a 5% hladine významnosti, ktoré poukazujú v sledovaných somatometrických a motorických ukazovateľoch v prospech dievčat stredných škôl mesta Bydgoszcz oproti ich rovesníčkam.

KĽÚČOVÉ SLOVÁ: žiačky, somatické znaky, motorické zručnosti.

TRANSPARENCY OF MUNICIPAL GRANTS FOR SPORTS: SLOVAKIA

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SUMMARY

A significant portion of public budgets in Europe is spent on sport subsidies, both on central and local levels. Our paper investigates the transparency and reliability of the decision-making process in the allocation of sports grants on a municipal level in Slovakia. It demonstrates that the situation is improving, but some mechanism are still lacking, resulting in some risk of fraud.

KEY WORDS: sport policy, municipalities, transparency, subsidies.

INTRODUCTION

A significant portion of public budgets in Europe are directed towards sports subsidies. The economic argument for such a trend are positive externalities (Stiglitz, 2000; Nemec, 1998) the institutional argument is the European Union`s (EU) belief that "in grassroots sport, equal opportunities and open access to sporting activities can only be guaranteed through strong public involvement." (Nemec – Medved – Šagat, p. 3, 2009). On the other hand public subsidies especially at the EU level can be considered as a kind of new fiscal illusion (Maly, 1998). The most recent available comparative figures show that in 2008, European national governments spent €10.7 billion on sports, i.e. €21.5 per person, per year. The funding of sports from government at the local level is estimated to be even 2.5 times as high (€26 bn). However the evaluation of this spending is still below the expectations of common rationality (Ochrana – Nekola, 2009; Uramova – Pisar – Sipikal, 2010).

One of the main goals of spending public money on sport is to increase participation. Previous research on individuals and sport organizations showed that participation in sport serves important goals such as improved health and social cohesion (http://ec.europa.eu/sport/library/documents/f-studies/study-funding-grassroots-sports-

finalreport-vol2.pdf). However, as the same study on grassroots sport funding in the EU showed, sports participation is still rather low. In Slovakia, participation in sports is far below the European average.

AIM

One reason for evaluating local government expenditure on sport might be to explore its efficiency and transparency. Our analysis addresses data related to the actual practices of selected municipalities in funding sport organizations, and examines the availability and quality of information about the process for providing grants to sports NGOs.

METHODOLOGY

As the main method of our research, we used the analysis method. We analyzed and compared the available information on the public sourcing or grants of sport in seven Slovak municipalities.

RESULTS AND DISCUSSION

Public financing of sports organizations in Slovakia

This section describes the financial relationship between governments and sports sectors in Slovakia. There are four main sources of revenue for the sports sector: the national government, sub-national government, lotteries, and participants. Figures 1 and 2 show the level of public finance provided for sports by the different levels of government (we include also the Czech Republic as benchmark). The bulk of resources come from self-government budgets (regions and local municipalities taken together).

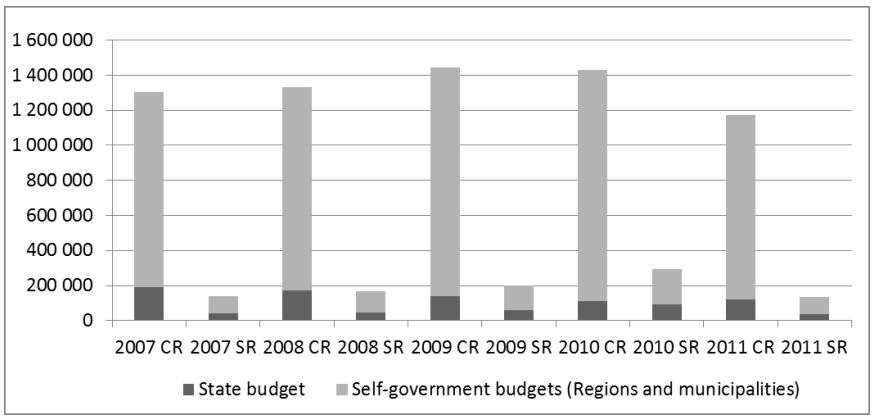

Figure 1 Public expenditures on sports Czech Republic (CR) and Slovakia (SR), 2007- 2011 (thousand EUR) (Source: KPMG 2012a, KPMG 2012b, own calculations)

The comparable KPMG (http://www.olympic.cz/public/img/dokumenty/koncepce financovani_sportu_prezentace_v9a.pdf and www.olympic.sk/publikacie/dalsie-publikacie /365-kpmg-koncepcia-financovania-portu-skratena-verzia/download.html) data indicate that public grants for sports as a percentage of GDP is much higher in the Czech Republic than in Slovakia, although both are low in EU terms. Data also show some impact from the current financial crisis, especially in the dramatic decrease in Slovakia's 2011 spending.

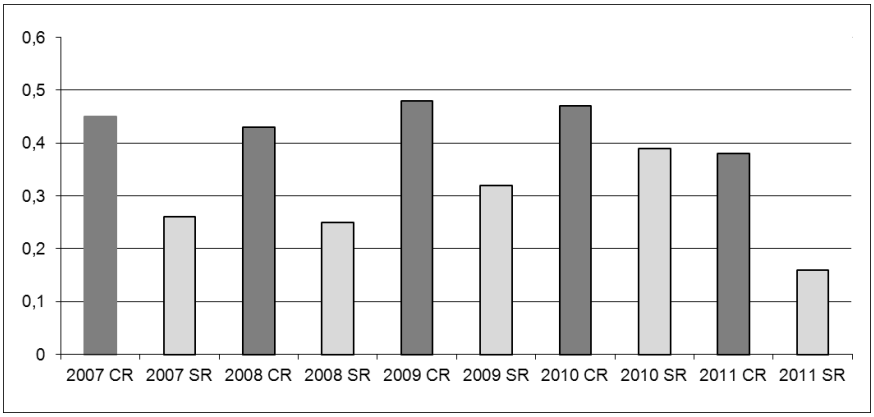

Figure 2 Public expenditures on sport as % of GDP (Source: KPMG 2012a, KPMG 2012b, own calculation)

Transparency of allocation of municipal grants to sport

Slovak national government allocates funds for sports on the basis of transparent competitive and mainly formulae-based performance financing, which means that these processes are not only transparent, but also predictable and reliable (Nemec – Medved – Šagat, 2009). As data above indicate, the main channel for public money for sports is the support of sport organizations by local governments (Pavlik, 2013). Are these processes also fully transparent, reliable and predictable? Below we analyse the situation in Slovakia.

For Slovakia Nemec (2007) analysed the transparency of allocation of municipal grants in Slovakia – by investigating web pages of seven cities that were seats of regional self-government. The results are summarised in Table 1.

Table 1 Transparency, predictability and reliability of providing municipal grants for sports – Slovakia (Source: Nemec, 2007)

	The grant scheme is available from city webpage and sets out criteria.	The grant scheme is available from city webpage but does not set out criteria.	The grant scheme is not available from the city webpage.
city	Banska Bystrica	Kosice, Presov, Zilina, Trnava	Bratislava, Nitra

These first findings suggest that not all cities had established transparent rules on financing non-governmental sports bodies involved in delivering public functions in sports. Only one city produced a "real document" which could have been a rulebook guaranteeing impartial, transparent, effective, predictable, reliable and accountable decision making process for allocating municipal resources.

To achieve continuity we repeated the same exercise for Slovakia in 2013. The results shown in Table 2 are not very positive, especially when we consider that general public finance rules require the existence of transparent, predictable and reliable schemes.

Table 2 Transparency, predictability and reliability of providing municipal grants for sports Slovakia, 2013

The grant scheme is available from city webpages and sets out criteria.	The grant scheme is available from city webpages but does not set out criteria.
Kosice - partly (the "public" scheme covers only support for youth sport (66% of allocated funds) and the organising of sport activities (34 %). Financing of senior sport is not part of the "public" scheme. Presov - partly (the total sports grant is distributed as follows – 55 % core senior sports (football, ice-hockey and handball), 35% other senior sports, 7 % organising of youth sports activities, and 3 % the rest). Concrete criteria cover only youth sport activities. Zilina – partly. Applicants are ranked on the basis of the number of members and specific coefficients. However, this ranking is used mainly for an eligibility check – minimum is 15 points.	Banska Bystrica: grant applications are evaluated by Lord Mayor or the sport committee of the municipal assembly, depending on the amount requested. Lord Mayor or municipal assembly approve grants, depending on sum. Trnava: all applications are evaluated by the municipal assembly committee. Municipal assembly approves all grants. Bratislava: all applications are evaluated by the special grant commission, nominated by the Lord Mayor. The Lord Mayor decides. Nitra: all applications are evaluated by the municipal assembly committee. Lord Mayor or municipal assembly approve grants, depending on the amount requested.

CONCLUSION

This paper investigated municipal level sports sector subsidies in Slovakia. The research showed that there is indeed a problem in relation to subsidising sports organizations. Actual decisions about subsidies, funds, and grants from local authorities to sports organizations deviate from the expected norms and standards. The decision-making processes do not follow clearly stated principles. The criteria on which grant decisions should be based are often unavailable or non-existent.

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TRANSPARENTNOSŤ MESTSKÝCH DOTÁCIÍ PRE ŠPORT: SLOVENSKO

SÚHRN

Významná časť zdrojov z verejných rozpočtov v Európe pripadá na športové dotácie, a to ako na centrálnej aj miestnej úrovni. Naša práca skúma transparentnosť a spoľahlivosť procesu rozhodovania pri prideľovaní športových dotácií (grantov) na úrovni obcí na Slovensku. Poukazuje na skutočnosť, že v porovnaní s rokom 2007 sa situácia zlepšuje. Naďalej však absentuje jasný mechanizmus, ktorý by mal za následok zníženie možného rizika nepoctivosti procesu.

KĽÚČOVÉ SLOVÁ: športová politika, obce, transparentnosť, dotácie.

VOLUNTARY RECREATIONAL PHYSICAL ACTIVITIES AS A PART OF ELEMENTARY SCHOOL PUPILS LIFE STYLE

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SUMMARY

The author of the contribution deals with the issue of the importance of motor activities as a means towards shaping a healthy lifestyle. She points out possibilities of leisure activities by means of participation in voluntary recreational physical education within elementary schools available at selected schools. Pupils thus enrich and contribute positively to their present lifestyles.

KEY WORDS: pupils´ lifestyles, voluntary recreational physical education, motor activity, elementary school pupils.

INTRODUCTION

The issue of forming a healthy lifestyle plays one of the key roles in the current educational theory and practice.

Without increasing the awareness of students themselves it is impossible to secure high quality readiness for life of the future youngsters in the current conditions.

Rising diversity of academic disciplines and the zeal for knowledge lead to higher appreciation of the educational process, will strengthening, development of mind and physical strength, and evoke faster cognition processes.

The educational process in elementary and high schools demands higher requirements for self-discipline, and provokes the wish and art of leading a healthy life style. One of the key roles of the educational process is to take care of one's health.

Teachers working in the field of healthcare and physical activities are an important element in motivating their students to physical activities. This can be done within PE classes or by organizing voluntary recreational physical activities. Teachers thus develop incentives in pupils to acquire a healthy life style (Medeková, 1995).

The necessary condition for an active and content life is long term health which needs to be taken care of consciously.

Nowadays we can witness a fundamental decrease in both physical and spiritual abilities of school pupils, burn-out syndrome, and illness susceptibility due to the current socio-economic situation in many countries, more stress causing situations, as well as increased intensity of the educational process. As a result we notice a very low value of a healthy lifestyle in the social awareness of the young generation. The majority of the population lacks an understanding of the necessity of actively taking care of their health. They show little interest in regular physical activities.

Based on their research the authors Belej (1992), Boržíková (2006), Chovanová (2005), and others claim that the representation of physical activities in young population is currently insufficient regarding the present day requirements. Based on the research of many authors, Jedlička (2009) claims that the standard of physical activities from the point of view of health improvement in young generation is unsatisfactory. There is a strong tendency in the schooling system to change the current situation. Healthy life style is one of the main modules of PE programmes through which teachers try to create a positive impact on the development of a healthy life style in the young generation.

A school is one of the institutions that participate on the pupils´ education outside schools mainly by directing young people to positive free time activities (Liba, Uherová, 2003). Considering the principles of education humanization and democratization it is necessary to create suitable conditions for sport activities based on interests and personal preferences of pupils.

One of a teacher's role is to motivate pupils to a positive attitude towards sport activities. This can be done by organizing voluntary recreational physical activities by means of after school activities and hobby groups based on pupils´ interests.

The above mentioned reasons motivated us to the following research.

AIM

The aim of this work was to find out the way of spending free time in pupils of selected elementary schools as well as the pupils´ utilities of voluntary recreational physical activities in case the school provides such.

METHODOLOGY

Five city and five country public schools in the region of Trenčín were involved in the

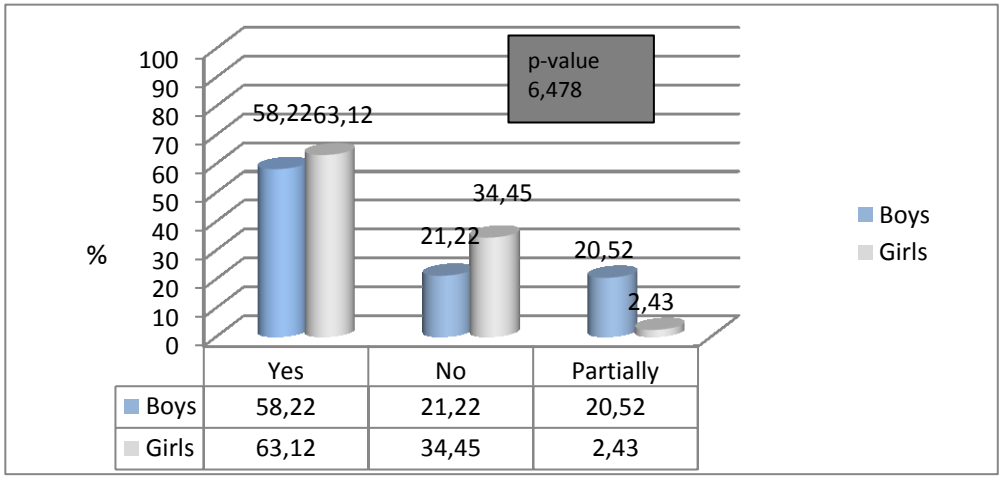
research. The research group consisted of pupils of eight grades of selected elementary schools. The total number of respondents was 356 of which 174 (48,87%) were boys and 182 (51,12%) were girls. The primary method of gathering the data was by the means of questionnaires. There were all together 10 questions. These were close-type questions with a choice of several options.

The results obtained by empirical methods were evaluated by qualitative and quantitative research methods. In order to evaluate the data we used methods of descriptive statistics (graphs, percentage expressions, descriptions) and inductive statistics (chi-square test = χ^2).

RESULTS

The results are presented in the order of individual items in the questionnaire.

In question 1 we wanted to know how favourite PE is with pupils of selected elementary schools.



	Yes	No	Partially
Boys	58,22	21,22	20,52
Girls	63,12	34,45	2,43

Figure 1Popularity of PE classes

From the results of the research it is evident that more than 50% of all respondents marked the PE as a favourite subject (58,22% of boys and 63,12% of girls). Authors Görner – Starší (2001), and Bartík (2009) show similar results in their publication. There were some respondents who claimed PE as not a favourite subject – 21,22% of boys, and 34,45% of girls (Figure 1). In spite of the increasing number of non exercising pupils and often improper conditions for the realization of PE classes our research as well as research of other scholars (Görner – Starší 2001; Antala – Dorošová, 1996; Michal, 2011) confirm that PE classes still belong to the most favourite school subjects. Using chi square test we calculated the statistical

significance of the difference between girls and boys. For the significance level of 0,001 the difference between girls and boys in likeness of PE is statistically different.

Second question was whether respondents devote their free time to physical activities.

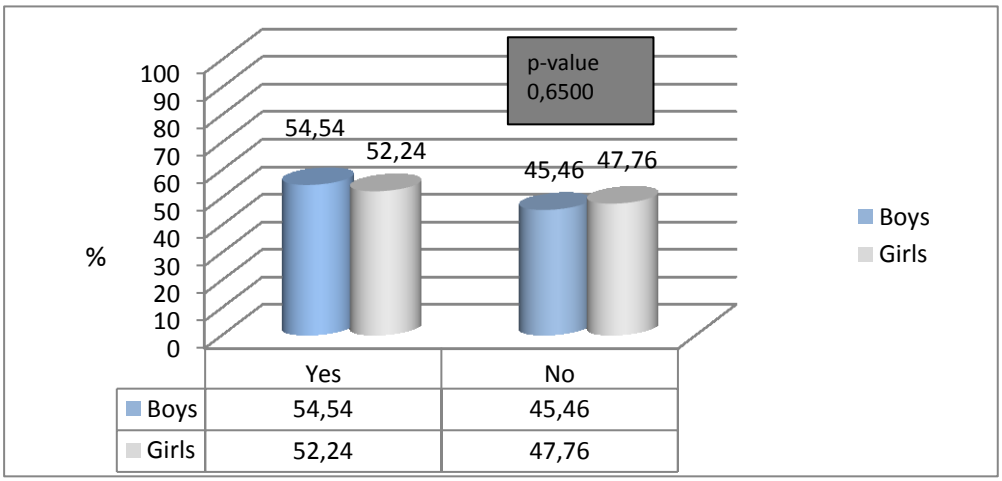


Figure 2 Sport activities of pupils outside PE

As in the previous question, the answers to this question were mostly positive. Boys do sports outside PE classes in 54,54% and girls in 52,24% (Figure 2). Similar results were obtained by Adamčák – Nemec (2011) who found out that boys do sports outside PE classes more than girls. However, there is no statistical significance in participation in sport activities outside PE between girls and boys. Referring to this question we were interested in knowing the incentives of those pupils who do not do sports. The most frequent reason was lack of time (19,52% of girls and 24,22% of boys) and financial issues (15,6% of girls, and 12,02% of boys, Figure 3).

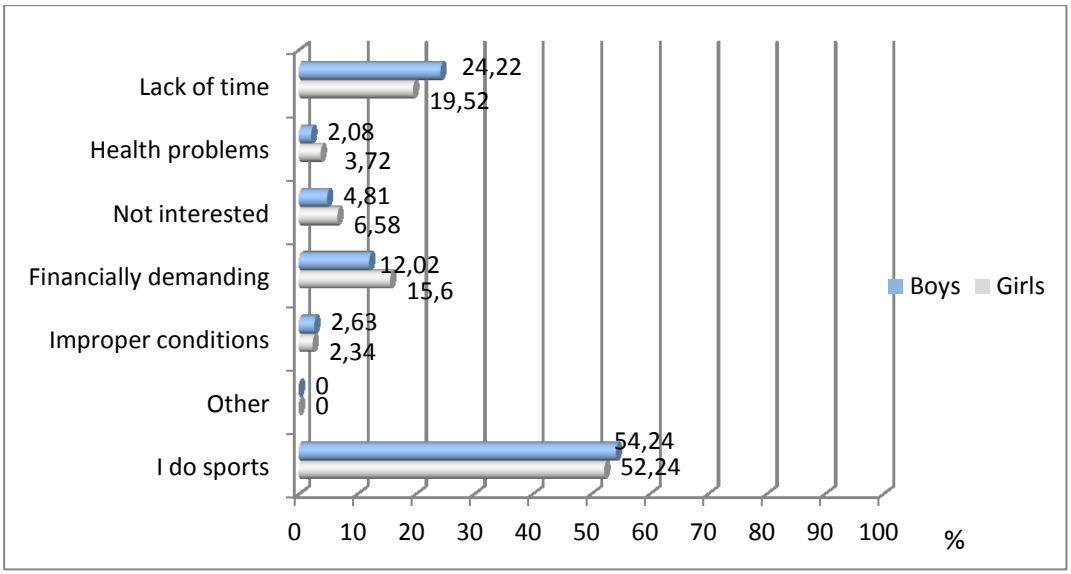


Figure 3 Reasons for not doing sports in pupils of elementary schools

These results comply with the survey of public opinion of the European Commission – Eurobarometer, which was conducted from October 2 to October 19, 2009 in 27 member countries of the European Union (http://zdravie.pravda.sk/preco-slovaci-nesportuju-nemaju-vraj-cas-fph-/sk-zrelax.asp?c=A100329_170344_sk-relax_p31), according to which almost half the population of Slovakia do not do sports because of lack of time. Particularities of this research can be seen in Figure 3.

The following question inquires about the way of spending free time. Free time activities are typical for their diversity and multiplicity. The selection of a free time activity in real life depends on an individual's interests, needs, opportunities, and personal conditions.

We wanted to find out which activities were preferable. 31,33% of boys and 27,88% of girls spend their free time at PC´s. However, it is quite positive that 31,54% of boys and 26,56% of girls like doing sports in their free time.

The respondents do not forget to practice physical activities, which we perceive positively since physical activities advocate healthy psychological and physical development and have a great impact on other health issues. Further results are shown in Figure 4.

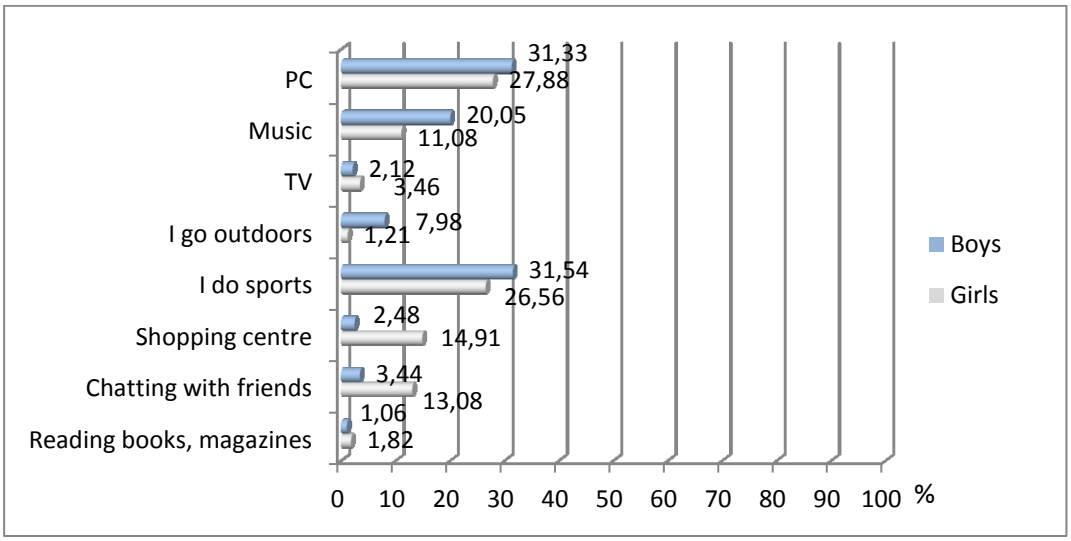


Figure 4 Free time activities

Many different institutions take part in organizing free time activities. These institutions have their specifications and special focuses. Pávková (2008) claims that schools have a dominant position among these institutions. Motor activities on a recreational level are extremely important for human health. We agree with the opinion of Jedlička (2009) that recreational motor activities are an irreplaceable part of free time. Their contents and composition depends much on the particular economic standard of the society, including the

school system. We questioned pupils whether school organizes any voluntary recreational PE in the forms of hobby groups. More than half of the respondents (60% of boys and 54,34% of girls) claimed that the school they visit organizes recreational PE, Figure 5.

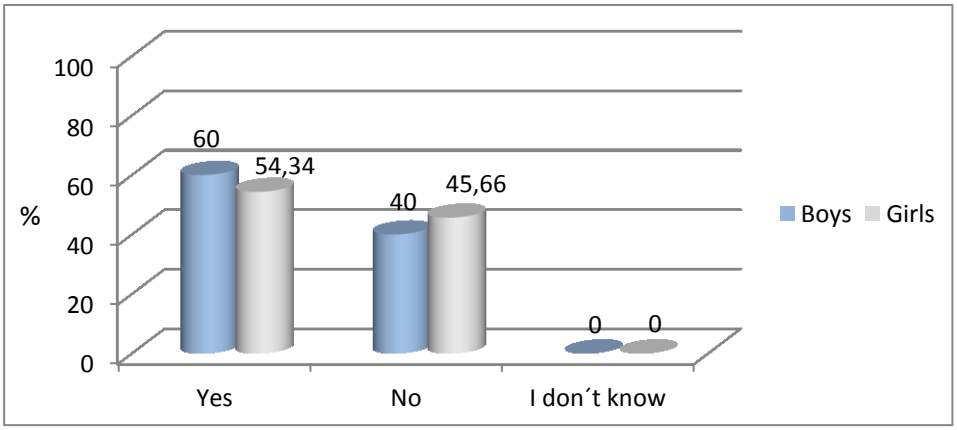


Figure 5 Recreational PE at elementary schools

There are significant differences between boys and girls in the participation in recreational PE in behalf of boys. 38,56% of boys and only 24,24% of girls participate in the afterschool PE (Figure 6). The chi-square test confirmed the statistical significance between girls and boys as for the participation in recreational PE. The level of significance was 0,01.

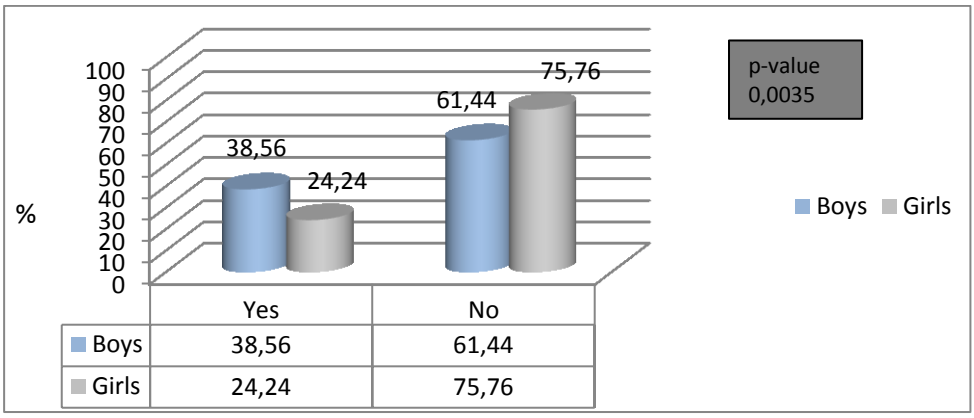


Figure 6 Participation in recreational PE

Since we investigated the pupils´ interest in recreational PE we also wanted to know what particular motor activities they prefer in the framework of the recreational PE.

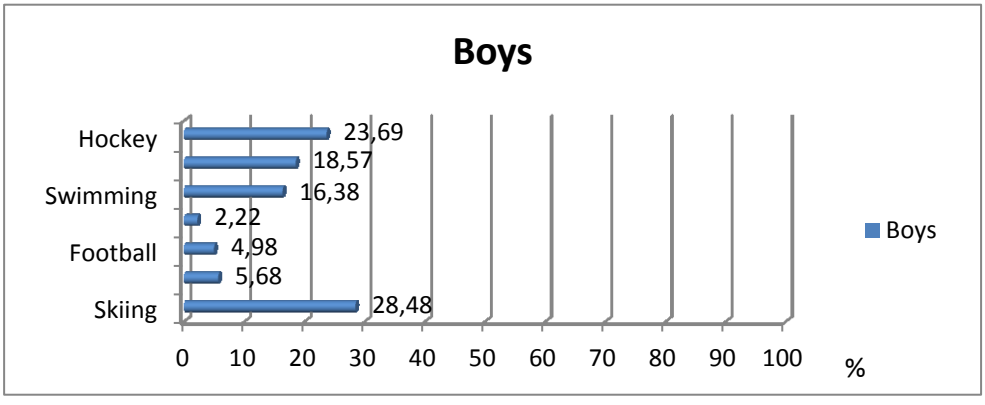


Figure 7a Preferable physical activities (boys)

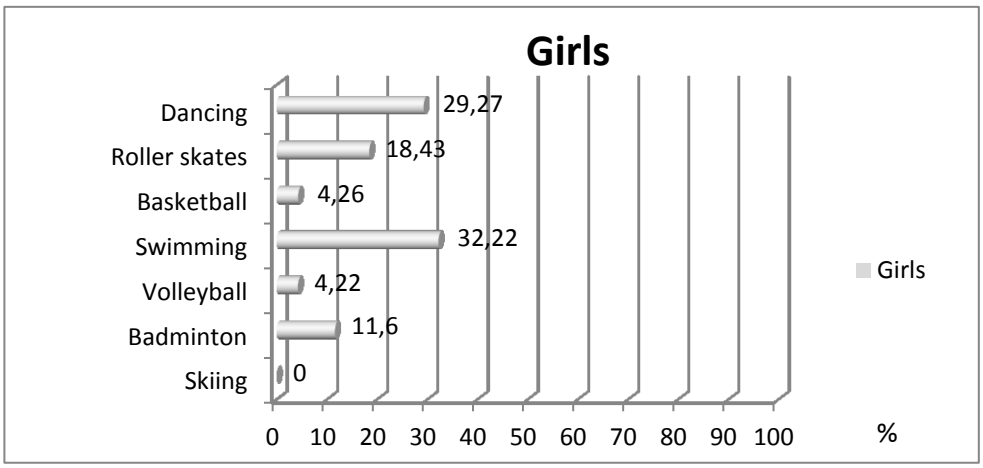


Figure 7b Preferable physical activities (girls)

This item showed significant differences between boys and girls too. Boys prefer skiing (28,48%) and ice-hockey (23,69%) while girls prefer swimming (32,22%) and dancing (29,27%). Liking for skiing was quite significant in the research of Beťák (2013) conducted in secondary schools in the region of Martin.

The actual results of preferable physical activities of elementary school pupils are presented in Figures 7. Every individual shapes their lifestyle by the way they choose to spend their free time. We think that the degree of benefit of free time activities depend on person's interests, hierarchy of their needs, value orientation, aims, and also the level of education and general awareness. One of the important factors of a healthy life style is the need for everyday physical exercise through active or recreational sports. This view is confirmed by works of Bartík (2009), Kasa (2005), Michal (2002, 2010), Šimonek (2010) and others. The last questions investigated what pupils understand by the term healthy life style and what their opinion is regarding the impact of physical activities on human health. From the results it is evident that more than half of the pupils in the second level of elementary schools (56,68% boys, 59,12% girls) are aware of the fact that physical activity is the most important part of a healthy life style. Chi square test showed a statistically significant difference between girls and boys in the concept of life style. The significance level was 0,05 (Figure 8).

In the last item of the questionnaire all respondents (100%) stated that physical activity has a positive impact on human health. We suppose that this awareness comes from the

primary socializing process (family background) followed by the educational process of the schools through the PE classes (module of a healthy life style, and health and its disorders). Kotyra (2010) in a similar way claims based on his research that health is the greatest value in secondary school students.

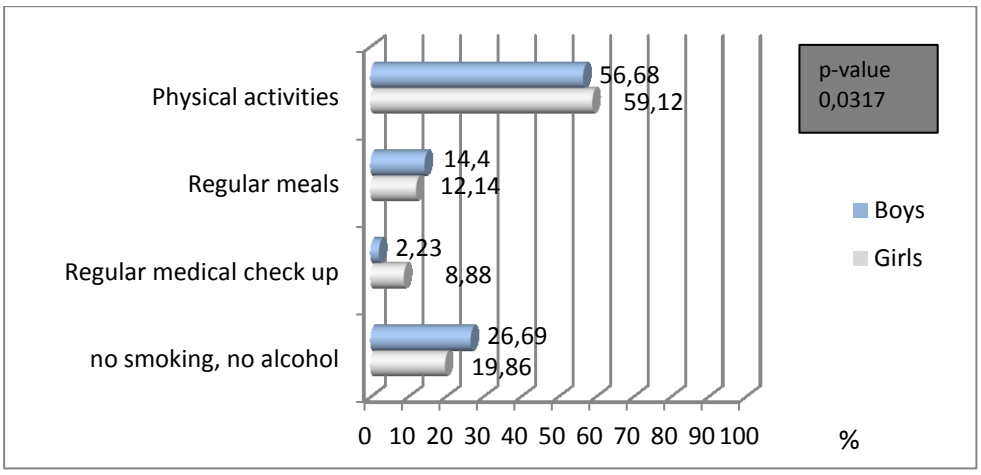


Figure 8 Perception of a healthy life style

CONCLUSION

There is an undoubted connection between physical activity and a healthy life style.

The relation between the physical activity and human health is confirmed by Drobný (2006) based on his research. Currently we witness a decrease in pupils´ interests in physical activities. Liba (2000), Müller (2005), and Rozim (2005) agree that in pupils a passive way of spending free time is prevalent nowadays. It has been proven that a physical activity is an important part of a human life. All physical activities, whether regular or recreational, have a positive effect not only on our physical health but also on psychological wellbeing.

Our results show that the respondents do devote their free time to some physical activities – boys with 54,54% almost equally as girls with 52,24%. Based on these results we can claim that more than half of the respondents (56,68% of boys and 59,12% of girls) are aware of the importance of a physical activity in a healthy life style.

Based on the results we propose the following recommendations to be implemented in practice:

- constantly improving the educational process in the field of afterschool physical activities,
- finding out interests of pupils and implement those sports in the recreational PE in which they showed the biggest interest taking into consideration the possibilities and conditions of individual schools,
- creating an interesting offer of non-traditional sports within the framework of the

recreational PE,

- modernizing the contents of PE classes as well as recreational PE by use of different forms and methods of training.

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ZÁUJMOVO REKREAČNÁ TELESNÁ VÝCHOVA AKO SÚČASŤ ŽIVOTNÉHO ŠTÝLU ŽIAKOV ZÁKLADNÝCH ŠKÔL

SÚHRN

Autorka príspevku sa zaoberá problematikou potreby pohybových aktivít ako prostriedku k vytváraniu zdravého životného štýlu. Poukazuje na možnosti využívania voľného času prostredníctvom zapojenia sa do záujmovo rekreačnej telesnej výchovy v rámci základných škôl, ktoré žiaci vybraných ZŠ majú možnosť navštevovať, čím dotvárajú a obohacujú svoj aktuálny životný štýl.

KĽÚČOVÉ SLOVÁ: životný štýl žiakov, záujmovo rekreačná telesná výchova, pohybová aktivita, žiaci základných škôl.

THE INFLUENCE OF FITNESS PROGRAMME FOR SELECTED MOTOR ABILITIES OF JUNIOR TEAM HOCKEY PLAYERS DURING THE PREPARATON PERIOD

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SUMMARY

The present contribution records and evaluates training load by deliberate fitness program of junior team HC 05 in the season 2013/2014 in 9 week mesocycle. The aim of contribution is to verify the effects of deliberate fitness program for the selected motor skills by comparing the recorded values of input and output general motor tests. By evaluating tests, we concluded that our implemented fitness program had an effect on selected motor skills. In all tests we observed an improvement and statistically significant dependence.

KEY WORDS: training load, deliberate fitness program, influence, ice hockey, general motoric tests.

INTRODUCION

Ice hockey is characterized by speed and toughness of games, due to it ranks among the most attractive team sports in the world. Currently in professional leagues play 80 to 100 games in the season, which increases the demand on condition readiness of players. Players in the game repeated game situations several times in a row and only have a short time to recover. Condition of the player which results from condition training is the mental and physical condition of the player, which affects sport performance.

We focused on the junior age group (17-20 years), which in terms of physical maturity of players is similar to the senior category. In terms of intensity and the deployment in the game, the junior categories equalized with senior categories, what increases demands on the players fitness. For these reasons, it is necessary to focus on the complexity, volume and intensity of training load during the preparation period.

Sporting activities in ice hockey are expressed by achieving maximum sports performance in the form of sport performance.

Each sport performance is a certain comprehensive system, which has its own structure given by a certain arrangement of factors with the relationships between them (Starší, Starší, 1981).

One factor that significantly affects sport performance is the fitness component. Furthermore we will focus only on the component of sport performance which is development of motor skills (Table 1).

Table 1 Structure of motor skills in ice hockey

Limiting	**Determining**	**Additional**
Coordination	Endurance and speed	Endurance in strength
Acceleration speed	Aerobic performance	The maximum cyclic speed
Maximum acyclic speed	The maximum force	Flexibility
Explosive strength		

Source: Bereš, 2010

Sedlacek et al. (2003) defines **fitness abilities** as the set of internal preconditions to perform physical activities based on the performance of physical tasks. On the development of fitness skills is focused fitness training.

Fitness abilities are those movement abilities that are highly conditioned by particularly functional and energy options of sportsman body (cardiovascular, respiratory, neuromuscular system, etc.). These processes are determined by sportsman morphological structure and its functions (Moravec et al., 2007).

Fitness training is focused on the development of motor skills and the development of functional potential of players. The level of fitness abilities determines qualitative aspects of physical performance. The physical training is closely related to building of bioenergy potential of sportsman needed to cover the energy sporting activities (Výboh, 2010).

Moravec et. al (2007) state that physical training is focused to induce adaptive changes in an sportsman's body, primarily with a focus on the development of motor skills (conditioning character).

Among fitness abilities we include endurance abilities that are responsible for the implementation of long-term motor skills.

According to Šimonek et al. (1987) endurance player's skill in general determine the following factors:

- ability of the organism to change chemical energy into mechanical (aerobic and anaerobic mode),
- resistance of the organism against adverse changes in the indoor environment,
- stability of psychological states of sportsman (volitional qualities),
- Level of technical and tactical readiness (decides on economy energy output).

Parts of fitness abilities are speed abilities that are responsible for the implementation of short-term physical activity as possible.

We include speed abilities in conservative, difficult to develop and high genetically determined. Despite the fact we know the possibilities of their development. It is important to start with but their influence in the optimum, sensitive periods, ie. 10-14 years of age (Koštial, Kampmiller, 2003).

Further fitness abilities are power abilities. A certain level of these skills is necessary for development of sport performance in many sports industries.

Strength, more precisely power abilities is generally associated with overcoming resistance. In ice hockey has a resistance various forms - from activities of rival through the body weight, inertia while skating, and activity of player to the weight of equipment (Kostka– Bukač – Šafařík, 1986).

The final fitness ability is the flexibility, which is according to Zrubák (1981) the ability of the organism perform the movements of the whole body and its parts on a large scale amplitude. The flexibility depends mainly on the anatomical structure of the joints, flexibility of joint ligaments, tendons and muscles, but also by their forces.

On the development of mentioned fitness abilities, we focused in the training process during the preparation period.

Training load is targeted deliberately created and controlled stimulus (especially selected physical activities - training exercises, word, instruction ...), by which we cause changes of sportsman´s fitness with the, conditioning the increase of the sportsman´s performance. The effectiveness of training load in terms of adaptation processes depends on the size and condition of sportsman´s fitness (Moravec et al., 2007, Kampmiller et al., 2012).

From a practical point of view, the training process must distinguish load:

- Exterior is an important tool for the trainer, but also for the players themselves. They determine quantitative parameters applied by the training exercises and completed training units (volume, intensity, complexity ...).
- Internal, allows to determine the purpose of peace training load (SF, lactate, O2 ...), to assess the size of the functional capabilities of the organism and its impact on the development of trainability (Holienka et al., 2012).

In the training practice, we distinguish four function of load:

- function development - aim is to achieve more progressive improvements in sports performance and its constituent units, to a maximum,
- stabilization function - aim is to sustain the stage reached of trainability and performance,
- renovation function – aim is to recover maturity, age and performance (after an injury, illness),
- function recovery – aim is active rest, i.e. load its content and intensity does not produce greater tiredness (Pavlis et al., 2003).

As we mentioned fitness abilities we divide on: endurance, speed, power abilities and flexibility. The content of conditioning training outside of ice is mainly specialized exercises designed to develop motor skills. With regard to ice hockey obtain preference development of speed, speed-power, power, power-endurance and dexterity abilities. The general character has this type of training only in transitional and the preparation period (Pavlis et al., 2003).

The preparation period shall be considered as the most important period in the annual training cycle. It has to establish the foundations of future performance and ensure conditions for further growth performance. A lot of experience indicates that the underestimation of training during the preparation period or its substantial reduction has mostly resulted in stagnation of performance (Dovalil et al., 2009).

The preparation period in ice hockey is divided into two mesocycle. First mesocycle focuses on general fitness abilities and second mesocycle focuses on specific fitness abilities.

According to Laczo (2009) is first mesocycle realized outside of ice and lasts 6-8 weeks, its aim should be to increase alactacid and aerobic bio-energy options of players. In the small scale, training load focus on the development of lactic abilities. The intention creates adequate conditions for effective continuity of training program for the second

mesocycle. Second mesocycle takes place about 80% to 20% outside ice. The aim of second mesocyle is the transformation of individual fitness abilities changes that were achieved in the first mesocycle to individual techniques and tactical skills on the ice.

AIM

The aim of article is to verify the effects of deliberate conditioning program on selected motor abilities junior team hockey players during the preparation period.

METHODOLOGY

In this article, we used a single-quasi-experiment. It was the interindividual type of research.

$V_{(20)}(S_9)$ to → P $V_{(20)}(S_9)$ t_1

V – juniors HC 05 Banská Bystrica

$_{(20)}$ - number of players

S - states

to - 01.05.2013

t_1 - 24.06.2013

The research group consisted of 20 players of junior team HC 05 Banská Bystrica aged 16-19 years (mean decimal age of subjects is 17.2 years). Team during the reporting period was preparing for the season 2013/2014, when will operate in the Slovak Extraliga of juniors, organized by the Slovak ice hockey association. The preparation period, which is part of the annual training cycle (Table 2) lasted nine weeks from 29.4.2013 to 28.6.2013 and has been implemented 76 training units in a total volume 7,600 minutes.

Table 2 Annual Training Cycle in ice hockey

<table>
<tr><td>The transition period</td><td>April</td></tr>
<tr><td rowspan="2">The preparation period I.</td><td>May</td></tr>
<tr><td>June</td></tr>
<tr><td rowspan="2">The preparation period II.</td><td rowspan="2">July</td></tr>
<tr><td>August</td></tr>
</table>

precompetitive period	August
	September
Competition period	October
	November
	December
	January
	February
	March

Source: own processing

The frequency of practice was 9 trainings per week, 1 x Monday, Tuesday and Wednesday, 2 x daily, 1 x Thursday, Friday 2 x and every second Saturday 1 x daily. Sunday was day off. Four times a week was training in the ice stadium areas, where gym, in-line area and gym were available. Once a week was training realized in the football complex, which was available, as a basketball court and once in rugged terrain. Training unit length varied depending on the character of training, 80-120 min. We have devoted input and output test to two days together. We focused on recording training load during the preparation period mesocycle week 9 (Table 3).

Table 3 Example of weekly training microcycle during the preparation period - 2nd week

The content of load
Monday (05/06/2013) IP - warm up (15 '), MP - speed (30'), group training – 1st group skill (15 '), 2nd group force (15'), 3th group agility (15 '), ZC - stretching (10') total (100 ')
Tuesday (05/07/2013) 1st phase IP - warm up (15 '), side steps over hurdles (10'), MP - group workout – 1st group strength LL (25 '), 2nd group force UP (25'), power center of the body (10 '), MP - stretching (10') total (95 ') 2nd phase IP - warm up (10 '), physical game (10'), MP - endurance development (50 '), game (30'), stretching (10 '), total (110')
Wednesday (08/05/2013) 1st phase IP - warm up (15 '), force LL, UL (60'), shooting (20 '), FP - stretching (10'), total (105 ') 2nd phase IP - warm up (15 '), of games (10'), MP - endurance (60 '), stretching

(10'), a total of (95 '), regeneration
Thursday (5/9/2013) IP - warm up (15 '), MP - hockey (60'), FP-compensatory exercises and stretching (20 ') total (95')
Friday (05/10/2013) 1st phase IP - warm up (15 '), side steps over hurdles (10'), MP - group training - strength LL 1st group (25 '), 2nd group power UL (25'), FP - skipping (10 '), stretching (10') total (95 ') 2nd phase IP - warm up (10 '), of games (10'), MP - tabata (60 '), FP-stretching (10'), total (95 ')
Saturday (11/05/2013) IP - warm up (10 '), MP - skating (60'), skating (10 '), FP - stretching (10'), total (90 ') swimming pool, wellness
Sunday (12/05/2013) active rest

Legend: IP-introductory part, MP- main part, FP -final part, LL-lower limbs, UL-upper limbs

Source: own processing

The influence of deliberate program was analyzed on the basis of changes of monitored indicators. Input measurements were performed 1.5.2013 and were attended by 20 players. 25 players participated in the preparation. 20 players took part in the input and output measurements, and so we just watched the status changes to them. The following Table 4 shows the general training indicators.

Table 4 General training indicators

General training indicators	**Preparation period**			
	April	**May**	**June**	**Total**
Number of calendar days	30	31	30	91
Number of training days	2	25	22	49
Number of training units	3	38	35	76
Number of days of rest	0	6	8	14
Number of days of testing	0	1	1	2
Number of days of regeneration	0	8	5	13

Source: own processing

To obtain the data we used the method of measurement and comparison of data from the input and output tests. We conducted standardized general motor tests under SZĽH.
Standardized general motor tests:

- run at 40 m with changes in direction (speed changes of direction),
- long jump on one leg from the place (explosive strength of lower limbs),
- agility test - Illinois (speed capability),
- sit - lie down, (dynamic strength of abdominal muscles),
- pressure weights lying on a bench with 70% of its own weight (strength of upper limbs),
- endurance boats run - beep test (aerobic endurance).

We tested on an elementary school Golianova, Banská Bystrica. The resulting values of input and output tests were compared and quantified the differences. Status changes are characterized by the following statistical characteristics:

- arithmetic mean (x)
- median (Me)
- variation margin (Vr)
- the standard deviation (s)
- variance (s2)
- minimum value (xmin)
- the maximum value (xmax)

Differences between the input and output indicators was evaluated in terms of statistical significance through two selection paired T test, which determined us the level of statistical significance. It is used for the evaluation of experiments, where we do not know the mean of the population, and comparing only two sample data files. These data can be obtained by two measurements realized repeatedly in the same group of individuals (typical measurement before and after application of the experimental factor - so called. "pair experiment " or "dependent samples") or two independent groups of measurements ("unpaired experiment " or "independent samples"). For two selection t-test we test the null hypothesis: H0: $\mu 1 = \mu 2$.

In the end, we evaluated the results of the logical conclusions namely by the method of logical analysis, synthesis, deduction and induction.

RESULTS

On the development of endurance skills we used in the case of aerobic endurance continuous runs and on development of anaerobic endurance interval running means by the repetition method (Table 5). Speed capabilities we have developed 3 times a week. We trained mainly changes of the direction and acceleration maximum and frequency speed. Power capabilities, we developed through exercises in the gym with adding a weight, exercise with its own weight, bounces and throws by filled balls (3 kg - 5 kg). In terms of conditional readiness is essential period of condition training preparation and pre-competitive period. This takes place in the months of May, June and part of July, it has character of general condition training on land using a range of training methods and equipment.

Table 5 The volume of endurance, speed and strength abilities

Abilities	**Preparation period**			
	April	**May**	**June**	**Total**
Aerobic endurance in hours.	0,5	7,20	2,3	10
Running in km	3	55,5	17	75,5
Anaerobic endurance in hours.	0	1,5	5,5	7
Running in km	0	3	14,5	17,5
Speed capabilities in meters	0	2150	4300	6450
Acceleration rate in m	0	1220	390	1610
The speed with the changes of direction in m	100	530	1950	2580
Frequency speed in m	0	400	600	1000
Exercises with additional load (t)	0	90	70	160
Exercise with its own weights, (n)	30	4200	4800	9030
Reflecting exercises (n)	20	1500	1000	2520
Throwing exercises (n)	0	300	500	800
Sports games (min.)	60	450	300	810
Stretching (min.)	20	300	280	600

Source: own processing

In evaluating changes in speed capabilities, we used two general motor tests (running at 40 m with the changes of direction, agility test - Illinois).

Test results - run on 40 m

Comparing the results of input and output measurements, we found improvement because the median value decreased by 0,15 seconds. The best performance was improved by 0,06, the lowest by 0,23 s (Figure 1). In this test, showed worsening at one player and one player has reached the same input and output time. T test has confirmed the statistical significance level of p <0,01 (Table 6).

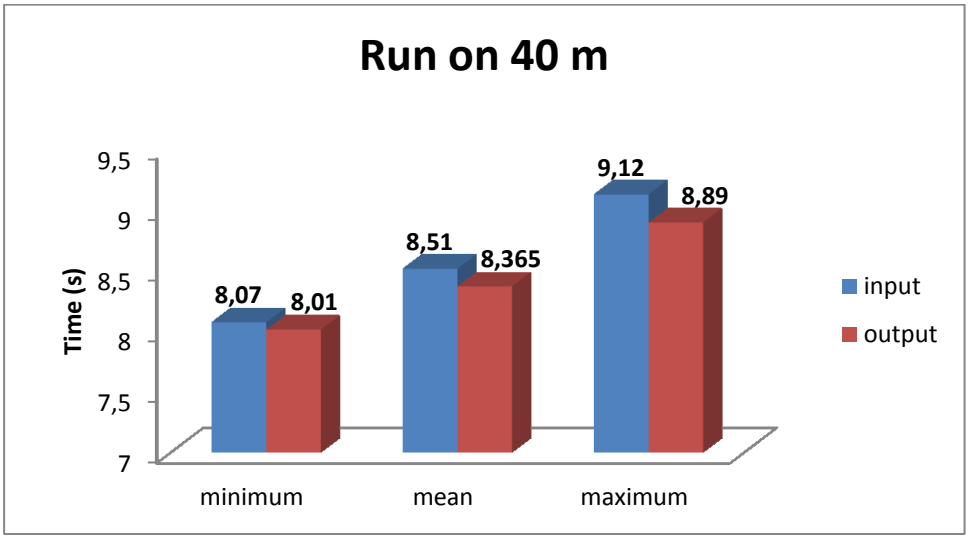

Figure 1 Changes in the level of speed skills in run on 40 m (Source: own processing)

Test results - agility - Illinois

Comparing the results of input and output measurements, we found improvement, whereas the median value fell by 0,025 s. For the best and worst performance we have seen an improvement of 0,8 s (Figure 2). In this test, showed worsening at five players. T- test has confirmed the statistical significance level of p <0,05 (Table 6).

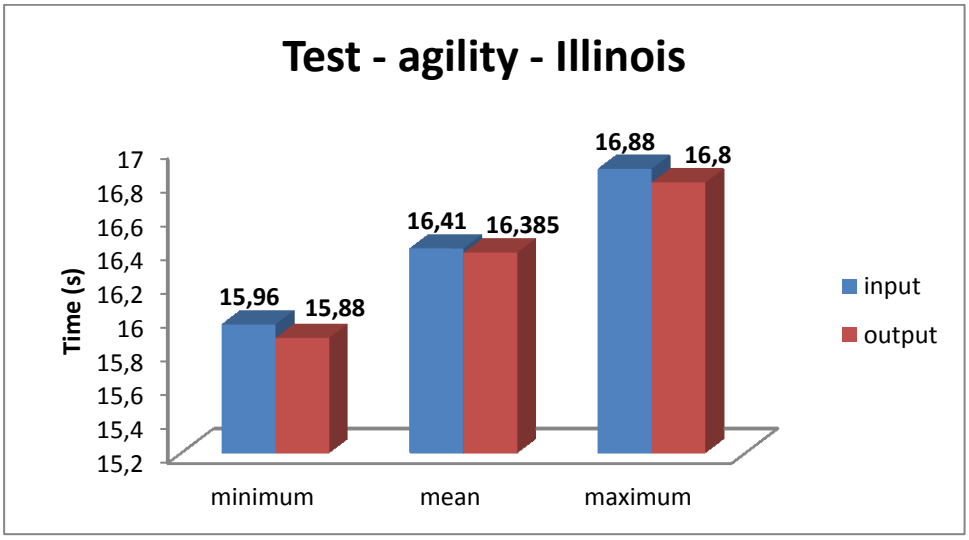

Figure 2 Change in level of speed abilities in agility test – Illinois (Source: own processing)

Table 6 General motor tests – evaluation – first part

n=20	run 40 m with changes of direction in seconds		long jump on one leg of the place in meters				agility test - Illinois in seconds	
	Input	Output	Input LL	Output LL	Input RL	Output RL	Input	Output
Arithmetic. avg.	8,51	8,37	7,85	7,91	7,88	8,00	16,44	16,32
The standard deviation	0,29	0,23	0,52	0,52	0,54	0,52	0,52	0,52
Median	8,51	8,365	8,05	8,1	8,025	8,1	16,41	16,385
Min	8,07	8,01	6,8	6,95	6,8	7	15,96	15,88
Max	9,12	8,89	8,55	8,5	8,6	8,65	16,88	16,8
Variation margin	1,75	0,88	1,75	1,55	1,8	1,65	0,92	0,92
t-test	0,0061		0,0199		0,000004		0,0105	
Significance	**p < 0,01**		**p < 0,05**		**p < 0,01**		**p < 0,05**	

Source: own processing

For the purposes of testing explosive strength of lower limbs, we used general motor test - long jump on one foot from space.

Test results - long jump on one leg from the place

Comparing the results of input and output measurements was recorded improvement in the case of the left leg, because the median value was increased by 0,05 m. In the case of the right foot, the median increased by 0,075 meters, so there was also improvement (Figure 3). In the long jump at the left leg three players worsened and on the right leg 1 player. T test has confirmed the level of statistical significance for the left foot $p < 0,05$ in the case of the right foot $p < 0,01$ (Table 6).

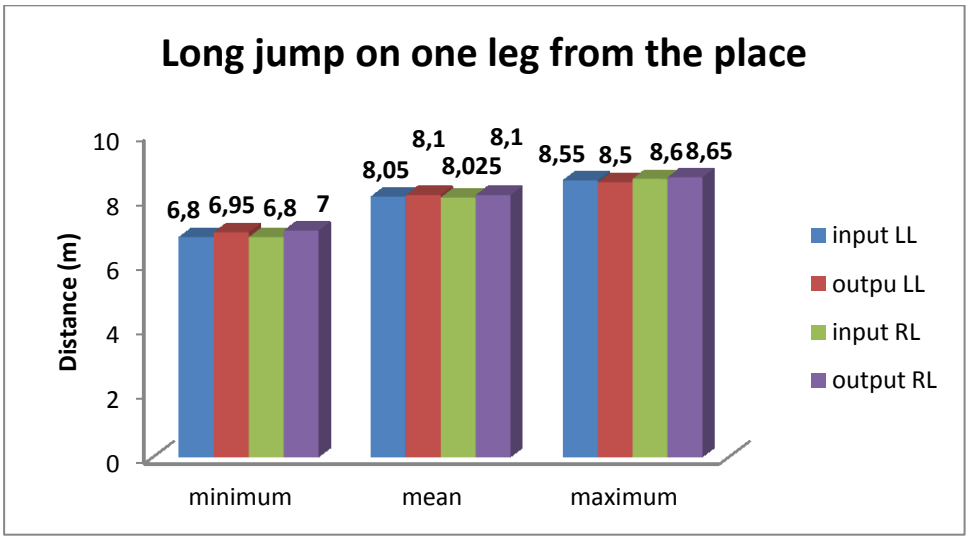

Figure 3 Change in level of explosive strength of lower limbs in the long jump on one leg of the place (Source: own processing)

Test results - sit – lie down

Comparing the results of input and output measurements we recorded improvement because the median value increased by 3,5 repetition (Figure 4). One player recorded a worsening of one repetition. T test has confirmed the statistical significance level of p <0,01 (Table 7).

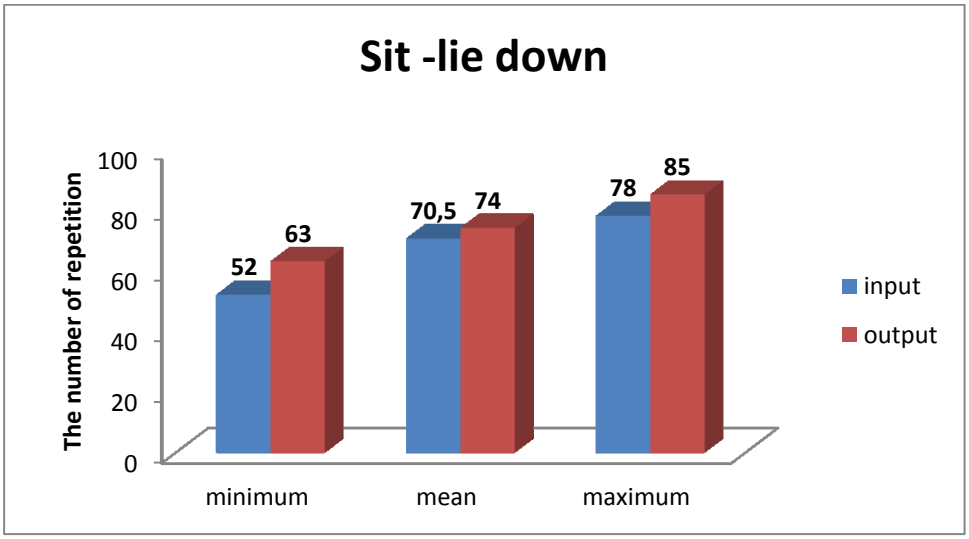

Figure 4 Changes in the level of dynamic forces – sit-lie down (Source: own processing)

In evaluating the changes in upper limb strength, we used general motor test - pressure weights lying on a bench with 70% of its own weight.

Test results - pressure weights lying on a bench with 70% of its own weight.

Comparing the results of input and output measurements we recorded improvement because the median value increased by 2,5 repetition (Figure 5). One player has worsened by one repetition, one reached the same number of repetitions of the input and output tests, other players have improved. T test has confirmed the statistical significance level of p <0,01 (Table 7).

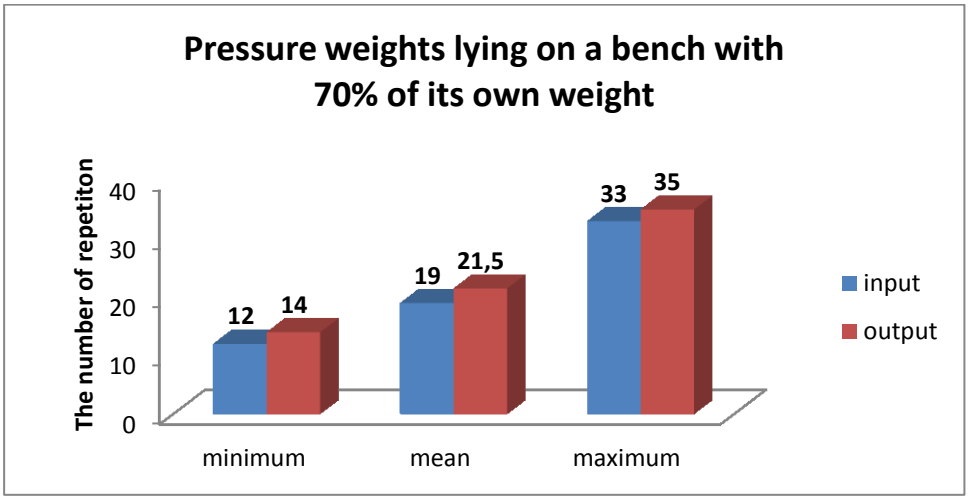

Figure 5 Changes in the level of upper limb strength-pressure weights lying on a bench with 70% of its own weight (Source: own processing)

In evaluating the changes in aerobic endurance, we used general motor test - endurance running boats run beep test.

Test results – endurance boats run beep test

Comparing the results of input and output measurements we recorded improvement because median value has increased by 2 sections (40) (Figure 6).

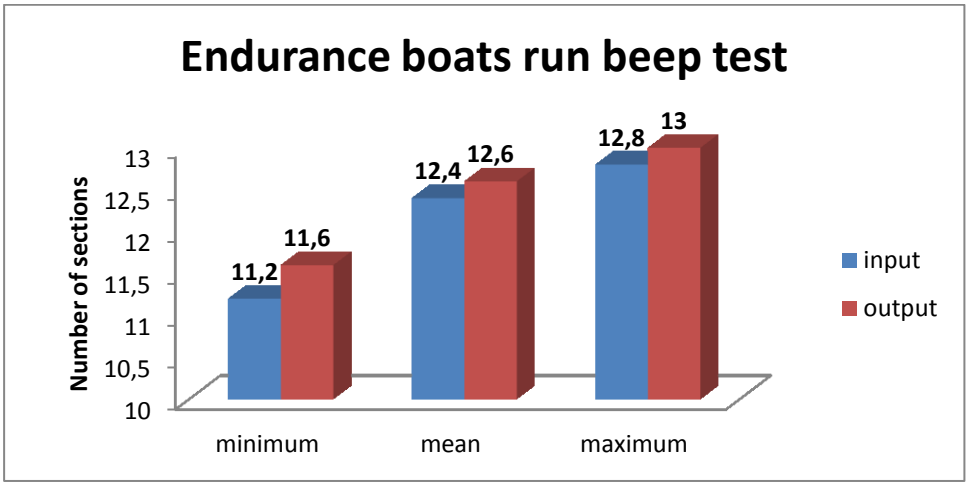

Figure 6 Changes in the level of aerobic endurance - endurance the shuttle run beep test (Source: own processing)

In all players, except one, we recorded improvement. One player reached the same input and output value 12 level and 8 sections. T test has confirmed the statistical significance level of p <0,01(Table 7)

Table 7 General motor tests – evaluation – second part

n=20	sit – lie down number of		pressure of weights lying on a bench with 70% of its own weight		endurance the boats run beep test	
	Input	Output	Input	Output	Input	Output
Arithmetic. avg.	69,15	74,3	19,5	21,4	12,26	12,52
The standard deviation	6,41	6,04	4,54	4,90	0,48	0,40
Median	70,5	74	19	21,5	12,4	12,6
Min	52	63	12	14	11,2	11,6
Max	78	85	33	35	12,8	13
Variation margin	26	22	21	21	1,6	1,4
t-test	0,0000005		0,00003		0,0000001	
Significance	**p < 0,01**		**p < 0,01**		**p < 0,01**	

Source: own processing

CONCLUSION

Based on these results we can conclude that implemented deliberate fitness program, which we realized during the preparation period had a significant impact on positive changes in all our study of fitness abilities. T – test recorded us for the long jump on one leg of the place and agility test - Illinois statistical significance level of p <0,05 in the case of other tests p <0,01, which is statistically significant dependence. Those changes that we recorded in each test can be regarded as evidence of the effectiveness of the training program implemented by us.

It should be noted the fact that the conditioning program caused by different players adaptive response. To eliminate this factor should be implemented individually or. group forms of training.

Fitness abilities are just one of the factors involved in the game performance of individual and teams is therefore necessary that we in the training load also focused on developing other skills.

It is also important to point out that summer hockey training should not be limited to 9-week training mesocycle. Should continue in adapted form over the next weeks in order to maintain the acquired level of fitness abilities.

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VPLYV KONDIČNÉHO PROGRAMU NA VYBRANÉ POHYBOVÉ SCHOPNOSTI HOKEJISTOV JUNIORSKÉHO DRUŽSTVA V PRÍPRAVNOM OBDOBÍ

SÚHRN

Predložený príspevok zaznamenáva a vyhodnocuje tréningové zaťaženie zameraným kondičným programom družstva juniorov HC 05 v sezóne 2013/2014 v 9 týždňovom mezocykle. Cieľom príspevku je overiť vplyv zámerného kondičného programu na vybrané pohybové schopnosti porovnaním zaznamenaných hodnôt vstupných a výstupných všeobecných motorických testov. Vyhodnotením testov sme dospeli k záveru, že nami realizovaný kondičný program mal vplyv na vybrané pohybové schopnosti. Vo všetkých testoch sme zaznamenali zlepšenie a štatisticky významnú závislosť.

KĽÚČOVÉ SLOVÁ: tréningové zaťaženie, zámerný kondičný program, vplyv, ľadový hokej, všeobecné motorické testy.

RESPONSE OF BIATHLETES ORGANISM TO LOAD IN FOUR CONSECUTIVE ANNUAL TRAINING CYCLES

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SUMMARY

Aim of this paper was to show correlation between analysis of changes in selected spiroergometric parameters levels in four consecutive training cycles, and reached skiing preformance in World Cup biathlon sprint contest. Key parameters were maximum oxygen uptake (VO_2max), maximum heart rate at AT (heart rate max) during preparation periods in training cycles and their relation to ski performance at World Cup Biathlon Sprint contest. M.K.'s difference of lowest heart rate percentage at AT from maximum HR recorded by us and highest heart rate percentage at AT from maximum HR is as much as 5,79%. It came to incease in AT ratio from maximum heart rate from 89,9% to 95,68%. M.M.'s difference (Table 3) between lowest heart rate percentage at AT from maximum HR and highest heart rate percentage at AT from maximum HR is 5,4%. It came to incease in AT ratio from maximum heart rate from 90,16% to 95,56%. On the basis of data shown we state, that heart rate percentage at AT from maximum HR correlated with changes in VO_2max values (Figure 3, 4). Better ski performance achieved M.K., what is apparent also from spiroergometric examination, in which his VO_2max maximum values are on very good level (Table 3). Although M.M.´s values in observed parameters improved annualy, his distance to top biathletes was always greater than in case of M.K. His VO_2max values are lower compared to M.K., and steadiness of his performance fluctuates, as shown in laboratory exams. This unsteadiness was visible at World Cup too, where in Pokljuka he was able to ski on same level with the best and place 6th in total score. A week after, his ski-time was one minute slower and he placed significantly worse.

KEY WORDS: biathlon, spiroergometric examination, maximum oxygen uptake.

INTRODUCTION

Biathlon is a Winter Olympic sport, in which slovak biathletes successfuly represent their country at an international level. Winter Olympic Games, World Championship and other major international events results are proof of it. Substantial part of this specific sporting discipline is level of competitors condition. Biathlon is a combination of intense physical load of skiing and precision (high sensory-motor coordination) needed at shooting.

Typical for biathlon is interruption of skiing load after 1,5km up to 4km leg for completing shooting round, which is executed in prone position or standing (Matiaško, 2013**).** Successful biathlete has to master endurance training, practice of fast paced cross-country skiing, cross-country skiing technique and he has to have well developed reflexes in small muscles of the hand as well as the organ of sight (Paugschová, 2000; Paugschová and Ondráček, 2007). Substantialy different character as rifle shooting has free technique cross-country skiing. Sport performance is in biathlon affected also by enviromental factors. According to Suchomel (2006) enviromental factors are sum of exogenous factors, which formate an individual during his ontogenetic development. Major part of phenotypic variance in traits of his motion ability indicators is determined by activity of factors, which are included in term enviromental factors. Exogenous influences of enviromental factors are according to Měkota (2005) considered to be so called modificators. Biological rhythms have been examinated from different perspectives by numerous authors, e.g. Halberg (1986, 2004), Jančoková (2000), Bendíková (2007), Švorc et al. (2008), Mojžiš (2011), Mojžiš & Pivovarniček (2011). Biological rhythms can be characterised by internal and external factors, thus they are divided into endogenous and exogenous. Pivovarniček examinated in several studies (2009a, 2009b, 2009c, 2010) influence of low frequency rhythms on motor abilities young soccer players. He found oscillations of running speed, explosive power of lower limbs and explosive power with spatial orientation within the week.

According to Komadel et. al (1985) spiroergometry is described as functional testing on a bicycle ergometer, or on a treadmill as it was in our case, with observation of changes in organism, particullary exchange of breathing gases, ventilation, blood circulation and metabolism parameters. Spiroergometric examination allows for complex display of changes undergoing in examined organism while exactly defined load and recovery after. Treadmill is suitable option for examining maximal oxygen uptake, which is usually 8% to 15% higher than with bicycle ergometer. This method is used to obtain basic values for top athletes. These values are used for subsequent training load modifications. The most important physiological parameter of performance in biathlon is maximum oxygen uptake **(**VO_2 max**).** Maximum

oxygen uptake is the value of parameter characterizing the lung ability to transport oxygen from air into blood, ability of blood and erythrocytes to bind oxygen, ability of heart to pump blood, maximum minute volume, ability of blood circulatory system to transport blood to muscles and the ability of muscles to use oxygen. In endurance disciplines several authors (Komadel a kol,. 1985; Pupiš & Čillík, 2005; Korčok & Pupiš, 2006) state close correlation between competition placements and level of VO_2 max. According to Komadel et. al (1985) world-class athletes are able to uptake almost double the volume, up to 90 $ml.min^{-1}.kg^{-1}$. VO_2 max value varies linearly with maximum oxygen volume, which is the most important parameter of VO_2max. Changes during seasons are often in accordance with cycle of year (Jančoková, 2000; Štulajter, 2004). Aim of chronobiology is to examine optimal time periods and cycles for development of motor abilities and corresponding physiological and mental functions. They influence not only level of motor abilities or athletic performance, but also actual performance condition, which is determined also by exogenous factors (Jančoková, 2000). As general rule, maximum heart rate can not be increased by training. As a result the heart volume and stroke volume are much higher by top skiers than by untrained individuals and are responsible for increase in maximum minute volume and VO_2max acquired in training. Increase in stroke volume reflects in decrease of heart rate during submaximal load. For evaluation of load intensity, linear relationship between load intensity and heart rate applies (Štulajter & Brozmanová, 1990; Bunc 1996). That means, with increased movement activity, heart rate values will increase as well. In case intensity of movement activity increases up to maximum values, heart rate shows only small increase from values above ca. 90% maximum heart rate (Bunc, 2009). Reason for this effect is increased participation of anaerobic processes, also called saturation effect. If physical load is supposed to lead to specific adaptation changes conditioning improvement of functional fitness, it has to reach certain minimum (threshold) intensity (Hamar, 1989). According to Hamar (1997) heart rate less than 130 causes unsufficient changes in organism, heart rate between 130 and 150 beats per minute develops athlete‘s aerobic and anaerobic capacity and above 180 develops anaerobic capacity.

Load intensity at anaerobic threshold level is well characterised also by VO_2 max values at anaerobic threshold (AT). Untrained individuals have VO_2max at AT around 50%, by training can this increase up to 90%. Heart rate at AT is by young male adults between 170-180 beats per minute, or 85-90% of maximum. With training this rate is reached by higher intensity of muscle activity, e.g. faster pace skiing (Hamar, 1996). From practical point of view, advantage of anaerobic threshold is that in it’s parameters (oxygen uptake, percentage

of VO_2max) and especially in running speed, changes in endurance level occur more sensitive as in maximum oxygen uptake. Improvement is visible months, even years after active training, when, as a rule, VO_2max values stagnate.

Regular assesment of running speed at anaerobic threshold during active training can be in this case used as suitable criterium not just for current level evaluation of endurance prerequisites, but also for objectivity in effectiveness of completed training load. Moving lactate curve to the right and increasing threshold pace testifies positive effect of used training tools. Stagnation signals unsufficient adaptation of organism to loads. Reason for that can be unsuitable training (to low/high training volume, wrong training tools, to low/high intensity etc.) (Hamar, 1996).

This paper is part of the grant scientific project *VEGA 1/0757/12 Reactive and Adaptation Indicators of Changes in Motor and Mental Abilities of Sportsmen in Relation to Biorhythms of Different Lenghts.*

AIM

The aim of this paper is to determine response of organism to load in four consecutive annual training cycles (olympic cycle), based on level analysis of chosen parameters spiroergometric examinations (VO_2max, heart rate, AT) and contribute so to effectivenes increase of training process.

METHODOLOGY

Observed biathletes were two members of top sports center VŠC DUKLA Banská Bystrica. Biathletes are members of national male representative team, and participated also at Winter Olympics in 2006 and 2010, currently training for the 2014 Winter Olympics in Sochi (Table 1).

Table 1 Basic biathletes informations

Name	Date of birth	Weight (kg)	Height (cm)	Years in biathlon
M.M.	14. July 1982	70	182	15
M.K.	10. May 1983	74	187	15

M.K. was born on 10. May 1983. Biathlon has been part of his life since his childhood, as his father works as a trainer at club level. In young age he was combining cross-country skiing and biathlon, what was a good prerequisite for mastering ever harder training units. Mainly he was practising classic style, what allowed him to acquire cross-country skiing technique. M.K. has been actively pursuing biathlon for 15 years, when he transfered as junior from KB Predajná club to biathlon club at VŠC Dukla Banská Bystrica. In the course of three years M.K. was achieving great international results, in 2003 he became European Champion. His achievements as junior helped him to rank among senior representative team, where he presently holds leader‘s position. In this category he gradually specialised on winter biathlon and roller-ski biathlon. During the 2011-2012 season, he was member of slovak mixed relay team, that won for Slovakia first bronze medal.

M.M. was born on 14. July 1982, biathlon has been part of his life since his childhood, when he cross-country skied as a member of skiing club Nováky. In this time he acquired sense for skis, especially kick, as well as sense for standing on skis and coordination. In junior category M.M. was achieving medal positions, at Summer Biathlon World Junior Championship he won the Gold medal. In winter 2002 he was second in junior category. In senior category he joined national representative team, where he is a valid member. In 2007 he underwent elbow surgery and that year wasn‘t nominated for World Championship. After recovery he rejoined the team. For the last two years he has been part of regular male relay team as well as mixed relay (2 men, 2 women), that have attacked best positions several times. In Kontiolahti, Finnland during annual training cycle (ATC) 2011/2012 relay team placed in World Championship at great third place. Comparing to top world biathletes, his skiing performance is lower, also in comparison to M.K., instead his shooting part is more stable, and therefore he has higher expectations for a good result in competitions with four shootings, where he can his ski deficit compensate with better shooting.

Biathletes took part at diagnostics in the course of four consecutive ATC in the months July to October under the supervision of MUDr. V.V., in ATC 2009/20010, 2010/2011, 2011/2012 a 2012/2013. Exact testing dates follow in Table 2**.** Used method was ex post facto. Spiroergometric examination results were obtained from PaedDr. P.K., PhD. - trainer of Slovak men‘s national biathlon team. Spiroergometric examination took place in a laboratory setting/conditions of VŠC Dukla Banská Bystrica. At each examination same methodics of maximum incremental loads was used. Eight minutes warm-up at velocity 10km/h and 5 degree incline was followed by two minute break. Afterwards actual examination started. During actual examination initial velocity of 10 km/h and 5 degree incline were used.

Subsequently during entire examination with each started minute velocity was increased by 1 km/h every minute up to the 17th minute (incl. warm-up) with unchanged elevation of 5 degrees. After the 17th minute, velocity wasn't increased any further, now treadmill incline was increased by 1 degree after every finished minute. Examination was terminated when subject stepped out of treadmill while reaching his subjective judgment of maximum load. Spiroergometric parameters from this examination were evaluated in gas analyzer brand JEAGER. Key parameters for analysis were VO_2max, heart rate, AT. As supplemental indicator of response to load we used biathletesn deprivation times in skiing part at biathlon World Cup sprint (Table 4).

For processing the data we used quantitative and qualitative methods of evaluation. We summarized results in Tables and Figures and for interpretation we used basic logic methods (analysis, synthesis, induction, deduction, comparison).

RESULTS

For both biathletes we recorded continual increase in maximum oxygen uptake VO_2max during entire observation time. In maximum heart rate we observed only minimal changes. For M.K. we recorded highest value (79,9 mmol/kg^{-1}) during entire time of observation in last ATC. M.K.'s lowest maximum heart rate, we recorded in autumn in ATC 2010/2011 (max HR 184). Highest maximum heart rate we recorded was 188 bpm, hereof three times in finishing measurement for given ATC. Lowest HR value at AT we recorded for M.K. was 169 bpm. Interesting fact is, that this value was recorded at the beginning of obsevation time and thereafter grew continually to the value of 177 bpm (Table 2).

Table 2 M.K.'s spiroergometric examination values

Examination date	Height (cm)	Weight (kg)	W170/kg	VO_2max	VO_2/kg	HR max	AT	%
29.6.2009	187	73,5	5,03	5376	73,1	186	169	90,86
11.11.2009	187	73,7	5,22	5440	73,8	188	169	89,89
15.7.2010	187	74,4	5,86	5533	74,4	184	174	94,57
6.10.2010	187	76	5,52	5485	71,8	184	173	94,02
1.6.2011	187	77,7	5,5	5878	75,6	188	176	93,62
4.11.2011	187	76,9	5,62	5923	77	188	176	93,62
5.7.2012	187	76,9	5,46	6143	79,9	185	177	**95,68**
30.10.2012	187	74,6	4,96	5606	75,2	188	175	93,09

Biathelete M.M. reached maximum VO_2max value congruently in last ATC (75,7 mmol/kg^{-1}) (Table 3). Lowest value of maximum HR was measured for M.M. during ATC 2011/2012 (182 bpm). Highest value of maximum HR was recorded at a value of 188 bpm in first and second ATC. M.M.'s values of heart rate at AT were fluctuating significantly. Lowest heart rate at AT was recorded in first ATC (165 bpm), thereafter it increased in following ATC. On 1.7.2011 there was again recorded M.M.'s HR decrease at AT with 167bpm. We suppose, it was caused by preference of different training tools (bicycle), because of achilles tendon injury. This type of training didn't lead to musculoskeletal system local adaptation to the load of spiroergometric examination. Consequently, biathlete experienced during examination agitation from different load, especially at peak performance.

Table 3 M.M.'s spiroergometric examination values

Examination date	**Height (cm)**	**Weight (kg)**	**W170/kg**	**VO_2max**	**VO_2/kg**	**HR max**	**AT**	**%**
16.6.2009	182	71,2	4,98	4902	68,8	188	173	92,02
11.11.2009	182	71,8	5,47	5094	70,9	183	165	90,16
15.7.2010	181	72,6	5,15	5027	69,2	183	169	92,35
6.10.2010	182	70,8	5,47	4693	66,9	188	174	92,55
1.7.2011	182	71,3	6,1	5057	70,9	182	167	91,76
4.11.2011	182	68,2	4,99	5188	75,5	185	170	91,89
5.7.2012	182	70,9	5,47	5343	75,7	180	172	**95,56**
30.10.2012	182	71,7	4,98	5181	72,3	186	172	92,47

For endurance training purposes very important information is also heart rate value at AT. This value describes training load intensity, at which mechanisms of energy production in aerobic conditions are stimulated in a large extend. HR value at AT we measured describes upper limit of aerobic endurance training load intensity. As seen on Figures 1 and 2, we state, that with changing maximum oxygen uptake values, also values of maximum heart rate and heart rate at AT changed. As described in literature, this indicator showed in case of both biathletes different percentage values of HR at AT from maximum heart rate.

M.K.'s (Figure 1) lowest difference between maximum heart rate and HR at AT was recorded during last ATC (finishing examination), beeing 8 bpm, what presents the HR value

at AT at 95,7% from maximum heart rate. During this examination we also recorded highest VO_2max value: 79,9 mmol/kg kg^{-1}.

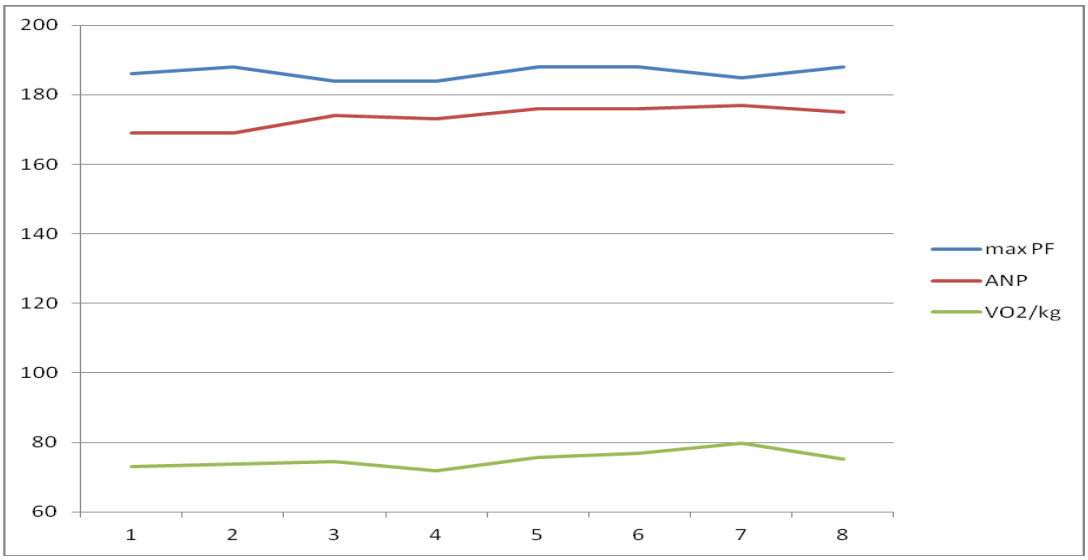

Figure 1 Graphic presentation of selected M.K.'s spiroergometric indicators

M.M.'s (Figure 2) lowest difference between maximum heart rate and HR at AT was recorded also during last ATC (finishing examination), beeing 8 bpm, what presents the HR value at AT at 95,6% from maximum heart rate. During this examination, his second best VO_2max result (75,5 mmol/kg^{-1}) was recorded. Although the highest VO_2max value recorded wasn't for this biathlete we suppose, that recorded percentage of HR at AT from maximum HR indicates distinct improvement of aerobic mechanism involvement within peak performance.

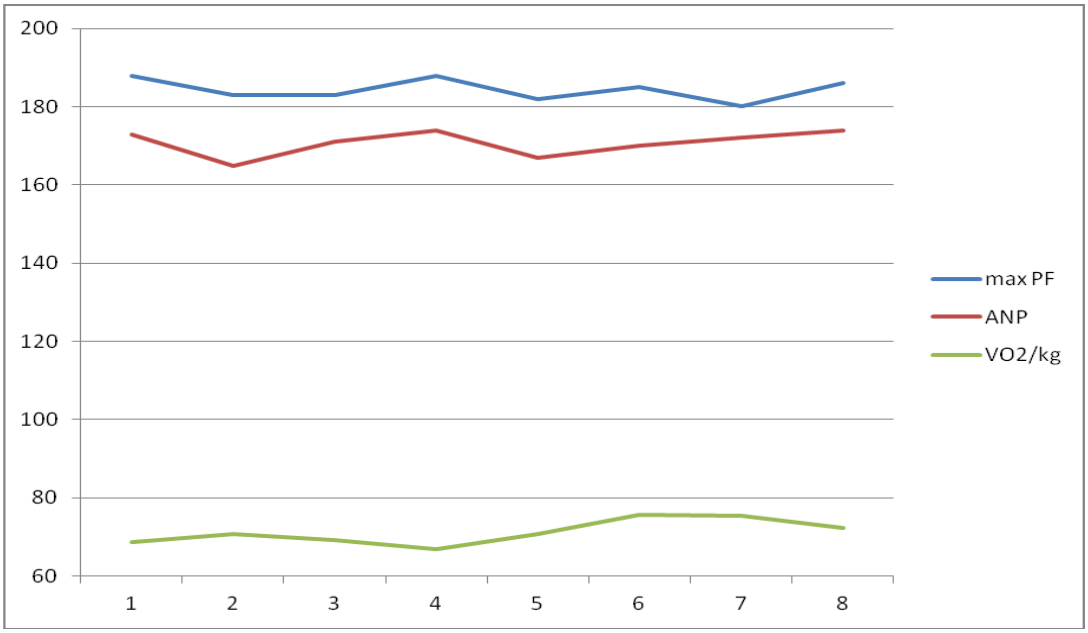

Figure 2 Graphic presentation of selected M.M.'s spiroergometric indicators

We agree with propositions of other authors, that in endurance sporting disciplines, during the period of peak athletic preparation of top athletes, there are only minimum changes in heart rate and VO_2max values, however there are distinct changes in percentage of HR at AT from maximum HR during particular preparation period. As seen in Table 3, the difference of lowest heart rate percentage at AT from maximum HR recorded by us and highest heart rate percentage at AT from maximum HR is in case of M.K. as much as 5,79%. It came to incease in AT ratio from maximum heart rate from 89,9% to 95,68%.

In case of M.M. (Table 3), the difference of lowest heart rate percentage at AT from maximum HR and highest heart rate percentage at AT from maximum HR is 5,4%. It came to incease in AT ratio from maximum heart rate from 90,16% to 95,56%.

On the basis of data shown we state, that heart rate percentage at AT from maximum HR correlated with VO_2max values changes (Figure 3, 4).

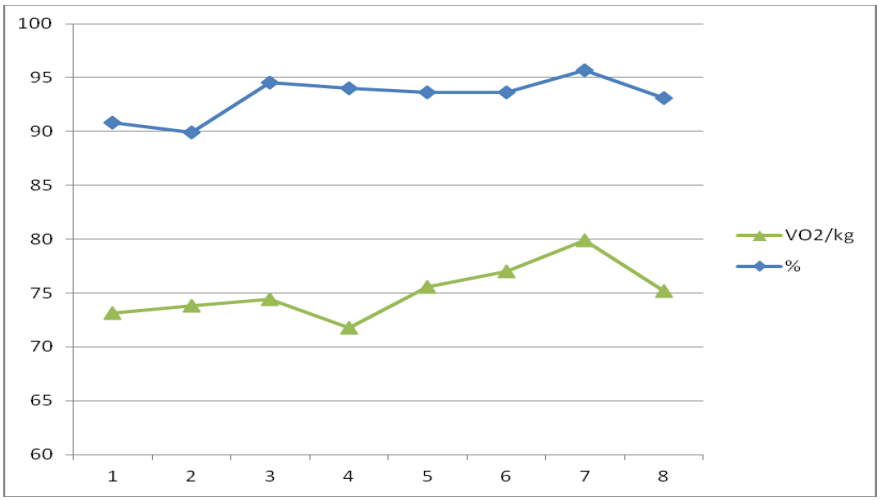

Figure 3 Graphic display of VO_2max and AT % to maximum heart rate (M.K.)

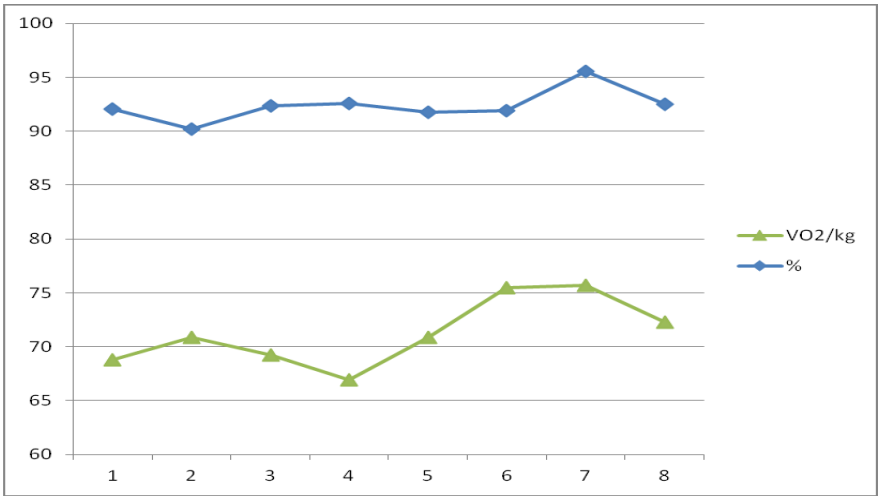

Figure 4 Graphic display of VO_2max and AT % to maximum heart rate (M.M.)

Spiroergometric examination results recorded by us show annual improvement of endurance performance parameters. Although in a complex evaluation of athletic performance, solitary spiroergometric examination values aren't sufficient, it's a summary of numerous components taking part in athletic performance. As seen in Table 2 and Table 3, VO_2max values and their annual improvement recorded by us, were apparent in biathletes improvement in sprint biathlon ski performance. Deprivation to the top world biathletes reduced gradually (Table 4). Better ski performance achieved M.K., what is apparent also from spiroergometric examination, in which his VO_2max maximum values are on very good level (Table 2). Although M.M.´s values in observed parameters improved annualy, his distance to top biathletes was always greater than in case of M.K. His VO_2max values compared to M.K. are lower, and steadiness of his performance fluctuates, as shown in laboratory exams. This unsteadiness was visible at World Cup too, where in Pokljuka he was able to ski on level with the best and place 6th in total score. A week after, his ski-time was one minute slower and he placed significantly worse.

Table 4 Biathletes average time losses (min and sec) in individual ATC

	M.K.	**M.M.**
2009/2010	01:46	02:23
2010/2011	01:07	02:24
2011/2012	00:57	01:52
2012/2013	00:45	01:37

CONCLUSION

We found, that during four year training cycle, biathletes ski performance fluctuated in close connection with numerical value of heart rate percentage at AT from maximum HR. Further we discovered, that the closer the AT value to the maximum heart rate, the better is biathletes ski performance and subsequently deprivation to world top biathletes reduces. Biathletes ski performance increased gradually, and particulary the difference between anaerobic treshold and maximum heart rate decreased. Fact is, that best results were achieved in summer, and therefore we would recommend change or adjustment in trainig, where it would come to shift or delay of top shape to October, just before leaving for the first snow (closing preparation). At the same time, we suppose, that this shift could lead to better ski performance during winter time. We are aware of the fact, that the reason could have been,

that the absolute maximum is in endurance sporting disciplines shifted to September, evtl. October. From training process perspective it´s necessary to improve athletic performance components which ensure endurance, however major redesign is out of consideration, in view of rhythmicity retention of load stimuli (Kokinda, 2010).

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ODOZVA ORGANIZMU NA ZAŤAŽENIE BIATLONISTOV V ŠTYROCH PO SEBE NASLEDUJÚCICH TRÉNINGOVÝCH CYKLOCH

SÚHRN

Cieľom našej práce bolo prostredníctvom analýzy zmien úrovne vybraných hodnôt spiroergometrických vyšetrení počas štyroch po sebe nasledujúcich ročných tréningových cyklov, poukázať na ich koreláciu s dosiahnutou bežeckou výkonnosťou v pretekoch svetového pohára v biatlone v pretekoch v rýchlostnom biatlone. Kľúčovými parametrami spiroergometrických vyšetrení pre splnenie cieľa boli maximálna spotreba kyslíka (VO_2max), maximálna srdcová frekvencia pri ANP (max SF) v prípravných obdobiach štyroch ročných tréningových cyklov a ich vzťah k bežeckej výkonnosti v pretekoch svetového pohára v biatlone v rýchlostnom biatlone. M.K. zaznamenal rozdiel medzi nami zaznamenaného najnižšieho percentuálneho vyjadrenia srdcovej frekvencie pri ANP z maximálnej SF oproti najvyššiemu percentuálnemu vyjadrenia srdcovej frekvecie pri ANP z maximálnej SF až 5,79%. Z hodnoty 89,9% došlo k zvýšeniu zastúpenia ANP z maximálnej srdcovej frekvencie na 95,68%. M.M. (Tabuľka 3) zaznamenal rozdiel medzi najnižšou hodnotou percentuálneho vyjadrenia srdcovej frekvencie pri ANP z maximálnej SF oproti najvyššiemu vyjadreniu SF pri ANP z maximálnej srdcovej frekvencie o 5,4%. Z hodnoty 90,16% došlo k zvýšeniu zastúpenia ANP z maximálnej srdcovej frekvencie na 95,56%. Na základe uvedeného konštatujeme, že percentuálne vyjadrenie srdcovej frekvencie pri ANP z maximálnej SF vhodne korelovalo so zmenami hodnôt VO_2max (Obrázok 3, 4). Lepšiu bežeckú výkonnosť dosahoval M.K., u ktorého je to vidieť aj pri spiroergometrických vyšetreniach, kde jeho maximálne hodnoty VO_2max sú na veľmi dobrých úrovni (Tabuľka 3). M.M. sa síce každoročne v sledovaných parametroch zlepšoval, ale jeho odstup od najlepších biatlonistov bol stále väčší ako než u M.K. Jeho hodnoty VO_2max oproti M.K. sú nižšie, jeho stabilita

výkonnosti je kolísajúca tak, ako to dokazujú aj laboratórne vyšetrenia. Táto kolísavosť sa odzrkadlila aj v pretekoch svetového pohára, kedy bol v Pokljuke schopný bežať na úrovni najlepších a obsadil 6. miesto v konečnom poradí, ale o týždeň neskôr došlo k spomaleniu behu o jednu minútu a zaznamenal prepad vo výsledkovej listine

KĽÚČOVÉ SLOVÁ: biatlon, spiroergometrické vyšetrenie, maximálna spotreba kyslíka.

PREFERENCES OF PHYSICAL ACTIVITIES OF YOUNG AGE CHILDREN IN THE CZECH REPUBLIC

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SUMMARY

The aim of the survey was to describe and analyse the preferences in children's interest at young age, focusing on physical activities. Children's interests in facultative forms of physical education offered by primary schools (clubs) was made in the form of a survey. This survey was based on a modified version of the standardised questionnaire in order to find the interests of primary school pupils (Fromel, 1991, 1994). The surveyed sample was composed of 10711 children aged 6-12 (out of which 5350 were boys and 5361 were girls) from primary schools in the Czech Republic in the Olomouc Region. All grades of primary school were included in the sample. In total, 39% of children from the surveyed sample attend clubs focusing on physical activities. The results were processed by the method of incidence of answers, in percentage and graphically. Children in the surveyed sample prefer sports games, physical games, floorball, and clubs focused on movement with music (dancing clubs, aerobic). 42% of surveyed children prefer clubs which are not focused on physical activities. Almost one fifth of the surveyed sample (19%) does not take advantage of the offer of the primary schools to participate in free-time activities. That is why it is necessary to focus on this group of children and motivate them to active passing of their free time.

KEY WORDS: physical activity, interests, children, young age, primary school.

INTRODUCTION

Recent researches in the Czech Republic point out to the increase in the proportion of obese boys by 2.6% and by 1.7% in the case of girls, especially at the age between 7 and 11. Tláskal (2006) states that children who are obese at the beginning of their lives (up to the age of 6) are less often obese in their adulthood (26%) than is the case of children who are obese after the age of six. The obesity of seven-year-old children lasts till the age of 36-47 in the case of approximately 51% of adults. In a similar research the obesity of 9-18-year-old

children lasted till the age of 23-33 in 48-75% of researched cases. If the obesity is not dealt with in the childhood it is supposed that eight out of ten children will remain obese in their adulthood. Based on the results of the research by Kunešová (2006) and Cabrnochová (2008) it was found out that there are approximately 20% of 6-12-year-old children in the Czech Republic who are overweight, out of whom 10.3% are obese. The highest percentage of obese children (18%) was found between seven-year-old children and it can be assumed that there is a relationship between the change of physical activity regime after the beginnig of compulsory school attendance. In order to lower the occurrence of obesity of children between the age of 8 and 16, Kučera and Golebiowska (1994) recommend the involvement of the whole organism in the physical activity, focusing on the circulatory, respiratory and locomotive system, while creating a positive attitude of the child to the physical exercise. According to them, the creation of positive attitude of the obese individual to the physical activity and understanding of the function corresponding to the daily regime is more important than immediate fast loss of weight. But the *Výživa* consulting centre (2008) states on the basis of the results of a questionnaire survey (16,000 respondents) in the years 2006 and 2007, that 62% of children at primary school age in the Czech Republic do not do any physical activity in addition to the compulsory two lessons of physical education at schools (http://www.vyzivadeti.cz/pohyb/sportovni-aktivity-podle-veku/#skolaci).

Participation of a child in the sports activities in the sports organisations has positive impact on the development of their personality in the sense of independence and self-reliance, as well as in the field of creating social relations and bonds. Children who participate in sports activities are more self-confident, more adaptable, and they manage failure and stressful situations better than hypoactive children. Sports activity strengthens the will and develops self-control, self-confidence and rids the child of fear from the unknown (Perič, 2004; Vališová Kasíková, 2007). The impact on physical, intellectual and emotional aspects of the personality, as well as social development and mechanism of the creation of social relations has been proved (Fürstová, 1997; Belej, 2001; Vágnerová, 2005). Matějček - Dytrych (1994) mention the importance of some physical skills, e.g. swimming, skiing, or riding, which help clumsy children to get self-confidence and integrate into the children's collective. According to Dvořáková (2006), movement is linked to the whole personality of the child; it makes its integral part and is a means to fulfil other needs. It is one of the most important determinants of the future ability to learn new skills and knowledge.

It is generally recommended that the share of physical activities in their daily regime be approximately 25% in the case of children aged 4-6, 20.8% in the case of children aged 7-11,

16.6% in the case of children aged 12-14, and 12.5% in the case of adolescents aged 15-18 (http://www.vyzivadeti.cz/pohyb/ sportovni-aktivity-podle-veku/#skolaci). In all the cases, 50% of the above stated Figures are the essential minimum for the life of the child. The extent of physical activities of children in hours per day is as follows: 6 hours in the case of children aged 4-6, 5 hours in the case of children aged 7-11, 4 hours in the case of children aged 12-14, and 3 hours in the case of adolescents aged 15-18 (http://www.vyzivadeti.cz/ pohyb/sportovni-aktivity-podle-veku/#skolaci). The intensity of physical load is also discussed by Haskell and al. (2007). He suggests executing physical activities 5 times a week with 60-74% maximum heart freqeuency and 3times a week 20 min of physical activities with a high level of load intensity.

Contemporary conception of the didactic process in the field of acquiring physical skills, raising the level of physical skills, and acquiring knowledge in the field of education for health is being built on new principles in the Czech Republic when the pupil is put in the focus in the process of didactic interaction. The starting point of the pedagogues' effort at schools should be the use of the knowledge of the so-called teaching with understanding or teaching of problem solving (Adamus & Tomajko, 1994; Karger, 1996; Tomajko & Adamus, 1995; Tomajko, 1996; Velenský, 1997; Dietrich, Dürrwächter & Schaller, 1994). A serious didactic problem is how to secure an adequate physical education of pupils, physical condition, physical skills capacity, and sports interest on the one hand, and creativity, enjoying the experience, freedom of decision-making, and other features of contemporary conception of education on the other hand.

AIM

The aim of the survey was to describe and analyse the preferences of physical activities of young age children in the Czech Republic.

METHODOLOGY

The sample consisted of 10711 probands (5350 boys; 5361 girls) aged 6-12 from 70 elementary schools in the Czech Republic. The probands attended the 1st - 5th grades of the primary schools in the Olomouc Region (Figure 1).

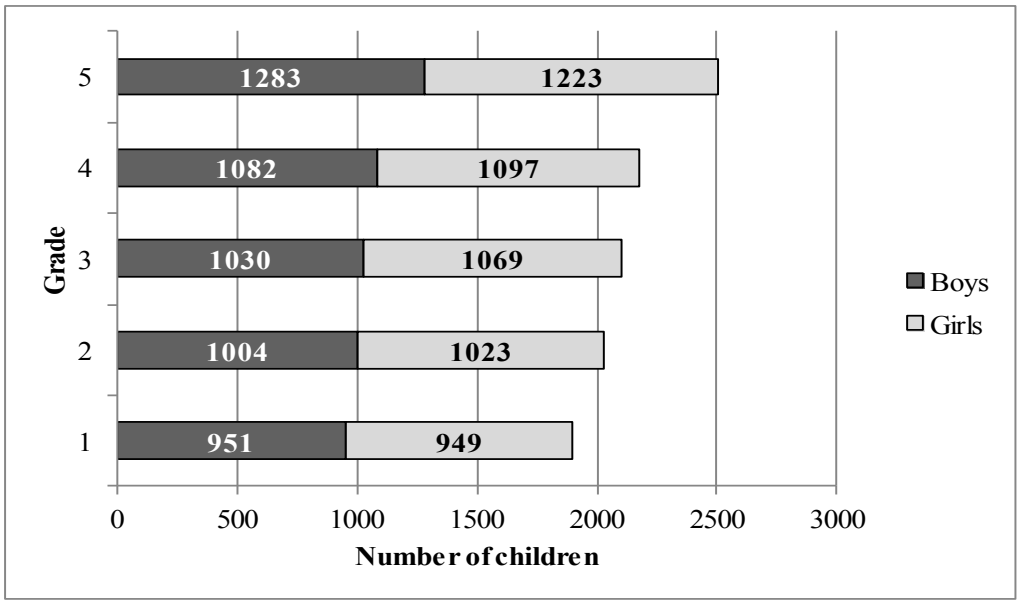

Figure 1 Number of children according to the grades of the primary school, n = 10711 (nB = 5350; nG = 5361)

Legend: 1 - 5... grade of compulsory school attendance; 0-3000... number of children in the grade

In view of the low age of the children, the condition of their participation in the survey was the approval from their legal representatives. The data collection was carried out by empirical investigation of a qualitative character. A modified version of a standardised questionnaire was used in the data collection in order to investigate pupils' interests in physical activities (Frömel, 1991, 1994) (Appendix 1). The modification consisted in the elimination of physical activities intended for older age groups, e.g. shot put, windsurfing, motor sport, biathlon etc. (Table 1). Another condition was the active participation of the surveyed child in this physical activity. The selection of elementary schools was premeditated; it was dependent on the approval of the children's parents, and of the management of the schools. Representativeness was not required. 39% city schools, 44% village schools, 11% small schools, 1% church schools, 1% sports schools and 4% special schools participated in the research. (Figure 2). An electronic form of distribution of questionnaires to the probands (their teachers) including 5 questions was used. The questions were based on the aim of the investigation. Obtained data were evaluated in percentage and graphically, and summarised in Tables and Figures.

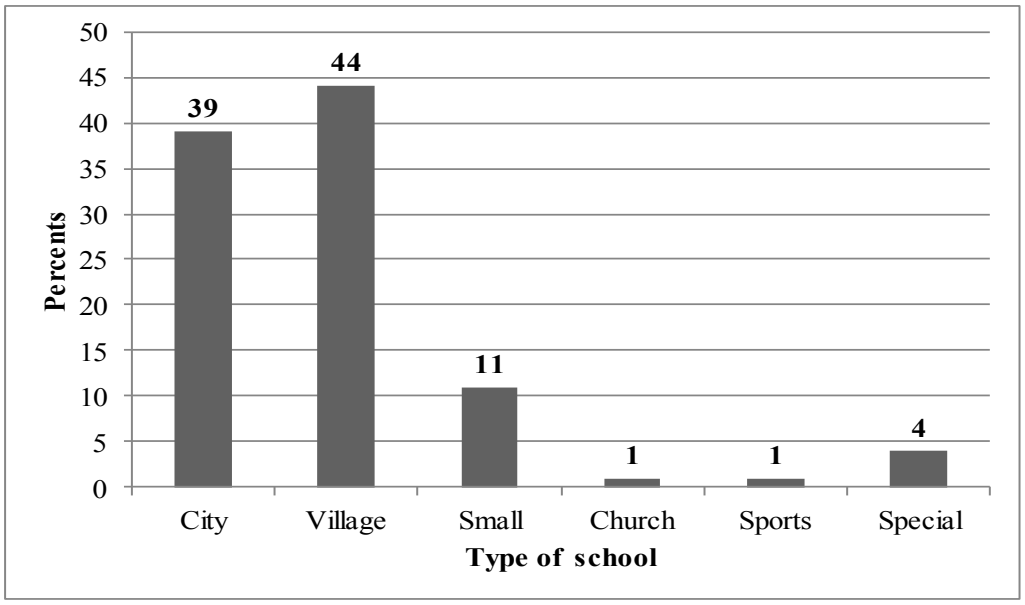

Figure 2 Types of participating schools; n = 70

RESULTS

At the beginning of the survey a short review of participating schools was carried out. Based on the results, it can be observed that the number of activities other than sports exceeds the number of sports clubs at the schools surveyed. The schools in the Olomouc Region offer 226 sports clubs and 413 clubs related to other activities (Figure 3). We found out that that the number of clubs related to other than sports activities is higher by 187 in the Olomouc Region. When expressed by percentage, it is obvious that the percentage of clubs related to other activities is higher than of clubs related to sports.

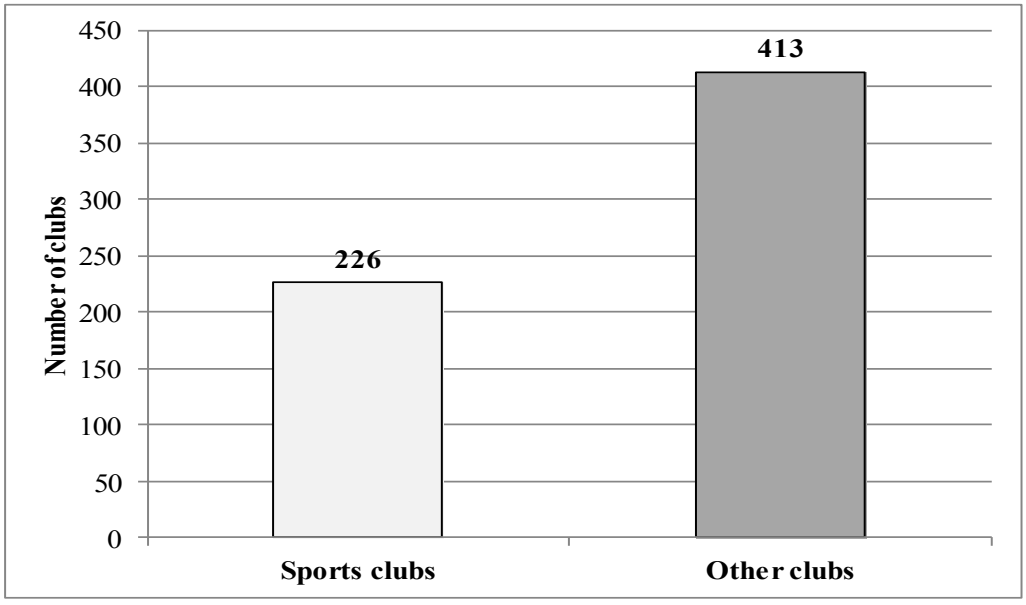

Figure 3 Incidence of clubs organised by the elementary school, n = 70

4141 children (i.e. 39% of the surveyed sample) actively participated in sports clubs. Other clubs (i.e. clubs not related to sports) were attended by 4547 children (42% of the surveyed sample). It is alarming that 2023 children (19% of the surveyed sample) are not interested at all in active spending of free time in any of the activities offered by a particular elementary school (Figure 4).

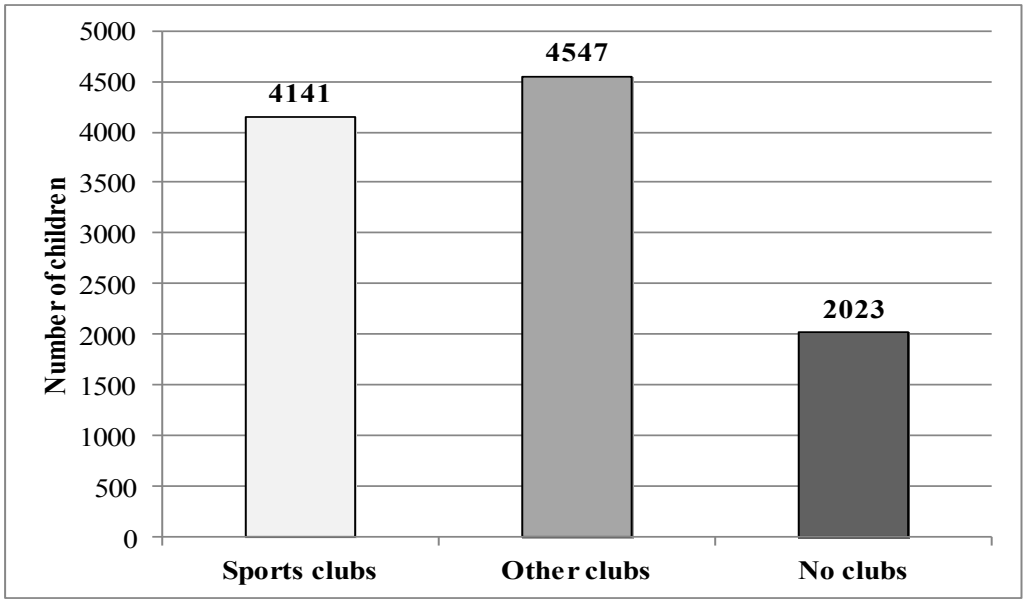

Figure 4 Incidence of participation of surveyed children in the clubs organised by the elementary school; n = 10711

Surveyed schools offer a wide spectrum of optional subjects - clubs, whose focus is influenced by space, material, and personal possibilities of the school, and by the interests of their pupils. Children's preference of individual sports or physical activities offered by the surveyed primary schools by way of optional physical education varies (Table 1). Most out of the 4141 children enrolled in the sports clubs at schools were interested in sports games. Clubs focusing on sports games, physical games, floorball, dancing clubs, aerobic and tourism are prefered the most.

Table 1 Active participation of girls and boys in optional physical education, n = 10711 (n B =5350 ;n G = 5361)

Focus of the clubs	**1st GRADE**		**2nd GRADE**		**3rd GRADE**		**4th GRADE**		**5th GRADE**		**Total**	**%**
	b	**g**	**b**	**g**	**b**	**g**	**b**	**g**	**b**	**g**		
sports games	70	66	100	79	100	105	134	126	167	191	1138	27.5

physical games	55	61	69	64	50	55	34	42	33	41	504	12.2
tourist activities	22	27	37	28	18	23	21	33	24	33	266	6.4
floorball			6	4	38	28	66	46	87	60	335	8.1
dance	12	39	25	44	20	56	17	56	15	51	335	8.1
volleyball									85	95	180	4.3
ball games	8	9	8	9	2	2					38	0.9
five-a-side football	3		7		6		11		10		37	0.9
fencing									5	3	8	0.2
ice skating											0	0
majorette		9		10		11		11		14	55	1.3
karate									10	6	16	0.4
BMX									1		1	0.02
table tennis			5	3	13	17	19	18	18	14	107	2.6
football	21		19		31		25		33		129	3.1
exercise of parents with children	6	8	2	1	2	1					20	0.5
aerobic		43		43		65		72		83	306	7.4
basketball							5	6	70	93	174	4.2
frisbee											0	0
shooting			1		12	10	15	11	17	14	80	1.9
athletics			3	2	14	13	21	16	21	18	108	2.6
tennis											0	0
swimming							4	5	17	17	43	1.0
gymnastics	7	5	8	12	8	15	9	16	21	16	117	2.8
handball							4	4	6	13	27	0.6
judo							4	3	4	5	16	0.4
ice hockey					3		5		4		12	0.3
canoeing									9		9	0.2
equitation										5	5	0.1

skiing			2	3	2	1	1	4	10	9	32	0.8
health physical education	4	2	2	3							11	0.3
yoga					2	5	4	4	3	7	25	0.6
orienteering									4	3	7	0.2
rhythmic gymn.											0	0
TOTAL	208	269	294	305	321	407	399	473	674	791	4141	

Legend: nB - boys, nG - girls; 1st grade, 2nd grade, ...etc. - grade of compulsory shool attendence; g - girls, b - boys; rhythmic gymn. - rhythmic gymnastics; total - number of persons actively participating in the optional subject/club; % - percentage of surveyed sample of children

DISCUSSION

The number of other clubs (clubs not offering physical activities) exceeds the number of sports clubs at schools of the Olomouc Region by 30%. The schools offer 226 sports clubs and 413 clubs not focusing on sports. Children's participation in clubs focused on sports is 39% of the surveyed sample. The results thus correspond to the findings of the project "Životní styl a obezita 2005" (ČSL JEP & ČOS JEP, 2006b), according to which Czech children do not have enough PA (young age children as well as adolescents). The group of primary school children approach the weekly recommended level, but they do not meet it. Children aged 6-12 spend on average 6 hours and 20 minutes on more demanding PA. However, specialists in the prevention of civilization illnesses recommend the minimal length of more demanding physical activity at least 7 hours per week (i.e. at least 1 hour per day). Similarly to the above-mentioned project, our survey shows that this recommended value is only met by 40% of children in the Czech Republic. In the group of secondary school children, however, the situation is much worse, as they only devote 4 hours and 40 minutes per week to an intensive physical activity.

The survey *European Health Heart Initiative* (Logstrup, 2001) showed that in all EU member states most 11-year-old children do physical exercise on average twice a week, but there are substantial differences between individual countries. This average level is met e.g. by 54% girls in France, 89% girls in Northern Ireland, 76% boys in Norway and 93% boys in Northern Ireland. In Belgium, the survey of PA and inactivity resulted in the finding that in the case of girls, the inactivity is bigger than in the case of boys. For example, 6.3% 12-year-

old boys did PA for less than 1 hour per week, but in the case of girls it was 16.5% (Lefevre, Bouckaert, Duquet, & van der Aerschot, 1999). In Denmark, boys and girls at the age of 7 - 15 are active on average 36 minutes a day. Approximately 71% of all children attend some sports club with organised PA and 17% pursue non-organised PA. While 90% of 12-year-olds state in the survey that they participate in sport, it is only 46% at the age of 17 (Wedderkopp, 2001). In England, 61% of boys and 42% of girls at the age of 7-18 met the recommended PA of one hour per day with minimally moderate intensity of physical load. According to Salmon, Telford a Crowford (2002), parents of children aged 5-6 state watching television as the most frequent activity. Boys are more active than girls in all countries and time spent on PA decreases with age in most of the countries. In our sample, children in higher grades (4th - 5th grades of primary schools) participated in free-time physical activities much more than children from lower grades (Table 1).

The results of the survey prove the share of PA on creating the human personality. An extensive number of authors deal with the problems of relations between PA and some aspects of human personality, including the relation towards sports activity or temperament features. Some authors refer to the indirect relation between the organisation in physical education and presence of youth criminality, to the positive supporting effect when treating drug addictions, and analysed children's and youth's sports practice as a prevention of drug abuse (Slepičková, 2001; Suchomel, 2002; Zapletalová, 2003; Hrčka, Bartík, Michal, & Krška, 2005). Rychtecký et al. (2006) evaluate the integration of sports and physical activities in children's and youth's lifestyle as relatively important. Nevertheless, in the age category of 9-11, children prefer spending their time by watching television (70%), playing cards, video games, computer games, listening to music, or reading a book. In their research, they state recreational, organised, and unorganised sport as the way of spending the free time of cca 40% children.

Some specialists (Matějček, 2000; Kraut, Melamed, Gofer - Froom, 2003; Zimmer, 2004; Měkota - Cuberek, 2007) see in the participation of a child in the activity in the organisations an important socialising benefit. The child has to cooperate with other members of the children's collective, s/he has to obey the rules of the games of competitions and respect them. S/he learns to respect the interests of the group, acquires the ability to take up the role of a member of such a group, and this can facilitate taking up other social roles in his/her future life. Participation in organised PA can contribute to the development of abilities and adapt better to the environment which is not pleasant to the child. Šimíčková - Čížková (2004) see positive asset of PA in in the selected group in the creation of other social bonds, in the

extension of social contacts, and confirmation of one's own self-conception. Approximately since the age of 4, children have the need of bigger social contact, and that is also why they incline to group physical activities rather than individual ones. Thanks to the physical activities it is possible to integrate children with problems in the social sphere into the collective, because verbal and non-verbal communication and physical contact is happening completely spontaneously. Physical activities enable the child to be acquainted with social groups in the sense of looking for role models, because they usually offer positive role models.

From the point of view of environmental particularities, it is possible to observe that the child requires as much emotionally positive and safe environment as possible. Integrating the child into organised PA is up to a large degree influenced by the place and way of living, parents' education, completeness of the family, economical aspects, level of external stimulation to the PA by the school and family, and other factors. In order to support PA at pre-school children, it usually suffices to create favourable conditions (they do not have to be economically demanding) and not restrict physical activities.

Maturing of central nervous system and genetically given biological time of maturation cause in primary school age approximately 25% variances among children, which influences different ability to cope with given physical tasks in the given period (Branta, 1982 - In Dvořáková, 1998). At the age of 4-6, it is recommended to extend so far acquired skills (e.g. jumping, throwing, catching, etc.) by other modifications and start teaching swimming, cycling, skiing, etc. Acquisition of these skills is often the gateway to the collective of coevals (Matějček - Dytrich, 1994).

The content of free time of young age children is decided by the family. Miklánková (2001) surveyed information on physical activities of 538 parents in the lifestyle of the family. The questionnaire was completed by 279 fathers and 259 mothers, parents of pupils of the 3rd and 4th grades of primary schools in the Czech Republic. According to the results of this survey, approximately one quarter of respondents (26.21%) completely abandoned physical activities after establishing a family. Gradual decrease of intensive PA in the lifestyle of contemporary people, despite proved positive effect on health, are confirmed by other specialists (Slepičková, 2001; Šimonek, 2004; Frömel et al., 2004; Sigmund, Frömel, & Neuls, 2005). Physical activities should eliminate negative phenomena and have positive influence on the health of an individual. Education towards correct and effective physical behaviour is indispensable so that human society can function properly (Hošková - Matoušová, 2005).

CONCLUSION

Physical activity at surveyed schools is on a fairly high level, in view of the proportion of clubs focused on sports and other clubs. As they grow up, children prefer sports activities they would like to pursue when they are older.

Focus and variety of clubs at schools in the Czech Republic (Olomouc Region) is high, it offers a wide range of physical activities and various sports out of which children have the opportunity to choose. These optional subjects are usually led by primary school pedagogues teaching at the schools themselves. Their work gives children the opportunity to increase the time spent on a physical activity in the course of the week in their free time by 1-2 hours.

Children from the surveyed sample are most interested in sports games, physical games, hockey and dance workshops.

The percentage of children who do not participate in physical activities offered by surveyed primary schools is rather high. There is an evident necessity of development of a strategy for their motivation to PA and support of education for health. In order to be successful, it is necessary to develop and respect healthy lifestyle (i.e. life in which physical activities make an integral part) already in the youngest age groups of children.

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PREFERENCE POHYBOVÝCH AKTIVIT U DĚTÍ MLADŠÍHO ŠKOLNÍHO VĚKU V ČESKÉ REPUBLICE

SÚHRN

Cílem výzkumného šetření byla deskripce a analýza preferencí v zájmech dětí v mladším školním věku se zaměřením na pohybové aktivity. Zjištění zájmů dětí o nepovinné formy tělesné výchovy, nabízené základními školami (o kroužky), bylo provedeno formou ankety. Jejím základem byla modifikovaná verze standardizovaného dotazníku ke zjištění zájmů žáků základních škol (Fromel, 1991, 1994). Zkoumaný soubor tvořilo 10711 dětí ve věku 6-12let (z

toho 5350 chlapců a 5361 dívek) ze 70 základních škol v České republice v Olomouckém kraji. Ve výběrovém souboru byly zastoupeny všechny ročníky l. stupně základních škol. Celkem 39% děti ze sledovaného souboru navštěvuje kroužky s obsahem pohybových aktivit. Výsledky byly zpracovány metodou frekvenčního výskytu odpovědí, percentuelně a graficky. Sledovaný soubor preferuje sportovní hry, pohybové hry, florbal a kroužky umožňující pohyb s hudbou (taneční kroužky, aerobic). Celkem 42% sledovaných dětí preferuje zájmové útvary, které nejsou zaměřeny na pohybové aktivity. Téměř pětina výzkumného souboru (19%) nevyužívá nabídku základních škol k zapojení do volnočasových aktivit. Proto je nutné zaměřit se na tuto skupinu dětí a stimulovat je k pohybově aktivnímu trávení volného času

KĽÚČOVÉ SLOVÁ: pohybová aktivita, zájmy, děti, mladší školní věk, 1. stupeň základní školy.

DANCE IN EDUCATIONAL PROCESS WITHIN EUROPEAN CONTEXT - A PILOT SYSTEMATIC REVIEW

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SUMMARY

Declining physical activity (PA) and sedentary lifestyle have been monitored and talked about a lot during past decades. Dance is one of the ways which may increase PA and thus also one's self-esteem. Dance is a natural type of movement with long historical and cultural traditions. However, it has not been represented equally in educational systems in different countries. This review aims to present papers dealing with the representation of dance in educational systems in European countries after 1989. Eight eligible papers were identified through systematic search across three electronic databases. Papers taken into account were studies dealing with dance in European countries' educational systems. Dance was portrayed not only physical activity, but also as a cultural phenomenon. Dance can influence attitude towards PA in general and enhance self-esteem. The reviewed studies suggest that better PE teachers' preparation could facilitate the dance inclusion into the educational curricula. Implementations of dance into educational systems in different countries have suffered from similar problems. It is not clear whether American/Canadian dance experience and findings can be applied to European environment. Further research monitoring the role of dance in education is needed.

KEY WORDS: education, curriculum, gender, culture, physical activity, Europe.

INTRODUCTION

Declining physical activity (PA) and sedentary lifestyle have been monitored and talked about a lot during past decades. Dance is one of the ways which may increase PA and thus also one's self-esteem. The link between education and level of PA was generally confirmed in researches in different environment and cultural backgrounds (Borodulin et al., 2008; Breuer, Hallmann, Wicker, & Feiler, 2010; Kalmán et. al, 2010; Saavedra et al., 2008; Sawchuk et al., 2008) so educational institutions seem to be the right place to intervene.

European education documents do not omit dance in curricula, however, is the implementation really carried out in accordance to the legislation? This review aims to present papers dealing with the representation of dance in educational systems in European countries after 1989. This year was set as the starting point of the search because of the socio-political, cultural and educational changes which occurred in late 1980s in central and Eastern Europe.

METHODOLOGY

This pilot systematic review's methods are similar to those used by Van Holle et al. (2012). The main difference was the first step of the search and total amount of papers found in the first stage.

Eligibility criteria

Suitable papers were published in English after 1989, dealing with populations in all levels of education in any European country. Included studies were focused on physical, socio-cultural and policy-making features of dance mainly. Papers were excluded when the participants were from a non-European country, when a paper dealt with dance professionals (dance conservatory students, for example) or when the main focus of the research was on dance technique. Magazines' readers' letters, school reports, news and advertisements were not considered either.

Search strategy

Systematic search through three electronic databases was conducted: Web of Science, Scopus and ProQuest Education Journals in November 2013. The search terms were (dance or dancing) in title and (school or education) in title, abstract or key words. Doing so, 828 papers were found. Afterwards, 62 duplicate papers were excluded. At first stage, both authors searched separately through one database in order to exclude papers based on title. The two searches were then compared and discussed until a mutual consensus was reached. Similarly, searches through other two databases were conducted. The next stage was to exclude papers based on title – there were 301 eligible papers left. After 301 abstracts screening, 163 full texts remained to be evaluated. After 155 of them were excluded, 8 papers (first 8 references in the list) were considered eligible for the review (Figure 1).

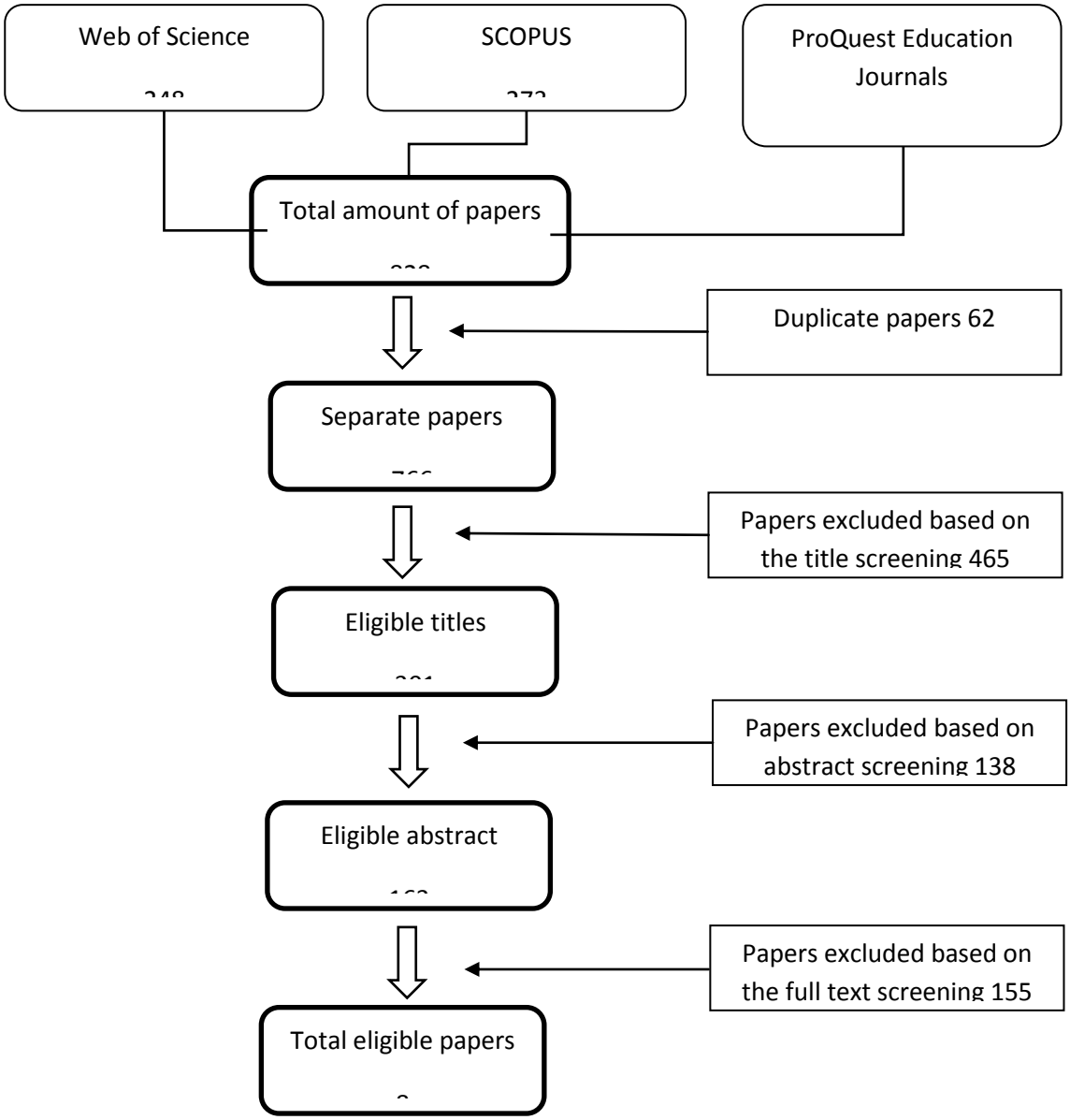

Figure 1 Flow chart of the systematic literature search. Included search terms: (dance OR dancing) in title and (school OR education) in title, abstracto or key words

RESULTS

General characteristics of the studies

From the 8 eligible papers, 5 dealt with dance in education in the United Kingdom (5); one of those studies represented Northern Ireland, another represented Scotland in particular. One study provided data from France, one from Lithuania and one from the Czech Republic. Three papers brought a dance issue as an organized leisure time activity, one study gained data from high school participants only, and four studies focused on dance in school curricula (both primary and secondary education). Three studies considered female participants only,

one paper described a dance project designed for boys and young men, one research included both male and female participants; in three studies the gender of the participants was not specified. From the research design point of view, 3 papers described a case study and 5 studies were more of a quantitative character; nevertheless, 3 of them also used interviews with participants among their methods.

Dance and curriculum

In five articles statements about difficulties with teaching dance at schools can be found. In three of them student PE teachers and PE teachers constitute the research groups. Problems with implementing dance into the school curricula and among really practiced activities are detected in articles published in 1996 (UK - Northern Ireland), 2002 (Czech Republic), 2010 (Lithuania) and 2013 (UK). It seems that there should be enough dance opportunities in all levels of education (pre-school, elementary, secondary and tertiary); in both European and national education documents there are appropriate conditions provided. However, the reality is different. The common problem seems to be a combination of two main factors: teachers' reluctance to teach dance and the fact that dance is still hugely viewed as an inappropriate PA for boys. The lack of teachers' willingness to teach dance is mostly due to low self-confidence in dance, not having enough training or opportunities to practice teaching and a lack of knowledge. Boys tend to practice such PA in which performance, strength, competition and masculinity prevail. They are afraid that doing dance will make other people see them feminized or gays. They also usually have less previous dance experience than girls and thus might feel insecure when they are asked to dance in a mixed class. Such gendered perceiving of dance is greatly present in male PE teachers; thus it is hard to expect pupils responding positively to dance which is taught by someone who does not have much of an interest or knowledge.

Teaching and learning dance

There are different forms of dance which students can learn and teaching dance can vary a lot; from teacher's demonstrating and explaining the movements and students mirroring them to supporting students' creativity in picturing specific situations or feelings. Four articles mention that the more freedom and decision making (problem-solving) students are entitled to, the better appreciation of dance students show and the deeper understanding of the dance they gain. In three papers this statement was supported by case studies: In the first study creative dance as a leisure activity wins over ballet, although the ballet performances

are considered more professional and the soloists are highly admired by their dance-mates. Boys in the second study enjoyed dancing when it was them who were highly responsible for the final form of the presented dance. The third study revealed that the proper way of dancing a foreign-culture dance was reached not after mimicking the teacher, but after teacher's feedback and questioning the students. In one quantitative study it was shown that more positive attitude towards dance could be detected in students taught by problem-solving teaching style rather than in direct-teaching style.

Dance and physical activity

The evidence of the fact that dance does enhance PA, the attitude towards PA and even one's physical self-concept, is presented in two quantitative studies. Girls (in both studies) in groups that had experienced lessons of dance (aerobic dance, respectively) showed more positive attitude towards themselves and towards PA than the ones who had experienced traditional PE lesson. These two papers were focused on girls only, stating the dance activity is generally accepted as an appropriate PA for them.

Dance and culture(s)

All 8 papers also dealt with cultural aspect of dance. One qualitative study focused on teaching a traditional dance connected to a specific culture to foreigners; the students needed not only to adopt specific movements, but also understand the feelings (expressing mythological stories in a proper way) behind them. All of the seven other studies addressed the issue of gender. The studies show that dance environment may either strengthen culturally defined difference between girls and boys (for example, pink ballet leotards or snow-white dancing shoes with pink ribbon), highlight feminine aspects and thus reinforce boys' neglecting attitude towards dance, or challenge these culturally transferred views and make it clear that there is nothing wrong with boys engaged in dance activities – as shown in 4 of the studies.

Studies design

A great variety among the methods used in dance research could be observed, even within a group of only eight studies. Three of them were case studies: one study focused on a group of 6 girls (aged 5-7 years) doing dance, one study dealt with participants of a leisure time course of Indian dance in France (number and gender not stated), and the third paper studied boys taking part in a leisure time project designed for males only (number not stated).

In all these studies observations (audio-visual recording) and interviews were used to obtain data.

One study was longitudinal, engaging 85 PE students with annual questionnaire and 10 of them participating twice (after completing their 3rd and 4th year of studies) in semi-structured interviews.

High school girls (n=138, aged 16 years; n=50, aged 13-14 years, respectively) were research samples in two cross-sectional studies where heart-rate monitors and attitude questionnaires were used.

In two studies which described difficulties with implementing dance into practice, there were diverse samples – constituting of 25 PE teaching professionals (age not stated) and 17 PE graduate trainees; and 168 dance teachers (age not stated) together with 228 students (grade 5-6), respectively. The former study used questionnaires and interviews for data collection, the latter also included pedagogical experiment in addition.

DISCUSSION

Most of the materials reviewed in this paper could be summed up by a Baneviciute's (2010, 5) quote that „…dance as a one of the subjects of arts education is hardly accepted as necessary for everyone seeking become well educated, creative, active and open member of the community, citizen of the state". However, the reviewed studies give some ideas about how to change (or, at least, try to change) this attitude. It was interesting to find out that dance-curriculum problems were discussed both in the United Kingdom in1996, in Scotland in 2007 and in Lithuania in 2010. Closer international cooperation might be suggested in the level of national educational program creation processes.

After screening nearly 900 titles and 300 abstracts it can be said that the topic of dance in education has been discussed in many more European countries (Greece, Sweden, Germany, Slovenia and others). However, the specified criteria of the review were met by 8 papers only, hence one of the selection criteria was to exclude papers focusing on future dance professionals.

Although tens of papers were excluded due to their non-European place of research, it is a fact that the topic of dance in education in Northern American continent is a frequent one. This suggests the inspiration or even advice might be looked for in this location. However, can those findings be applied in European context? Burgess et al. (2006, 59) cite American Association of University Women claiming that "swimming has been reported to be one of the most disliked physical education lessons by adolescent females". On the flipside, Frömel

et al. (2002, 26) assert that "two most popular girls' activities both in and out of school were swimming and dance". The possibility of application of U.S. findings in European context suggests further investigation. In this review the search criteria were limited to European countries only.

This review revealed some methodological issues: Not all papers have available abstracts in databases, which makes literature search a bit uneasy. Another, probably more important, methodological finding applies to the place of research. It was found out that the occurrence of research country's name in title, abstract or among key words of an article, is quite rare. Moreover, the place of research is not always mentioned in a full text either. It was the case of the U.S. mostly, where the authors often mentioned "national guidelines", "national program", "county regulations" etc. but the word "American" did not appear. The journal titles can give some hints and descriptions of school system or (in some cases) city/club/association names are helpful, too. However, indicating clearly the place of research would probably serve better.

Limits of the review

Whether the choice of search criteria has been set appropriately or not, shall be confirmed by further work. Titles including "dance" or "dancing" were meant to ensure that dance is the main topic of a particular article; similarly, words "education" or "school" should eliminate articles focusing on dance as an artistic activity.

The researchers also realize that more databases shall be searched through in the future.

CONCLUSION

Dance has faced problems with its implementation into the educational curricula across different European countries. Most commonly it has been considered inappropriate for men – both teachers and students. Reviewed studies show the benefits of dance as a physical/cultural activity being part of educational system and suggest the ways how the use of dance could be improved. As it is not clear whether American/Canadian dance experience and findings can be applied to European environment, there is a need for more research on the role of dance in education in European countries.

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TANEC V PROCESU VZDĚLÁVÁNÍ V EVROPSKÉM KONTEXTU - PILOTNÍ REŠERŠE

SÚHRN

Klesající pohybové aktivitě (PA) a převládajícímu sedavému způsobu života se v posledních letech věnovalo velké množství studií. Tanec je jedním ze způsobů, které mohou vést ke zvýšení PA a tím také ke zlepšení sebepojetí. Tanec je přirozený způsob pohybu s dlouhou historickou a kulturní tradicí, ačkoli ve vzdělávacích systémech jednotlivých zemí je zastoupen různou měrou. Tato rešerše představuje články zabývající se tématikou tance ve vzdělání v evropských zemích po roce 1989. Systematickým výběrem ze tří elektronických databází bylo získáno celkem 8 odpovídajících článků. Výběr byl zaměřen na články s tématikou tance ve vzdělávacích systémech evropských zemí. Tanec je ve studiích prezentován nejen jako PA, ale také kulturní fenomén. Tanec může ovlivnit celkový přístup k PA a také napomoci ke zvýšení sebevědomí. Po zpracování článků se ukázalo, že lepší příprava učitelů tělesné výchovy by mohla usnadnit zařazení tance do školních vzdělávacích programů.Implementace tance do vzdělávacích systémů je problém, s kterým se potýká řada evropských zemí. Není zřejmé, zda americké/kanadské zkušenosti v této oblasti mohou být beze zbytku aplikovány v evropském prostředí. Další šetření zaměřující se na roli tance ve vzdělávání je žádoucí.

KĽÚČOVÉ SLOVÁ: vzdělání, kurikulum, pohlaví, kultura, pohybová aktivita, Evropa.

INTERPERSONAL BEHAVIORS OF PEOPLE BELONGING TO THE RISK ORIENT GROUP

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SUMMARY

The research is a continuation of a study on antagonistic-destructive behaviors of the ”amateurs of strong impressions”, and an attempt to pinpoint the differentiation in interpersonal behaviors among people from certain groups preferring risky behaviors. The groups were represented by amateurs of extreme sports, juvenile criminals, and stadium hooligans. The answer to the research question was sought by using the Scale of Interpersonal Relations (SUI) by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka - Zacharuk, 1995). This instrument allows diagnosing the style of social functioning and grades the disorders of personality. To interpret the results, according to the procedure offered by J. M. Stanik (Górecki, 2001; Pospiszyl, 1999; Pytka - Zacharuk, 1995) the Du Masa test (In: Bajorek - Zieliński, 2003) was applied which indicated the ratio of similarity between the obtained profiles. The obtained values are rps (S-H) = 0,0 , rps (H-P) = -0,2 and rps (S-P) = 0,3 , where in the first two cases (sportsperson – hooligan and hooligan - criminal) it is low, while in the third one (sportsperson – criminal) we observe a moderate similarity in the profiles. The procedural analysis of the SUI segments allows to partly supporting of the hypothesis. As it was expected, amateurs of extreme physical activity, unlike criminals or pseudo-fans, are characterized by the so called pro-social syndrome. A syndrome opposite to this one shows in pseudo-fans, who take the upper hand in the syndrome of hostility against juvenile criminals, having extremely high position in the profile. The level of validity $p<0,05$ for the specific pairs of profiles in the research groups allowed to define the similarity of interpersonal relations scales for juvenile criminals and extreme sportsmen, as well.

KEY WORDS: risk, extreme sports, person criminal, pseudo-fan, interpersonal relations.

INTRODUCTION

The insisting need of stimulation is becoming a natural existential process of a modern human being. The respondents – amateurs of strong impressions: extreme sports people, juvenile criminals and stadium hooligans undertake activities which are shocking by their unpredictable consequences. (Stanik, 1980; Carpenter et al.,2009).

The reasons for the increasing amount of people with reduced reactivity to environmental factors are multifaceted. No matter whether the reason for shifting the threshold of stimulation expectations is caused by: more frequent than before contact with makro- and micro-social factors (Goodman, 2001), slower compared to others maturation of the nervous system (Friedman, et al., 2003), or, finally, the conflict between cerebral cortex and midbrain (Farley, 2000), the form of satisfying their needs chosen by respondents is always determined by the methods of natural upbringing (Brzeziński, 1999).

The results of the tests carried out on the social immaturity and Peer rejection that first mentioned factor correlates with appear human multiple symptoms of hyperactivity, while the other (peer rejection) - a high-level, closely associated with increased aggression and IQ subjects (Carpenter et al., 2009).

The term “extreme sport” is not easily defined nor is it easily delimited, but it may be defined as recreational physical activity that carries a risk of serious physical injury or even (Willig, 2008). The term "extreme sport" has become a well-known label for relatively new activities like climbing, bungee jumping, free ride skiing and snowboarding, surfing, hang gliding and paragliding, kayaking, rafting, small plane aerobatics, full contact marital, skydiving and BASE (Slanger, Rudestam, 1997; Willig, 2008).

Irrespective of belonging to the research group, the representatives of stadium hooligans, juvenile criminals or extreme sports people are those who prefer risk behaviours. Different internalization of norms and values among the representatives of these three groups leads to different collective behaviors (Farley, 2000), due to which they satisfy their weird to the majority of society needs. It seems puzzling in which spheres of social life and to what extent the “amateurs of strong impressions” (Allison, 2005) reveal a similar approach to the surrounding world (Stanik, 1980).

METHODOLOGY

The whole of the research group is 180 people. This group is represented by amateurs of extreme sports (downhill biking, deep see diving, parachuting), detained and the stadium hooligans.

The groups of juvenile criminals (30,0 %), amateurs of extreme sports (31,7%) and stadium hooligans (20,0%) are dominated by people at 23 years of age. The least representative in the research were 24 year old criminals 3 (5,0%), 2 (3,4%) pseudo fans at 28 years old, and sports people at 18 years old (1,6%). There were no respondents at 25 years old in the research groups.

The division of the group into countryside, small town up to 12 thousand citizens and city revealed the proportion of inhabitance for the representatives of districts in towns. Thus, 65% are the convicted, while 100% are pseudo fans. Amateurs of downhill ride and parachuting have in the majority (80%) a city background. There was a disproportion among countryside residents (convicted 15%, downhill riders and parachutes 5%, hooligans 0%) and among small town residents (convicted 20%, sports people 15%, pseudo fans 0%).

Observation of the research group showed a considerable differentiation in the family structure of the respondents. Most of the convicted come from incomplete families (25,0 % broken family, 11,6% one parent missing). Much similarity in family structure is noticeable in the groups of juvenile criminals 11,6% and amateurs of extreme physical activity (10%).

Likewise criminals, the most representative group of pseudo-fans (60%) were the people coming from complete families. The smallest group of hooligans (13,3%) was brought up in broken families. The reasons (considering other answers of the respondents) of the difficult family situation (e.g. alcoholism or antisocial features of the parents) influenced the current situation of the respondents.

In order to answer the question in the research assumption the Scale of Interpersonal Relations (SUI) by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka – Zacharuk, 1995) was applied. This tool helps to diagnose the style of social functioning and diversification of personality disorders. The acquired answers to 70 questions are shaped into 12 scales of an individuality profile in the categories: 1) authoritative-bossy, 2) supportive – overcaring, 3) friendly – cooperative, 4) submissive – dependent, 5) withdrawn – masochistic, 6) rebellious – suspicious, 7) aggressive - sadistic, 8) competitive – narcissistic, 9) self acceptation, 10) lying, 11) envy, 12) helplessness (Stanik,1980).

RESULTS

The interesting fact is that the same motive is a stimulus for activity among the three research groups. It is the increased need of stimulation. Arbitrarily defined interaction differences and common motive urge to seek for the support of the research claims. According to J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) all

styles of interpersonal functioning exist in two dimensions: "domination-submission" and "love-hatred". Locating the representatives of each research group among the opposites an eight grade calculation scale has been used for each SUI layer, where J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) assumed that the distance between the octiles is 12,5% of population. Each octile has received its description (Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995).

Using the calculation table, the values of each SUI profile have been obtained taking into consideration the division into specific research groups. Comparing sports people with stadium hooligans and criminals most of the scales show different values. Similarities are seen only in scales: 3, 4 and 11 in the profiles of extreme physical activity amateurs and outlaws. These are shown in a table (Table 1) and graphically (Figure 1).

Table1 Calculated results in each scale for the groups of extreme sports people (S), juvenile criminals (P), stadium hooligans (H)

Group	Scale (calculated results)											
	1	2	3	4	5	6	7	8	9	10	11	12
S	7	5	4	7	3	1	7	6	2	6	3	4
H	7	2	2	3	5	7	8	8	4	4	2	5
P	4	2	5	7	5	4	5	6	7	5	3	5

To interpret the results, according to the procedure by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995), the Du Masa test was applied, which allowed to draw the ratio of similarity of the profiles. The values of rps (S-H) = 0,0, rps (H-P) = -0,2, rps (S-P) = 0,3, show in the first and second juxtaposition (sports person – hooligan and hooligan – criminal) a low, while in the third one (sports person – criminal) a moderate similarity of the profiles, which is reflected in the graph (Figure 1).

According to J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) respondents from the sports groups are characterized by increased, while juvenile criminals by lowered authoritative-bossy style (scale 1). The increased style is seen in the group of extreme sports people and stadium hooligans, which can be reflected in irrational and increased feel of competence in cooperating with others and leadership tendencies. Such individuals are often characterized by a reserved attitude towards others along with increased sensitivity to one's self assessment. Representatives of the criminals group compared to the

individuals seeking strong impressions in sport, are lower on the scale of the values (for criminals the value is 4, which J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) defines as a norm.

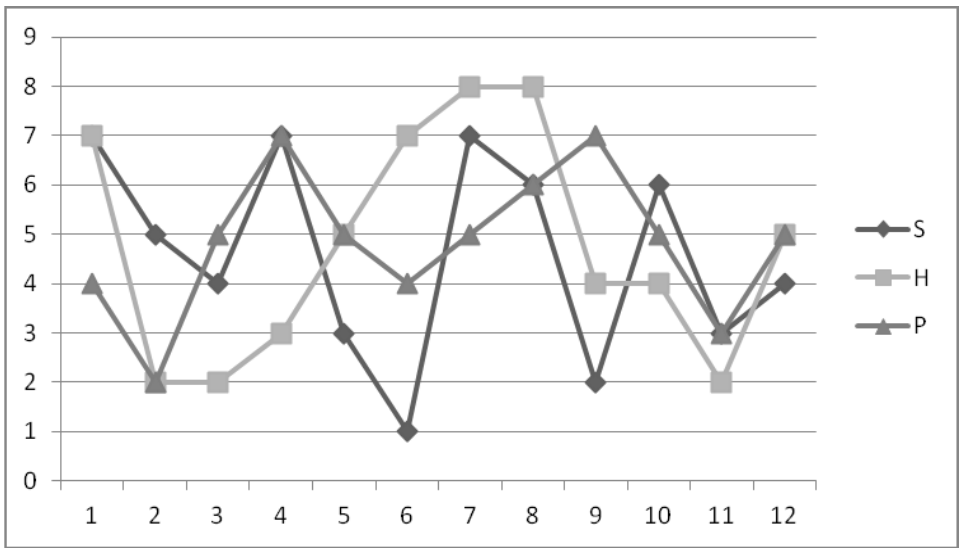

Figure 1 SUI profiles for the groups of extreme sports people (S), juvenile criminals (P) and stadium hooligans (H) on the basis of calculated results

According to J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) respondents from the sports groups are characterized by increased, while juvenile criminals by lowered authoritative-bossy style (scale 1). The increased style is seen in the group of extreme sports people and stadium hooligans, which can be reflected in irrational and increased feel of competence in cooperating with others and leadership tendencies. Such individuals are often characterized by a reserved attitude towards others along with increased sensitivity to one's self assessment. Representatives of the criminals group compared to the individuals seeking strong impressions in sport, are lower on the scale of the values (for criminals the value is 4, which J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) defines as a norm.

Scale 2 indicates the style of social functioning called supportive – overcaring (Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995). In the case of criminals and pseudo fans the profiles are in the second octile (extreme low), which suggests that such individuals are reluctant to show a desire of taking responsibility for others, care or devotion. Juvenile criminals and hooligans are not especially interested in broadly understood common good. It appears that sports people (5 octile).

Comparison of profiles in scale 3 (friendly – cooperative) shows that in case of hooligans the graph remains at the level of second octile. It explains lack of readiness to compromise in conflict situations and negative attitude towards the partner. Respondents from this group do not care about friendly and proper social relations. Analysis of the third scale in the basic groups shows that this style looks similar for the criminals (5 octile) and amateurs of high risk sports (4 octile). The values for this group in this scale are in favour of criminals and sports people.

Scale 4 represents the submissive – dependent style. It appears that the graphs are identical for groups "S" and "P". Respondents with high values, who are criminals and extreme sports people are characterized by lack of submission and troubles with subordination. Rebellious against social phenomena they avoid interpersonal contacts when they are to be faithful or submissive. Only the hooligans graph surpasses the third octile of the scale.

According to Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) scale 5 describes the withdrawn – masochistic style. Criminals and pseudo fans show the results at the level of 5 octile – and that's the norm. The results for sports people reveal that they, unlike other respondents, do not strive for social contacts and have moderate attitude to the surrounding world (3 octile).

Juvenile criminals made a self description which was calculated, in case of scale 6 (rebellious – suspicious) as fourth octile (average level), sports people show a low level (first octile), while stadium hooligans are the highest at 7^{th} octile. We can hypothesize that the higher the level, the higher probability for the respondents to display hostile and antisocial behaviors. They are cold towards others, suspicious and disregard the external social order, demonstratively disobey any orders. According to Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) a higher result for pseudo fans in scale 6 shows a stable tendency to activate defensive, trustless, suspicious behaviors towards others as well as a syndrome of hostility in some cases.

With the help of scale 7 we can describe the aggressive – sadistic level. The highest eighth level sports people – seventh, criminals – fifth octile) are the stadium hooligans. Such shape of the graph is characteristic for the people of excessive criticism, hostility towards themselves, and first of all treating themselves as individuals better in some aspects than others.

For criminals, like for sports people, scale 8 (competitive – narcissistic style) is at lower level (6 octile) than for pseudo fans (8 octile). Increased level for the research group indicates the tendency for superiority behaviors and exaggerated manifestation of one's independence.

A considerable span between the graphs is seen in scale 9 – self-acceptation and self-content. The sports people graph shows regression to the level of second octile. Such a result in these research groups reveals low self-esteem, or, as defined by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) social reluctance. Definitely higher (7 octile) than others are juvenile criminals.

The results in scale 10 for all the respondents are within the norm. According to the author of the scale (Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995), this can testify for the intentions (subconscious or conscious) of the respondents involved in the research. They were eager to carefully answer the questions in the SUI scale. Overstating the values in this scale can be treated as conscious strive for falsifying the results in order to conceal the "negative truth" about oneself.

Envy, realism and relative autonomy are defined by scale 11. It appears that self characteristics of juvenile criminals, same as sports people, calculate into similar values and place a little lower the norm (third octile). The lower the level the more often individuals will be characterized by low self esteem, lowered esteem of their position in life, but optimal vision of their abilities, which represents scale 12 Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995).

DISCUSSION

From conducted examinations through Theeboom, De Knopi ,Wylleman (2008) shows that there is a close relationship between regular participation in training athletes and their social activities.

Made analysis between physical activity of people and their social functioning (Allison et al., 2005) showed that with increasing involvement of people in sports training, increasing their likelihood of susceptibility to interpersonal disorders. Also, it can be concluded that individuals may have a sensitivity to social norms violation by others (Friedman et al., 2003)**.**

The procedural analysis of SUI segments (Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) allows to partly confirm the formulated hypothesis. As it could have been expected, amateurs of extreme physical activity, unlike criminals and pseudo fans, are characterized by the so called pro-social syndrome. Average and high score in scales 2, 3, 4 means that the respondents will represent socially acceptable behaviors based on satisfying

their needs which agree with the social ones. This has been also recognized in the individuals studied by the author of SUI scale with neurasthenia, depression and hysteria. Amazing is the fact that stadium hooligans prove to be worse against criminals within the analyzed segment of the scale. They (H) represent the extremely antisocial attitude.

Analysis of the syndrome of hostility (scales 5, 6, 7 and often 8, 9) in the research groups revealed considerable similarity of the created profiles for the patients of Stanik (1980) (those with neurasthenia, depression and hysteria) and those diagnosed in the research hooligans (H). This proves the respondents' higher than other research groups negative attitude to the surrounding world. Definitely marginal, increased values in these profiles create a picture of distrustful, suspicious people manifesting open aggression.

The egocentric syndrome reveals in higher values in scales 1 and 8 and lowered values in profiles 9 and 12 which is characteristic for the sports group (S), hooligans (H) and the respondents studied by the author of the scale. This machiavellian kind of the syndrome represented by the mentioned groups is characterized by authoritarian attitudes in contacts with others. Respondents who possess such attitude to the world evaluate it from their own perspective striving to persuade their own social interests as well as not striving by all means to establish new contacts (scale 1). These people notably strive to rule others, however, lowered self acceptance and minimal self satisfaction sensitize these people to the public opinion (scale 10).

Calculation of the level of validity for the pairs created from the profiles of the research groups allowed to confirm the above justifications based on interpretation offered by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995). There appear small differences between the scales of interpersonal relations of extreme sports people and juvenile criminals. Radical discrepancy between the profiles is seen for sports hooligans compared to the other groups. In case of each syndrome under analysis and the research group a similarity of profiles is also seen between the research groups of this study and people diagnosed by (Stanik, 1980).

CONCLUSIONS

The research procedure offered by J. M. Stanik (In: Górecki, 2001; Pospiszyl, 1999; Pytka, Zacharuk, 1995) allowed to notice similarities in functioning of the three social groups: amateurs of extreme sports, juvenile criminals and stadium hooligans. It appears that in certain life situations representatives of the first two groups (S and P) react identically (scales 4, 8, 11) which supports similarities of the created profiles (rps = 0,3). It is clear that the

convicted, like sports people, are searching in their life such situations which could help to satisfy the strive for strong impressions. The obtained results indicate the structural interference between the styles of social functioning for the groups of criminals and sports people. The considerable span (marginal levels in most scales) in comparison with these research groups is shown for stadium hooligans.

It is this group that leads in antagonistic-destructive behaviors. The only similarity with other groups is seen in scales 11 and 12. Identical reactions of pseudo fans and sports people are seen only in scale 1 (7 octile). The respondents who in the first scale obtained an above average result are characterized by strong social independence, are reluctant to public pressure and they often avoid situations where they are to be subjected. This type can be named as "rebels by their own choice". They manifest their importance through exaggerated glorification of their own self only to demonstrate their desire to attract attention. Comparison of stadium hooligans with criminals showed that these two groups of respondents more often than in the above analysis are characterized by similar attitude to the surrounding world (in scales 2, 5, 12).

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MEDZIĽUDSKÉ SPRÁVANIE OSÔB PATRIACICH K RIZIKOVÝM SKUPINÁM

SÚHRN

Výskum bol realizovaný formou štúdie antagonistických vzťahov, ako pokus určiť diferenciáciu v medziľudskom správaní medzi ľuďmi z určitých skupín, ktorí preferujú rizikové správanie. Tieto skupiny boli zastúpené milovníkmi extrémnych športov, mladistvými delikventami a chuligánmi zo štadiónov. Odpoveď na výskumnú otázku bola požadovaná pomocou stupnice medziľudských vzťahov (SUI) JM Staník (In: Górecki, 2001; Pospiszyl, 1999; Pytka - Zacharuk, 1995). Tento nástroj umožňuje diagnostikovať štýl sociálneho fungovania a stupňami porúch osobnosti. Pre interpretáciu výsledkov, v súlade s postupom, ktoré ponúka JM Staník (Górecki, 2001; Pospiszyl, 1999; Pytka - Zacharuk, 1995) testu Du Masa (In: Bajorek - Zieliński, 2003) sme aplikovali uvedené pomery podobnosti

medzi získané profily. Získané hodnoty boli nasledovné (S-H) = 0,0 , (H-P) = -0,2 a (S-P) = 0,3, kde v prvých dvoch prípadoch (športovec, hooligans a mladiství delikventi) sú nízke, zatiaľ čo v treťom (športovec - mladiství delikventi) pozorujeme miernu podobnosť profilov. Procesná analýza segmentov SUI podporuje našu hypotézu. Ako sa očakávalo, extrémni športovci, na rozdiel od mladistvých delikventov alebo chuligánov so štadiónov, sú charakterizovaní tzv. prosociálnym syndrómom. Úroveň platnosti $p<0,05$ pre konkrétne dvojice profilov výskumných skupín nám umožňuje definovať podobnosť v medziľudských vzťahoch medzi mladistvými delikventami a extrémnymi športovcami.

KĽÚČOVÉ SLOVÁ: riziká, extrémne športy, mladistvý delikventi, pseudo - fanúšikovia, medziľudské vzťahy.

INSTRUCTIONS FOR MANUSCRIPT

The ACTA UNIVERSITATIS MATTHIAE BELII PHYSICAL EDUCATION AND SPORT is a peer-reviewed scientific journal. The content of the magazine is focused on presentation of research notifications and theoretical studies connected with the problems of science of sport. The Editorial Board is looking forward to all manuscripts written on the above subject.

General instructions

Deadline for submissions for each issue of the journal is
30 May, respectively **30th November.**

The text of the contribution is in English. The contribution is not to exceed a maximum limit of 15 pages (including tables, pictures, summaries and appendices). A summary will be in the Slovak language, and by rule 1 page at the most. The text is to be presented in MS Word editor.

All contributions are reviewed anonymously.

Interface of the contribution

Title of the contribution, name(s) of its author(s), workplace, summary of the text in English, key words.

Text of the contribution

Names of individual chapters are to be written in capital letter from the left margin. References to quoted authors see a brief from the publication.

Epilogue of the contribution

A reference summary, summary including the key words.

Tables, pictures, graphs, appendices

To be written on separate pages. A table is to be marked as TABLE 1 with its name below, write on the left margin above
the table (the same applies for appendices). A picture is to be marked as Fig. 1, write from the left above the picture (the same applies for a graph). All contributions to Acta … must have been corrected by an English expert before being submitted to us. If possible we would appreciate the text in the original language.

We look forward to our further cooperation.

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Všeobecné pokyny

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