ACTA
UNIVERSITATIS PALACKIANAE OLOMUCENSIS
GYMNICA

Vol. 40
No. 2

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GYMNICA

Vol. 40
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PALACKÝ UNIVERSITY OLOMOUC

2010

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ISSN 1212-1185

CONTENT

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PREFERRED CONTENTS IN PHYSICAL EDUCATION LESSONS – POSITIVELY EVALUATED MEANS FOR THE ACHIEVEMENT OF A HIGHER INTENSITY OF PHYSICAL ACTIVITY BY GIRLS

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Submitted in March, 2010

BACKGROUND: Physical Education (PE) has been one of the key determinants in an education towards a physically active and healthy lifestyle. The role of PE is to form positive attitudes in children towards regular physical activity (PA) and show them the broad scale of types and intensities of PA and ways of teaching them.

OBJECTIVE: The aim of this study is to examine relationships and identify determinants in the evaluation of PE lessons differing in content and PA intensity in girls.

METHODS: To estimate the relationships between PA intensity in PE lessons and their evaluation, data on 2,213 girls aged 13–17 monitored in 205 PE lessons with different contents (aerobics n = 35, athletics n = 30, sport gymnastics n = 33, sport games n = 61 and dance n = 46) between 1997–2003 were used. PA intensity was monitored using the Caltrac (METs/45min.) accelerometer. To evaluate PE lessons, the standardized Assessment of Physical Education Lessons Questionnaire was applied (% of positive answers in the emotional, social, relationships, and health dimensions).

RESULTS: In cases of preferred PA activities in girls (dance, aerobics, sport games), a higher PA intensity was reflected positively in the evaluation of PE lessons. In activities not preferred by girls (athletics and sport gymnastics), a higher PA intensity was reflected negatively in PE lesson evaluation.

CONCLUSIONS: PE lessons with preferred contents such as dance, aerobics and sport games in girls are appropriate situations in which to carry out PA with a higher intensity. The employment of games or game – like lesson guidance can make PE lessons with less favoured content more attractive.

Keywords: Aerobics, dance, sports games, gymnastics, athletics, METs.

INTRODUCTION

The worldwide decline of physical activity (PA) in children, youth and adults (Haskell et al., 2007; USDHHS, 2000) and an increase in health problems resulting from it, calls for changes that would improve this situation (Cavill, Kahlmeier, & Racioppi, 2006). While searching for suitable intervention programs for increasing PA in adults is rather difficult, in the case of children and youth the situation is simpler. Physical Education at schools is one of the verified and efficient programs that can be used to increase PA and physical fitness in youth (European Commission Sport, 2008; Strong et al., 2005).

The school environment represents an opportunity for implementing PA, nutrition and other lifestyle intervention programmes. As children spend much of their childhood there, healthy lifestyle habits can be instigated and maintained (Biddle, Gorely, & Stensel, 2004; Sharma, 2006). Effective PA in adults needs to last for 20–60 minutes without a break, but health enhancing PA in children can be carried out in shorter, 10 to 15 minute intervals adding up to 60 minutes or more of moderate to vigorous PA daily (Strong et al., 2005; Wright, Patterson, & Cardinal, 2000). These shorter PA episodes are carried out in Physical Education (PE) lessons and also during recess periods and at lunch breaks (Mota et al., 2005; Verstraete et al., 2006). However, increasing PA in school children is effective only when parents are involved (Biddle, Gorely, & Stensel, 2004; Sharma 2006).

The main goals of elementary education include creating preconditions for active learning over the lifespan that also incorporate health enhancement (MŠMT, 2001). There is an emphasis on interweaving "life at school" with "life outside of school", with the possibility to test the efficacy of curricula. This has been also reflected in the general goal of PE that is the establishment of a positive attitude towards regular, lifelong and voluntary PA in children and youth (Corbin, 2002; Daley, 2002). Results from international research show that the participation of children and youth in organized types of PA positively influences the likelihood of its being performed further in adulthood (Kraut, Melamed, Gofer, & Froom, 2003; Trudeau, Laurencelle, Tremblay, Rajic, & Shephard, 1999). Moreover, for many adolescents, PE

at school is the only source of an intensive type of PA within their weekly PA (Sigmundová, 2005). Also due to these reasons, PE is considered to be an essential means in the support of an active and healthy lifestyle in adolescents and adults (Corbin, 2002; Stone, McKenzie, Welk, & Booth, 1998).

The regular active participation of pupils and students in PE classes is not however automatically guaranteed despite the fact that PE is listed as a compulsory subject. There is an ever increasing number of students who "repeatedly do not exercise" or are excused from participation in these classes although there is an increasing number of fully qualified PE teachers. A study by Sallis et al. (1999) reviewing opinions on PE in pupils and students aged 10–18 regardless of their age, nationality, sex and different family, social and economical backgrounds shows that students expect from PE primarily:

- a feeling of experiencing satisfaction from PA and a friendly atmosphere,
- the possibility of carrying out the PA also in one's free time outside of school,
- a choice of preferred PA that can be done, for example, with parents.

Similar findings have been identified in the Czech Republic by Sigmundová, Frömel, Havlíková and Janečková (2005). A fondness for PE depends primarily on the lesson content, teaching style and the particular group of students.

The school environment also plays an important role in PA enhancement. In case there is an attractive environment enhancing PA (spacious enough, safe, and well-equipped) with supervision provided, both girls and boys aged 11–14 are significantly more physically active there ($p < 0.001$) in comparison to an environment without the appropriate equipment and without supervision (Sallis et al., 2001).

The relationship between PA intensity and the evaluation of PE lessons has been studied systematically in the Czech Republic primarily in girls (Frömel, Lehnert, & Vašendová, 2000; Pelclová, Frömel, Skalik, & Stratton, 2008; Vašíčková, 2002). However, these studies deal only with cases of aerobics, dance and volleyball PE content. And the classification of the intensity of such PA was done subjectively, according to the perceptions of girls, not objectively by means of accelerometry. Since girls are, in all age categories from 12 to 24, less physically active than boys (Sigmund, Croix, Miklánková, & Frömel, 2007), we suppose that if PE lessons had content generally preferred by girls, such as aerobics, dance or volleyball, this would have a positive effect.

Innovative changes done in PE lessons have not been accompanied by a decline in the intensity of PA in girls (Frömel, Lehnert, & Vašendová, 2000; Pelclová, Frömel, Skalik, & Stratton, 2008; Vašíčková, 2002). However, a more profound analysis of the relationship between the intensity of PA and the evaluation of PE lessons with various content resulting in concrete recommendations for teachers are still needed.

AIM

The main aim of the study is to identify the relationships and determinants affecting the evaluation of PE lessons with different contents as related to the intensity of physical activity in girls.

The long term and repeated monitoring of PE lessons in 1997–2003 using the same standardized methods (Frömel, Novosad, & Svozil, 1999) allowed us to gather data for an extensive sample of girls (n = 2,213) aged 13–17. Due to this fact, we can form the following hypotheses regarding the relationship between the evaluation of Physical Education lessons with different contents and PA intensity:

H_1: In PE lessons with a favoured content, a higher intensity of physical activity will not be reflected negatively in the assessment of the lessons by girls.

H_2: In PE lessons with a less favoured content, a higher intensity of physical activity will be reflected negatively in the assessment of the lessons by girls.

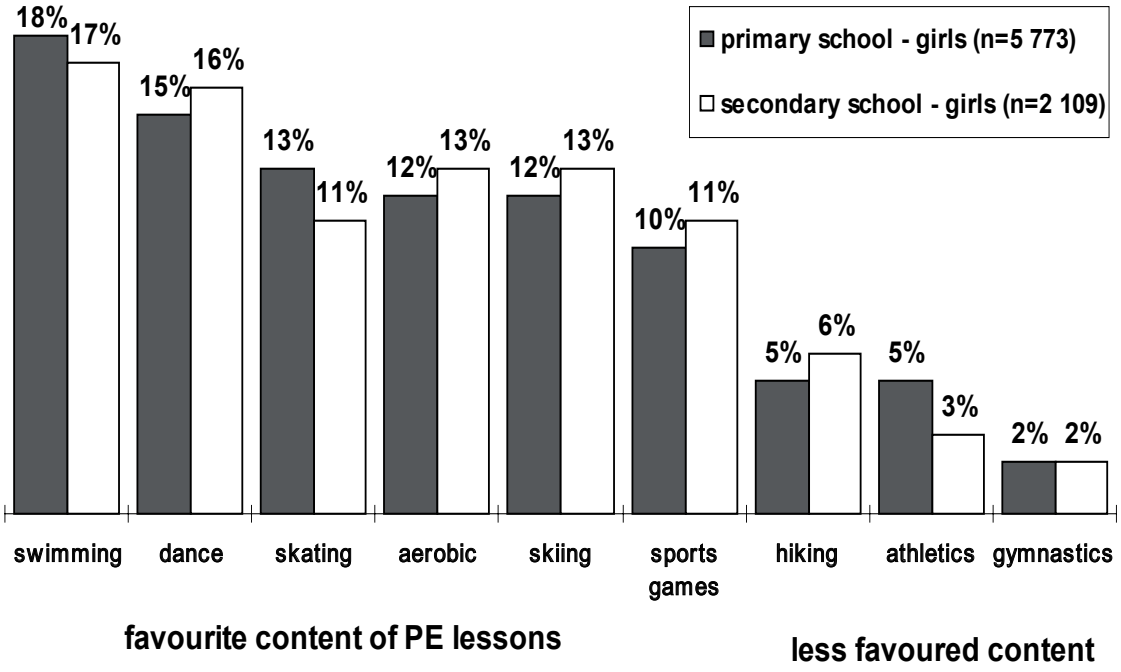
Commentaries to hypotheses H_1 a H_2

These hypotheses are based on Mill's rule of one coincidence, which can be, according to Hendl (2005), interpreted as follows: if two or more cases have only a single characteristic in common, then this common characteristic is their cause or consequence. The monitored PE lessons took place in different seasons and on different days of the week, both during morning classes and afternoon classes. Among the teachers were experienced teachers, starting teachers and teacher trainers, both men and women. The number of girls in the classes ranged from 10 to 35. The only common characteristic in the analyzed group of PE lessons was the same content.

The hypotheses contain three terms: a) the intensity of physical activity, b) the assessment of PE lessons and c) the fondness of a lesson's content which still needs to be studied.

a) *Intensity of physical activity* – the reaction of the organism to physical load in the course of PE lessons. Using the Caltrac accelerometer for monitoring, we quantify this in METs calculated for the 45 minute duration of a PE lesson.
b) *Evaluation of school Physical Education lessons* – closed answers were obtained from the standardized Assessment of Physical Education Lessons Questionnaire, with written and anonymous girls' opinions on the organization, management and the course of the PE lessons. We quantify them using the % of positive answers from the questionnaire in the emotional, social, relational and health dimensions.

Fig. 1
Preferences of sports (%) in girls at primary and secondary schools in the Czech Republic



c) *Fondness for the content of Physical Education lessons* – the level of preference of a PE lesson's content. The criterion for differentiating the PE lesson content as being either *favoured and less favoured* was a ≥ 10% preference for individual types of PA in the nationwide survey of PA preferences in girls in the years 1997–2003 (Fig. 1).

METHODS

Participants

To assess the associations between the assessment of PE lessons with various content and PA intensity, data from 2213 girls aged 13–17 from three regions of the Czech Republic (Moravian-Silesian, Olomouc, and Zlín) were processed. The monitoring was carried out using the same methods in 1997–2003. In total, 205 PE lessons were monitored; with dance, aerobics, games, athletics, and sport gymnastics (TABLE 1). Girls' participation in the survey was voluntary and no incentives were paid to them. This study was approved by the Ethical Committee at the Faculty of Physical Culture at Palacký University in Olomouc.

Monitoring of PA in Physical Education lessons

The intensity of PA in PE lessons was monitored using the Caltrac accelerometer and then calculated for individual characteristics (body weight and height, age and sex), and expressed in METs/45min. Each girl had the accelerometer set up according to her individual characteristics. The elastic belts with Caltrac accelerometers were secured tightly in their position on each participant's right hip for the duration of the physical education lesson. The authors of the study were responsible for the measurement of the girls' individual characteristics, the correct set-up of the Caltrac, its correct placement on the participants' body during a PE lesson, and recording the data into the record sheets.

TABLE 1
Analyzed Physical Education lessons, their number and the age range of participating girls

Physical Education lessons		Girls	
content	number	number	range of age
Dance*	46	655	13.5–16.8 year
Aerobics	35	488	13.7–16.9 year
Sports games**	61	509	13.2–16.7 year
Athletics	30	210	13.5–16.8 year
Gymnastics	33	351	13.3–16.9 year

Legend:
* country, Latin, folk and rock & roll
** volleyball, basketball and hadball

The evaluation of PE lessons

The evaluation of PE lessons was done using the standardized Assessment of Physical Education Lessons

Questionnaire (Frömel et al., 1996). Immediately after a lesson had been finished, all girls could anonymously evaluate the PE lesson by responding in closed answers (YES/NO) to questions regarding its organization, management, and the course.

The questionnaire consists of 24 questions, divided into six dimensions (emotional, creative, social, education, relational and health) and an additional dimension – the pupil's role. In compliance with the aims of this study, the emotional, social, relational and health dimensions were analyzed as they show the pupil's relationship to the lesson the most. Individual questions in each dimension and positive answers are in TABLE 2.

The verification of the Assessment of the Physical Education Lessons Questionnaire was done in 440 pupils in 27 classes at schools of different types to test their internal consistency using the t-test. Statistically significant differences ($p > 0.05$) in the answers were found in only 5 out of 27 classes and the coefficient of internal consistence had the value of $r = 0.63$ ($p < 0.001$). When verifying the questionnaire, the relationships between the emotional, social, relational and health dimensions in 114 pupils ranged between $r = 0.36–0.55$ with $p < 0.05$. The coefficient of stability tested in 103 pupils was $r_{tt} = 0.82$, and at the level of dimension it was $r_{tt} = 0.92$. Lower but still statistically significant ($p < 0.01$) was the coefficient of validity ($r_{xy} = 0.42$) which was interpreted in relationship to the results of the evaluation scale (Frömel et al., 1996).

Statistical analysis

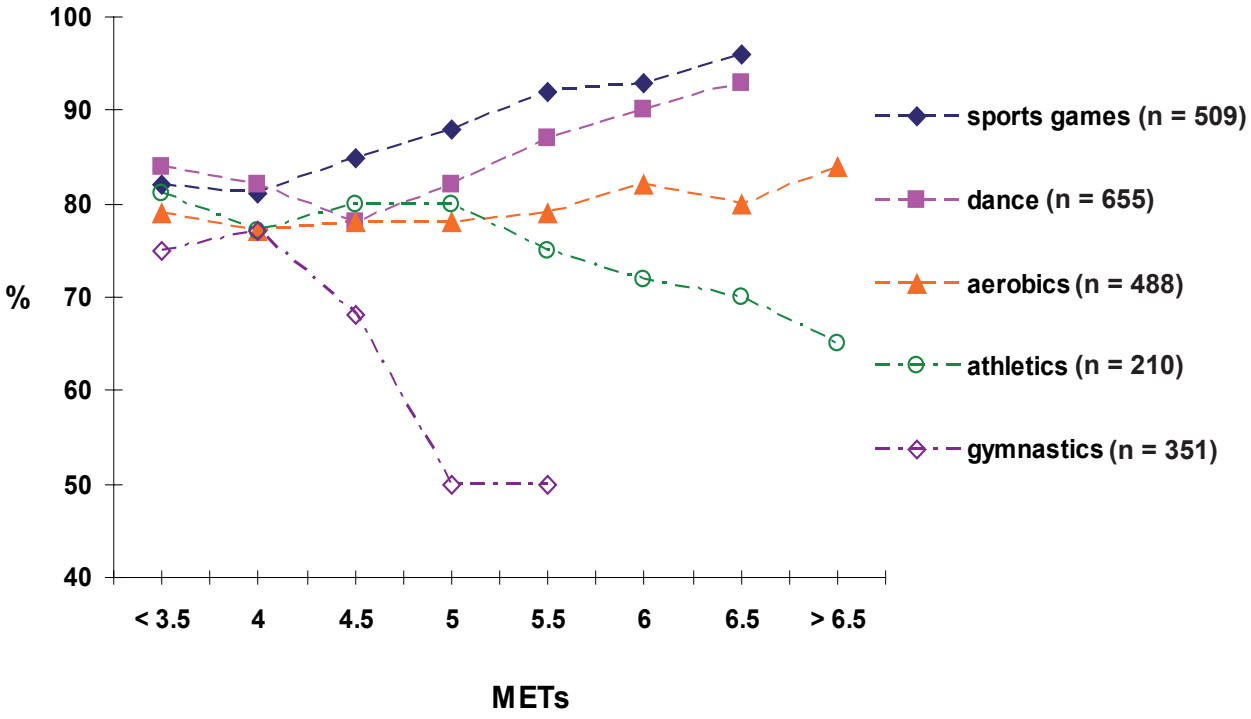
Specially designed software (Chytil, 2001) was used to process the data from the questionnaires and record sheets. Moreover, the software provides individual feedback regarding the results from the monitoring. In order to present the evaluation in Figures, we used the arithmetic means for the percentage representation of positive answers in each dimension in the questionnaire. The verification of the hypotheses is carried out on the basis of the Kruskal-Wallis and Mann-Whitney non parametric test (Statsoft ČR, 2007). The size of the effect of the variable of *PA intensity* on the variable of the *evaluation of PE lessons* is calculated using the coefficient "effect size" η^2 (Kruskal-Wallis nonparametric test) and d (Mann-Whitney nonparametric test) (Cortina & Nouri, 2000; Morse, 1999). The most common assessment of the d and η^2 coefficients is:

- d – small effect ($0.2 < d \leq 0.5$), medium effect ($0.5 < d \leq 0.8$) and large effect ($0.8 < d$) (Cohen, 1988; Sheskin, 2007).
- η^2 – small effect ($0.01 < \eta^2 \leq 0.06$), medium effect ($0.06 < \eta^2 \leq 0.14$) and large effect ($0.14 < \eta^2$) (Morse, 1999).

TABLE 2
Questions and positive answers in the four dimensions of the standardized Assessment of Physical Education Lessons Questionnaire

***1. EMOTIONAL** dimension*	***Positive answers***
• Was the physical activity satisfying?	**YES**
• Was there a good feeling about the class?	**YES**
• Was the class fun?	**YES**
• Where you praised by the teacher or a classmate?	**YES**
***2. SOCIAL** dimension*	
• Did you see the teacher as an adviser and a friend?	**YES**
• Did classmates misbehave during the class?	**NO**
• Did you ask any questions during the class?	**YES**
• Did you correct any mistakes made by your classmate or did a classmate correct you?	**YES**
***3. RELATIONAL** dimension*	
• Would you like to have the same or a similar class next time?	**YES**
• Would an extra curricular activity be better than participating in this class?	**NO**
• Would you have preferred to attend another class?	**NO**
• If you had been allowed to leave the class and go home, would you have done so?	**NO**
***4. HEALTH** dimension*	
• Were you relaxed after the class?	**YES**
• Was there a good feeling about the class?	**YES**
• Do you think that the class improved your fitness?	**YES**
• Do you think about your posture during the lesson? Did you do any stretching?	**YES**

Fig. 2
Evaluation of Physical Education lessons in the emotional dimension of the questionnaire (% of positive answers) according to intensity of physical activity (METs)



RESULTS

On the basis of the evaluation of PE lessons with various content in the emotional dimension by girls, it is apparent that the evaluation of a PE lesson decreases if there is higher PA intensity in lessons with gymnastics and athletics (Fig. 2). The comparison between the lowest and the highest PA intensity shows that there is a significant decrease in lessons with gymnastics (75% with < 3.5 METs × 50% with 5.1–5.5 METs; $p < 0.001$; $d = 1.13$) and athletics (81% with < 3.5 METs × 65% with > 6.5 METs; $p < 0.01$; $d = 0.78$) as PE lesson content. On the other hand, in lessons with sport games and dance, higher PA intensity in PE lessons was accompanied by a higher evaluation in the emotional dimension than in classes with lower PA intensity (Fig. 2). Although a 14% (or 9%) increase in the positive evaluation of PE lessons with games or dance is not statistically significant ($p = 0.04$; $d = 0.50$ or $p = 0.06$; $d = 0.39$), the values of the coefficient show the small or medium positive effect of PA intensity on the evaluation of PE lessons.

The tendency to evaluate more positively PE lessons with a favoured content (sports games, dance and aerobics) and higher PA intensity (> 5 METs) than PE lessons with a less favoured content (athletics and gymnastics) is also apparent in the social and relational dimensions (Fig. 3 and 4). A significant increase in the evaluation of PE classes with a favoured content in the social and relational dimensions compared to the lowest and the highest PA intensity ranged between 16–19% ($p < 0.01$; $d = 0.61–1.07$). Figures 3 and 4 pointed out the decrease in the positive evaluation of PE lessons with athletics and gymnastics with a higher PA intensity. The comparison of the evaluation of PE lessons with athletics and gymnastics content between the lowest and the highest PA intensity in the social dimension shows a decrease in 16% and 24% ($p < 0.001$; $d_{athletics} = 1.07$ and $d_{gymnastics} = 1.28$) and in the relational dimension in 25% and 30% ($p < 0.001$; $d_{athletics} = 1.27$ and $d_{gymnastics} = 1.43$).

Based on the data from the Assessment of Physical Education Lessons Questionnaire and the analysis of the individual dimensions, the lowest variability in the evaluation of PE lessons with different content in relation to PA intensity was in the health dimension (Fig. 5). Figure 5 shows that higher PA in PE lessons with a favoured content is not negatively reflected in the evaluation in the health dimension. In PE lessons with athletics and with a higher PA intensity, the percentage decrease of the evaluation in the health dimension is not statistically significant. PE lessons with gymnastics and higher PA (5.1–5.5 METs) are evaluated more negatively ($p < 0.001$; $d = 1.11$) than with lower PA intensity (< 3.5 METs).

Fig. 3
Evaluation of Physical Education lessons in the social dimension of the questionnaire (% of positive answers) according to intensity of physical activity (METs)

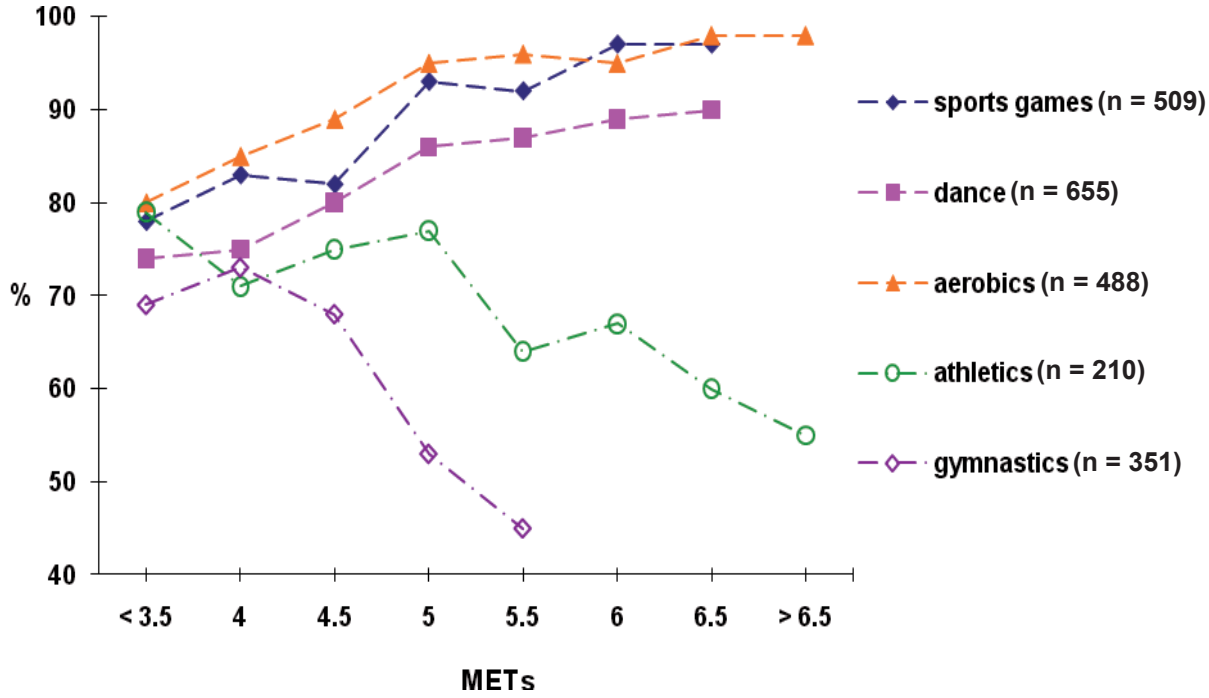


Fig. 4
Evaluation of Physical Education lessons in the relational dimension of the questionnaire (% of positive answers) according to intensity of physical activity (METs)

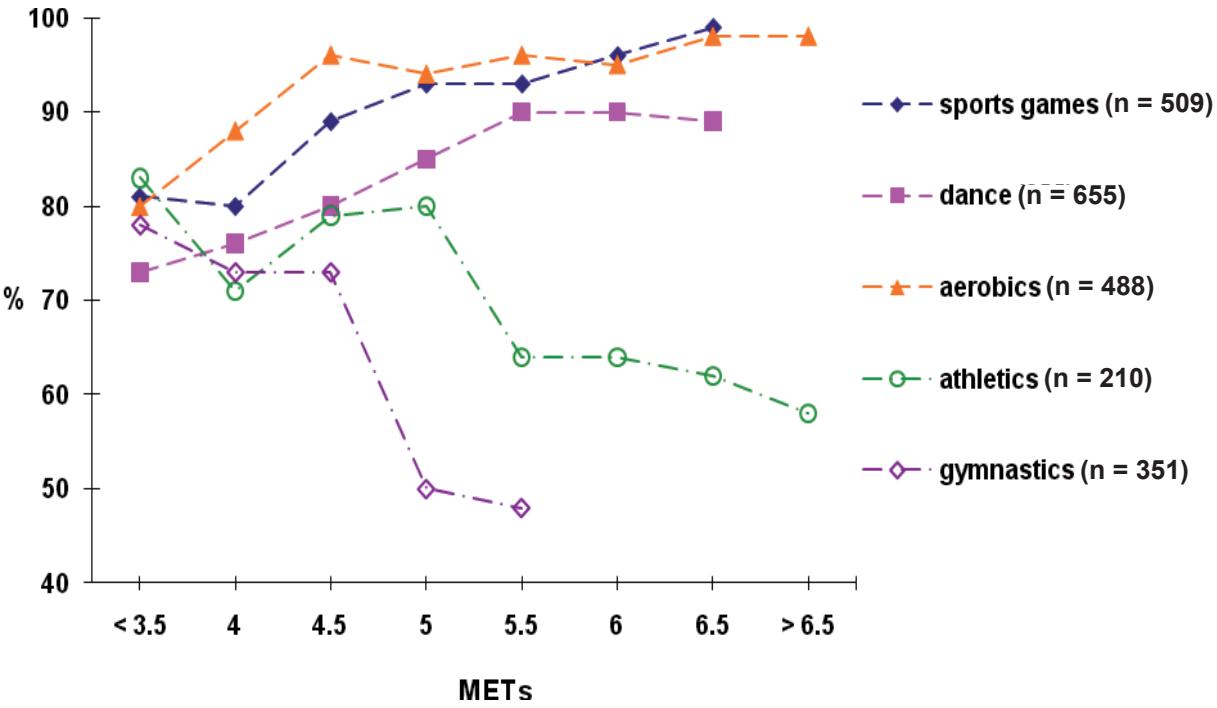
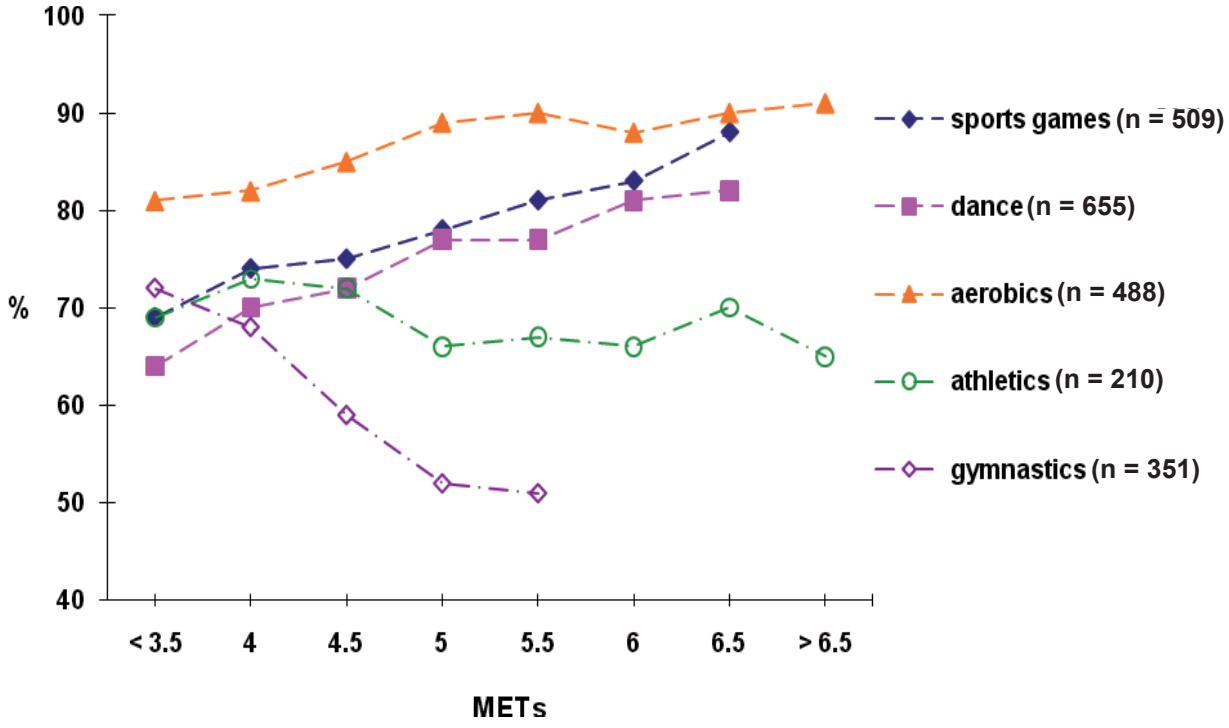


Fig. 5
Evaluation of Physical Education lessons in the health dimension of the questionnaire (% of positive answers) according to intensity of physical activity (METs)



DISCUSSION

The main aim of the study was to identify the relationships and the determinants in the evaluation of physical education lessons with different content in relation to PA intensity. Previous studies describing PA levels in girls in PE lessons as related to the evaluation of the lessons show that higher PA intensity in dance lessons and volleyball lessons was not evaluated negatively by girls (Frömel, Lehnert, & Vašendová, 2000; Pelclová, Frömel, Skalik, & Stratton, 2008; Vašíčková, 2002). However, these studies deal with the discussed relationships only in the cases of aerobic, dance and volleyball PE content. And the classification of the intensity of PA was done subjectively, according to the perceptions of girls, not objectively by accelerometry. Moreover, PE lessons with aerobics and step aerobics with "extreme" PA intensity were evaluated by the girls (n = 112) very positively (> 79% of positive answers in the emotional dimension, 92% in the health dimension and > 97% in the relational dimension) (Vašendová, Valouch, & Frömel, 2001). The "extreme" physical intensity of aerobics (or step aerobics) was an average PA intensity of 6 METs (or 5.7 METs) measured by a Caltrac accelerometer, the average heart rate was 154 beats/min. (or 166 beats/min.) measured by the Polar Vantage heart rate monitor and 4470 steps/45min. (or 4229 steps/45min.) measured by the Omron HJ-102 pedometer.

Similarly, positive evaluation (around 70% of positive answers, such as in Vašendová, Valouch, & Frömel, 2001) was found in all analyzed groups of PE lessons with lower PA intensity – up to 4.5 METs. We can argue that PE at schools is still among girls' favourite subjects, but its "conditioning" or "training" types of content are not popular with girls. A wide range of activities offered in PE classes, altering activities with higher and lower PA intensity during a lesson, replacing routine types of activities with games can make the less favoured content of PE more attractive.

Girls prefer activities focused on speed and agility to activities focused on endurance (Frömel, Novosad, & Svozil, 1999). However, the results of our study show that the development of endurance can depend on the fondness for the physical activity. The higher PA intensity in PE lessons with athletics (> 6.5 METs ≈ long distance run, Ainsworth et al., 2000) received, in all dimensions of the questionnaire, a worse assessment than PA with the same intensity, but in PE lessons with aerobics. Therefore, aerobics is suitable for being applied when developing endurance in girls.

A high preference for aerobics, dance and other types of PA with music should not, however, completely replace athletics and gymnastics in PE lessons. The desire to provide a variety of activities in PE lessons needs to be preserved, since PE lessons are the only source of professionally managed physical activities for

many adolescents (Sigmundová, 2005). Due to a wide variety of activities that are not connected with physical activity that present day adolescents can do, it is essential to enhance pupils' attitude and motivation for doing PE and to enhance their responsibility for their own educational results (MŠMT, 2001). Therefore, even less favoured types of PA need to be made accessible to pupils. An example of such an approach in PE lessons with the focus on endurance, where elements of gymnastics and athletics are applied (crawling, climbing wall bars, hurdle drills with, e.g. benches, jumping on a minitrampoline, doing a forward roll). New sport disciplines such as "Parkour" and "Bouldering" employ elements of gymnastics and athletics and they could be applied in PE lessons to some extent. On the basis of our findings we regard our hypotheses below to be correct:

1. *In PE lessons with a favoured content, higher intensity of physical activity is not reflected negatively in the evaluation of the lessons by girls.*
2. *In PE lessons with less favoured content, higher intensity of physical activity is reflected negatively in the evaluation of the lessons by girls.*

Limits of the study

There was not more detailed information about the physiological and psychological state (e.g. present physical fitness, mental state) of the monitored participants available; therefore it was not possible to exactly identify the level of PA intensity at which an apparently different evaluation of PE lessons with different content appeared. Further, the management of the lessons with the same content using different teaching methods can lead to different perceptions and evaluations of the lessons (Cothran, Kulinna, & Ward, 2000; Dobrý, 2007). Therefore, another limit of the study is the missing information on the influence of the teaching style, despite the fact that it is to some extent described in the social dimension of the questionnaire.

CONCLUSIONS

1. In PE lessons with favoured content, a higher intensity of physical activity was reflected positively by girls in the evaluation of the lessons. Therefore, contents that are favoured by girls, such as dance, aerobics, and sport games, are to be applied if we want to carry out physical activity with a higher intensity.
2. In PE lessons with a less favoured content (athletics and gymnastics), a higher intensity of physical activity is reflected negatively by girls in the evaluation of the lessons. Therefore, classes with such content are not the right ones when we want to increase PA intensity in girls. Making games the main part of a lesson's content or using different teaching techniques can make PE lessons with a less favoured content more attractive to students.
3. To monitor PA in a larger sample of participants with only a few entry characteristics (e.g., body weight and height, age, sex), accelerometers are better devices to measure PA intensity than pedometers or heart rate monitors.

ACKNOWLEDGMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) "Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes".

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OBLÍBENÁ NÁPLŇ VYUČOVACÍCH JEDNOTEK TĚLESNÉ VÝCHOVY – DÍVKAMI POZITIVNĚ HODNOCENÝ PROSTŘEDEK K DOSAHOVÁNÍ VYŠŠÍ INTENZITY POHYBOVÉ AKTIVITY

(Souhrn anglického textu)

VÝCHODISKA: Školní tělesná výchova (TV) je v kontextu výchovy k pohybově aktivnímu a zdravému životnímu stylu jednou z klíčových determinant. Školní TV má dlouhodobě možnost formovat pozitivní postoje dětí k pravidelné pohybové aktivitě (PA) a realizovat ji v pestré škále jejích druhů, intenzit a didaktických forem.

CÍLE: Cílem této studie je prezentovat vztahy a formulovat determinanty při hodnocení obsahově různých vyučovacích jednotek TV vzhledem k intenzitě PA děvčat.

METODIKA: Ke zjišťování vztahů mezi intenzitou PA ve vyučovacích jednotkách TV a jejich hodnocením byla použita data od 2 213 děvčat ve věku 13–17 let monitorovaných ve 205 obsahově různých vyučovacích jednotkách TV (aerobik n = 35, atletika n = 30, sportovní gymnastika n = 33, sportovní hry n = 61 a tanec n = 46) v letech 1997–2003. Intenzita PA byla zjišťována akcelerometrem Caltrac (METs/45min.). K hodnocení vyučovacích jednotek TV byl použit standardizovaný Dotazník k diagnostice vyučovací jednotky TV (% kladných odpovědí v dimenzi emotivní, sociální, vztahové a zdravotní).

VÝSLEDKY: U oblíbeného obsahu vyučovacích jednotek TV dívek (tanec, aerobik a sportovní hry) se vyšší intenzita PA projevila pozitivně v jejich hodnocení vyučovacích jednotek. U méně oblíbeného obsahu vyučovacích jednotek TV dívek (atletika a sportovní gymnastika) se vyšší intenzita PA projevuje negativně v jejich hodnocení vyučovacích jednotek.

ZÁVĚRY: Vyučovací jednotky TV s oblíbeným obsahem (tanec, aerobik a sportovní hry) jsou pro děvčata vhodnými prostředky pro realizaci PA s vyšším tělesným zatížením. Zařazení pohybových her či herní forma vedení může zatraktivnit vyučovací jednotky TV s méně oblíbeným obsahem.

Klíčová slova: aerobik, tanec, sportovní hry, gymnastika, atletika, METs.

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ANALYSIS OF MOTIVES FOR MENTORING STUDENTS IN PRACTICAL PEDAGOGICAL TRAINING

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Submitted in January, 2010

BACKGROUND: The main goals of the renovation of study programmes were, in the majority of the EU member states, the unification and conversion of programmes that will enable the development of the EU into one of the strongest knowledge based societies. Modern study programmes emphasise the interconnection of practice and theoretical principles, which students acquire during their studies; therefore, practical training is one of the most important key parts of all study programmes. Consequently, an efficient system of competent and quality mentorship plays an important part, as mentors prepare individuals for entering the job market by developing their specific competencies in an authentic environment.

OBJECTIVE: As many European Union member states have not yet established a system of competent and quality mentorship, the study presents a system of measures for increasing the motivation of teachers for mentoring students and achieving a better quality of mentorship. The study examined motives for mentoring students in practical pedagogical training.

METHODES: The research included 62 teachers, who mentored students of the Faculty of Sport. The questionnaire used included 26 different motives. Descriptive statistics and factorial analysis were used for data analysis.

RESULTS: It has been revealed that mentors decide to mentor students during their pedagogical training in order to develop their own professional competencies and to further their career – to climb the professional ladder by acquiring additional points needed for advancing in the direction of a higher title. Both reasons result in a higher "status" in the work environment.

CONCLUSIONS: It has been found that in future, a model of partnership cooperation should be established between the Faculty of Sport and mentoring schools; certain measures should also be introduced, facilitating higher motivation of mentors to carry out mentoring. Such measures would influence the practical pedagogical training of students to improve its quality and promote realistic preparation for working in a real work environment.

Keywords: Practical pedagogical training, mentorship, motivation, physical education.

INTRODUCTION

The process of the renovation of study programmes has by now been completed in the majority of the European Union member states. The main purpose of renovation was, in addition to creating standardised programmes, also their modernisation. Both measures should facilitate the development of the European Union as one of the strongest knowledge based societies (Bologna declaration, 1999; Education and training in Europe, 2002; Key competencies, 2002; Lisbon European Council, 2000; A program of lifelong learning, 2006), which has also been one of the starting points of the Lisbon strategy (Lisbon European Council, 2000). In addition, it is important that an individual, during his/her studying years, acquire professional competencies as quickly as possible and then enter the job market. Therefore, practical training for work with an efficient system of competent and quality mentorship holds a special importance in the renovated study programmes.

Mentoring is a process of guiding and leading an inexperienced individual by giving him/her advice and explanations. In the field of educational studies, a mentor is an experienced teacher, who guides and leads either a student in practical training or a teacher trainee in his/her apprenticeship.

A mentor represents a model of a good teacher, holding simultaneously an advisory role that will help the protégé to plan and put into practice lessons in the pedagogical process.

A similar view on mentorship can be seen in a traditional model (Koopman, 2004; Korber, 2004; Van Emmerik, Baugh, & Euwema, 2005), where the more experienced partner in a relationship (mentor) protects a colleague with little or no experience (protégé) in a dyadic relationship. This model has researched mainly the effects of mentorship on the protégé and has ne-

glected the motives of mentors as well as the strategies and contents of the mentoring process.

Van Emmerik, Baugh and Euwema (2005) have reported that, despite various researchers (e.g. Aryee, Cahy, & Chew, 1996; Ragins & Cotton, 1993) warnings as far back as the 1990s about the fact that not everyone who takes on mentoring is suited to be a mentor, only a few research projects have been carried out about the factors influencing the decision to become a mentor.

Van Emmerik, Baugh and Euwema (2005) have researched the factors that influence the *desire* and *decision* to become a mentor in working organisations. They have found that the most important factor is a desire to develop one's own career. In addition, they have found that individuals, who feel strongly about belonging to an organisation or profession, do not have any larger desire to become mentors in comparison to individuals with a lesser feeling of belonging. In contrast to expectations, the results have revealed that individuals who strive to develop a social network, wish to become mentors to a lesser extent. Similar findings have been also found by Allen (2003).

Elaine Cox (2000) has researched the influence of motivational factors on the success of mentorship in mentor – volunteers. The motives of future mentors have been formed into three groups, named as an altruistic group (the desire to help and give back what they received), a compensational group (the desire to offer help due to one's own negative experience in a similar situation) and a career group of motives (acquiring additional experience, one's own professional development). The results have shown that the most important mentors are the ones concentrating on their career (approximately 85%); it is interesting to notice that the altruistic type of mentor is successful in less than 50% of the cases, whereas the compensational type of mentor did not prove to be successful at all. According to Cox, mentors concentrating on their own career have set themselves specific goals, are striving to succeed and are consequently more prepared to learn and acquire additional knowledge.

Jurišević et al. (2005) have found, in a sample of 327 Slovenian teachers – mentors from different programme areas and different levels of schools – that mentors perceive their mentoring role in a sense of their own professional development (as a professional challenge, as an opportunity to learn whilst interacting with students, as a process of their own progression). On the average, they have disagreed that the role of mentors is only an additional burden. In addition, the authors have also found a significant statistical correlation between the mentors' evaluation of the efficiency of practical pedagogical training and their understanding of the mentoring role; namely, mentors who see their role more in a sense of their own development value the efficiency of the carrying out of practical pedagogical training more highly. A similar finding can be also seen by Furlong and Maynard (1995), who claim that this has an important effect on the relationship with students and their experience with practical pedagogical training.

Slovenian teacher – mentors experience a certain degree of incompetency in their mentoring role, as there is no specific training available for their role. They have expressed a desire for additional professional training, which would contribute to achieving a higher quality of mentorship in the following areas: the role and responsibility of the mentor, the organisation and carrying out of the practical pedagogical training of students, modern didactic methods and approaches to and communication with students (Jurišević et al., 2005).

One of the activities of Slovenian teachers is also mentoring students. This activity is not "a professional obligation" for teachers. The larger part of the practical pedagogical training of physical education students at the Faculty of Sport is carried out as condensed mentored pedagogical practice under the guidance of teacher – mentors, who are required to hold the title of mentor. This, in the Slovenian educational system means, that they have at least four years of their own teaching experience. Mentored pedagogical practice is being carried out at selected primary and high schools and is considered to be a practical upgrade to theoretical knowledge, which students have acquired in their studies, in laboratory lessons, seminars and while attending practical training sessions. It is considered to be an acquisition of practical experience in authentic situations in order to gain basic professional competencies for the work of physical education teachers under the guidance of teacher – mentors. Therefore the high quality of mentorship is important, as mentors influence the formation of "professional values" with their own approach and example; these values are often crucial for the status of physical education compared to other academic subjects in school. As a result, it is important for teacher – mentors to carry out their work well, to look after their own professional development and to monitor novelties in the professional field. Only in this way a good linking chain between "theory and practice" can be established (Fullerton & Malderez, 1998, quoted in Malderez & Bodoczky, 1999).

As mentorship is not compulsory, the main aim of the study was to find out which systematic measures would ensure a higher motivation of teachers for mentoring students and would also ensure a better quality of mentorship in the practical pedagogical training of students.

METHODS

The study formed part of the project "A model of the practical pedagogical training of students at the Faculty of Sport" (Majerič, Kovač, Strel, & Kolenc, 2007), carried out in 2006/07 at the Faculty of Sport, University

of Ljubljana. The project has been partly financed by the European Social Fund and the Ministry of Education and Sport of Slovenia and has corresponded in contents and timing with the renovation of studying programmes at the Faculty of Sport. The study included 63 mentors involved in the project. Data were collected in June 2007 with the use of a questionnaire (Majerič, Kovač, Strel, & Kolenc, 2007), which has been used for the final analysis of the project.

The questionnaire included evaluation of teachers – mentors about the reasons for mentoring students in practical pedagogical training and evaluation of teachers – mentors about suggested systematic measures, which would increase the motivation of teachers for mentoring work with students and would ensure a better quality of mentorship. A four level measuring scale has been used in evaluation, with one representing the least important statement and four the most important statement.

Data were analysed with the use of the SPSS for Windows statistical programme. Basic indicators of simple statistics and factorial analysis were calculated.

RESULTS

The questionnaire has been returned by 53 out of 64 teacher – mentors, representing 82.8% of all included teacher – mentors in the project. Male teachers represented 49.1 % (N = 26) and female teachers 50.9% (N = 27) of the included subjects; 39.6% (N = 21) of the measured subjects worked in primary school and 60.4% (N = 32) in high school. Of the measured subjects, 86.8% held a university degree, whereas the others held a further education degree. The majority of the measured subjects (37.7%) have worked for over 20 years in the field of education. The proportion of the teachers, employed in education between 6 to 10 years (18.9%), 11 to 15 years (20.8%) and 16 to 20 years (20.8%) is approximately the same. The measured subjects were teaching on average 21.28 hours per week and have been mentoring students for 10.13 years.

An analysis of mean values (TABLE 1) revealed that in teacher – mentors, the most common decisions for the mentoring of students in pedagogical practice are those related to the development of their own professional competencies.

Afterwards, the teachers have evaluated suggestions of systematic measures, which could ensure the higher motivation of teachers for mentoring work and would thus enable a better quality of mentorship. An analysis of mean values (TABLE 2) revealed that all the suggestions have been evaluated with high marks; therefore, only the top six were analysed, whereas the others were studied with the use of factorial analysis. Teachers have evaluated with the highest marks a suggestion for the free of charge once a year participation at a chosen seminar for permanent professional improvement (3.81). Other suggestions revealed that mentors should be released from the administrative work of mentoring to the greatest extent (e.g. forms for the evaluations of students should be as simple as possible, the writing and sending of forms should be done electronically) (3.79); mentorship should be evaluated with more points for progressing in accordance with the Regulation for titles and progression of employees in education in the Republic of Slovenia (3.70); mentors should receive a "special" professional title "student mentor", signed by the Dean of the Faculty of Sport or the Minister for

TABLE 1
Evaluation of reasons for the mentorship of students in pedagogical practice

Reasons	M	SD
Mentoring is professional work that facilitates my own progress.	3.55	0.57
I like to pass on my working experience to younger colleagues and thus help students.	3.49	0.80
I acquire and exchange different information, ideas and answers on professional problems.	3.47	0.61
I can learn some new things from students.	3.43	0.60
Mentoring is professional work that improves my professional competencies.	3.21	0.77
It keeps me informed on novelties in the field of didactics.	3.17	0.87
Mentoring is a responsibility which I accept as a professional challenge.	3.09	0.84
It keeps me in touch with lecturers and their assistants at the Faculty of Sport.	2.55	0.91
I can establish new social and business ties and open the way for new business opportunities.	2.26	0.88
It enables me to gain points in order to achieve a higher title.	1.91	0.95
It allows me to unload, as the student carries out a part of my job.	1.47	0.72

Legend:
M – mean value
SD – standard deviation

Education and Sport in the Republic of Slovenia (3.68); mentors should be allowed free of charge web access to various professional, research or scientific databases of the faculties (3.65) and mentors should be entitled to an additional three days of holiday for training in the field of mentoring students in accordance with the Collective employment contract in education in the Republic of Slovenia (3.64).

A 4 level measuring scale has been used with 1 representing bad suggestion and 4 a good suggestion.

TABLE 2
Evaluation of suggestions of "systematic measures" in order to achieve better motivation of teachers for mentoring work with students and higher quality of mentorship

	M	SD
Mentors should be entitled to once a year free of charge participation at a chosen seminar for permanent professional improvement.	3.81	0.483
Mentors should be released from the administrative work of mentoring to the greatest extent (e.g. forms for the evaluations of students should be as simple as possible, the writing and sending of forms should be done electronically).	3.79	0.495
Mentorship should be evaluated with more points for progressing in accordance to the Regulation for Titles and Progression of Employees in Education.	3.70	0.503
Mentors should receive a "special" professional title "student mentor", signed by the Dean or the Minister.	3.68	0.581
Mentors should be allowed free of charge web access to various professional, research or scientific databases of the faculties.	3.65	0.623
Mentors should be entitled to an additional three days of holiday for training in the field of mentoring students in accordance with the Collective Employment Contract in Education.	3.64	0.623
Mentors should be entitled to feedback about their work from the students whom they mentored in practical pedagogical training (e.g. opinion about their success, etc.).	3.60	0.599
Mentoring schools should receive a "special" title "mentoring schools", signed by the Dean or the Minister.	3.57	0.636
Mentors should be included as professional experts for practical pedagogical training at institutions for further education.	3.55	0.667
Mentors should receive the free of charge mailing of professional literature (e.g. magazines, etc.).	3.50	0.728
Mentors should be allowed to borrow literature from the libraries of further education institutions free of charge also in the afternoons.	3.48	0.727
Mentors should be allowed to enroll in postgraduate courses under better payment conditions.	3.42	0.887
Mentors should be enabled the free of charge development of their professional competencies through e-learning.	3.40	0.689
A universal system of training and licensing of mentors should be created.	3.40	0.793
Special licensing seminars should be organised for mentors in order to be additionally trained for mentorships.	3.36	0.736
Mentors should have access to novelties in the professional field through e-learning.	3.35	0.738
Mentors should have better opportunities for professional cooperation with chairpeople at the university.	3.30	0.668
Mentors should be helped to mutually acquire and exchange various information, ideas, "examples of good practice" and answers to professional problems within the framework of professional symposia (round tables, etc.).	3.25	0.731
Mentors from different further education institutions with pedagogical programmes should have a common web portal, available for accessing data, contents and "examples of good practice" in mentorship.	3.25	0.738
Mentors should have a chance to participate in research projects at suitable further education institutions.	3.23	0.807
Mentors should be able to enter free of charge into an e-learning community of teacher – mentors, lecturers and assistants at the University and students, where they could exchange examples of "good practice".	3.22	0.759
In order to support the mentorship of students (notices, forms, schedules of students, information about novelties, "examples of good practice", diary…), a www.sportflio.si type of e-learning society should be set up as a single web portal for teachers – mentors, lecturers and assistants at the University and students.	3.21	0.689
Experienced mentors should individually train mentors without experience at licensing seminars.	3.21	0.689
A summer school with professional topics should be organised once a year for all mentors of pedagogical further educations.	3.11	0.891

Legend:
M – mean value
SD – standard deviation

Factorial analysis has been used to calculate 8 factors, explaining together 74.60% of total variance. Nevertheless, a dispersed diagram has revealed that an interpretation of 5 factors is more reasonable, together explaining 60.64% of total variance. The first factor explained 28.50% of total variance, the second factor 10.08%, the third factor 8.44%, the fourth factor 8.10% and the fifth factor explained 5.54% of total variance.

TABLE 3
Distribution of the first components, which together explained more than 50% of the total values

Factors	Initial value		
	Total	% of variance	Cumulative %
1	6.832	28.468	28.468
2	2.419	10.081	38.549
3	2.028	8.449	46.999
4	1.944	8.102	55.100
5	1.329	5.539	60.639
6	1.223	5.095	65.734
7	1.109	4.619	70.353
8	1.018	4.243	74.597

TABLE 4
Factorial distribution of first components with Kaiser's Varimax normalisation

"Systematic measures"	Factors				
	1	2	3	4	5
A universal system of training and licensing of mentors should be created.	.779	–.164	.293	.228	–.150
Mentors should receive free of charge mailing of professional literature (e.g. magazines, etc.).	.688	.370	.143		
Mentors should be allowed to enroll in postgraduate courses under better payment conditions.	.683		.150	–.109	.225
Experienced mentors should individually train mentors without experience at licensing seminars.	.675	.195	.127	.120	.116
A summer school with professional contents should be organised once a year for all mentors of pedagogical further education.	.606	.296	.111	.113	
Special licensing seminars should be organised for mentors in order to be additionally trained for mentorship.	.597	.203		.546	
Mentors should be released from administrative work with mentoring to the greatest extent (e.g. forms for the evaluations of students should be as simple as possible, the writing and sending of forms should be done electronically).	.510		–.455	–.289	.124
Mentors should be able to enter free of charge into an e-learning community of teacher – mentors, lecturers and assistants at the University and students, where they could exchange examples of "good practice".	.457	.406	.169	.404	–.203
Mentors should be enabled the free of charge development of professional competencies through e-learning.	.201	.790		.211	–.100
Mentors should be allowed free of charge web access to various professional, research or scientific databases of the faculties.		.782	.294	–.186	.208
Mentors should have better opportuniities for professional cooperation with chairpeople at the university.		.701	.234		
Mentors should be allowed to borrow literature from the libraries of further education institutions free of charge also in the afternoons.	.446	.661		–.193	.263
Mentors should have access to novelties in the professional field through e-learning.	.374	.592			–.424
In order to support the mentorship of students (notices, forms, schedules of students, information about novelties, "examples of good practice", diary…), a www.sportflio.si type of e-learning society should be set up as a single web portal for teachers – mentors, lecturers and assistants at the University and students.	.190	.506	.354		
Mentors from different further education institutions with pedagogical programmes should have a common web portal, available for accessing data, contents and "examples of good practice" of mentorship.	.271	.157	.831		

Mentoring schools should receive a "special" title "mentoring schools", signed by the Dean or the Minister.	.293		.724		.193
Mentors should have a chance to participate in research projects at suitable further education institutions.	.329	.257	.616	–.148	
Mentors should be helped to mutually acquire and exchange various information, ideas, "examples of good practice" and answers to professional problems within the framework of professional symposia (round tables etc.).		.443	.531	.354	–.135
Mentors should be entitled to feedback about their work from the students whom they mentored in practical pedagogical training (e.g. opinion about their success, etc.).	–.115	.268	.365	.153	
Mentors should be entitled to an additional three days for training in the field of mentoring students in accordance with the Collective Employment Contract in Education.			.270	.680	.233
Mentorship should be evaluated with more points for progressing in accordance to the Regulation for Titles and Progression of Employees in Education.		.123	.117	–.646	
Mentors should receive a "special" professional title "student mentor", signed by the Dean or the Minister.	.162			.166	.729
Mentors should be included as professional experts for practical pedagogical training at institutions for further education.		.440	.124		.713
Mentors should be entitled to once a year free of charge participation at a chosen seminar for permanent professional improvement.	.352	.311	–.153	.223	–.456

DISCUSSION

It has been found that teachers carry out mentorship as they can also progress themselves in addition to professional work with students; simultaneously they acquire and exchange various information, ideas and gain answers to professional problems, they also admit to learning new things from students. In a high second place has been an altruistic motive – they pass on their working experience to younger colleagues and thus help students. The findings are similar to those in the study by Jurišević et al. (2005), conferring that Slovenian mentors perceive their mentoring role mostly in a sense of their own professional development.

The reasons observed are a positive encouragement for the future, as the findings of some researchers (Cox, 2000; Van Emmerik, Baugh, & Euwema, 2005) indicated that mentors with predominant motives of own professional development are also the most successful at their work.

In any plans for establishing a system of better mentoring of students in practical pedagogical training, it would be wise to include the findings of the present study, which revealed that reasons related to rewarding in the sense of the acquisition of additional points for progressing towards titles or earning additional days for permanent professional development are highly important. These measures are already to a certain extent defined in the Law on organising and financing education (Official gazette no.16/2007) and in Regulations about the promotion of professional titles in education (Official gazette no. 54/2002). Teachers also wish to acquire licenses, which would offer them higher "status" in their working environment.

It can be concluded (similarly to Van Emmerik, Baugh, & Euwema, 2005) that additional professional training as a systematic measure has been rated the highest. Similar results have been found by Jurišević et al. (2005): mentors have expressed a desire for additional professional training, which should also contribute to achieving a higher quality of mentorship. In accordance with the Collective working contract in education in the Republic of Slovenia (1994), all the teachers in Slovenia have 5 days a year available for permanent professional improvement. The results of the study show that teachers wished more days were available for professional improvement in the field of mentoring.

As mentorship in Slovenia is not compulsory, the factor analysis has given us some other important answers to the main question "which systematic measures would ensure the higher motivation of teachers for mentoring students and would also ensure the better quality of mentorship in the practical pedagogical training of students".

It can be seen that the first and most important factor explained almost a third of the total variance. This factor was represented with variables, related to the establishing of mentor licences and to mentors' professional growth. Variables included measures such as training to become a mentor, cheaper postgraduate studies and the introduction of modern approaches to the realisation of practical pedagogical training, such as an e-learning society, where examples of good practice could be exchanged with other mentors. The second factor was represented mainly by the variables of encouragement in the working environment, which are related to the sources of the improvement of professional competencies (literature, free internet access, cooperation with further educational institutions, establishing an e-learning society for the purpose of offering support in the realisation of practical pedagogical training), and to enablethe monitoring of novelties in their professional field.

The third important factor was defined by means of networking elements, as it included both the possibilities for cooperation in research projects, the organisation of professional meetings and the assurance for feedback information about mentoring work.

The fourth factor could be named "progress in one's professional career" and was represented by two variables, related to the changes in legislature which would enable mentors to gain an additional three training days for mentorship and would also award mentors more points, needed for promotion.

The fifth factor was represented by variables, apparently giving mentors a "special" status, which would separate them from other teachers, for example with a professional title of "student mentor" or their formal inclusion in practical pedagogical training as expert colleagues as well as free of charge participation at chosen seminars for permanent professional development.

On the base of factor analysis results and the similarity of factors it can be seen that the first 40% (the first and second factors) of variance, ensuring the motivation and quality of mentoring students in practical pedagogical training, are related to possibilities for the improvement of professional competencies. The next 30% (the third, fourth and fifth factors) are related to networking and providing additional professional benefits, to which mentors would be entitled in comparison to other teachers, awarding teacher – mentors in their working environment a "special status" (e.g. a good reputation).

The limiting factor of the present study needs to be considered; namely, the majority of variables were directed towards systematic measures, which can be fulfilled whilst respecting the current legislature or else can be fulfilled by the Faculty of Sport. Therefore, variables which cover various areas, from personal motivation to various possibilities for the development of professional competencies and rewarding, were not balanced. Considering this, the factors were probably not consistent; however, together with the evaluation about the reasons for mentorship in practical pedagogical training, they provide that insight into systematic measures, which could improve the motivation of teacher – mentors for taking up mentorship. These measures would consequently increase the quality of the practical pedagogical training of students.

When discussing setting up a system of competent mentorship in the field of the practical training of future physical education teachers, personal factors, such as altruism, also need to be considered. It is safe to expect that a relationship between input and output also has an effect on a decision. The input is usually the time, knowledge and energy which a mentor has to invest into the mentoring relationship as well as potential additional training. Output mainly comes as personal satisfaction and higher self respect, better career possibilities (e.g. promotion or additional days for permanent professional improvement), professional growth, meeting new people and networking. If the expected input is larger than the expected output, it can be assumed that teachers will not decide to become mentors.

CONCLUSIONS

On the basis of the results of the present research, it can be concluded that in the future a model of mentorship should be formed in such way as to recruit teachers, who would be personally engaged and would consider mentorship to be a certain professional challenge and not as more additional work. Such teachers should undergo training in order to carry out mentorship, thus gaining a license for mentoring. The main purpose of such training would be spreading information about the novelties in the field of studies, linking theory and practice as well as training in the use of informational communication technology in the realisation of lessons and mentorship.

Mentorship should also be set up in such way as to demand as little administrative work as possible, in support of mentoring all the necessary information (instructions, forms, additional information for development of competencies in mentorship, access to literature and databases) should be provided. Some data showed (Majerič & Kolenc, 2007) that an e-learning society for the development of professional competencies would serve the latter purpose and offer support to the realisation of practical pedagogical training. It would be sensible to introduce a slightly reduced workload (e.g. 4 hours per week) as a systematic measure, as this would also result in new jobs available for fresh graduates, who find work with difficulties.

As the volume of practical pedagogical training at the Faculty of Sport has increased after the Bologna reform of studying programmes, the model of practical pedagogical training will in future have to be built on the systematic selection of mentoring schools and mentors, who will be prepared for partnerships, resulting in a mutual endeavour for cooperation of theory and practice. Namely, mentors have to know not only the characteristics of education, the demands and type of work of educational institutions (Cox, 2000), they have to also understand and internalise their mentoring roles (Louden, 1992; Korthagen, 1993). On the other hand, teacher – mentors are an important source of information for educational institutions about the good and bad aspects of the organisation of practical pedagogical training and the quality of studying programmes. Therefore, the cooperation has to be complementary, resulting in a partnership (Carroll, 2005).

It can be assumed that the findings of the present study will be useful also for other universities and further education institutions of European Union member states.

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ANALÝZA DŮVODŮ K MENTORINGU STUDENTŮ BĚHEM PEDAGOGICKÉ PRAXE

(Souhrn anglického textu)

VÝCHODISKA: Hlavním cílem inovace studijních programů ve většině členských států EU byla unifikace a modernizace těchto programů, která umožní rozvoj EU v jednu z nejsilnějších znalostních společností. Moderní studijní programy zdůrazňují vzájemné spojení teoretických principů, které si studenti osvojují během studia, s praxí z toho důvodu, že praktická příprava je jednou z nejdůležitějších částí všech studijních programů. Rovněž účinný systém kvalitních a kompetentních školitelů má významnou roli. Tito školitelé připraví jedince ke vstupu na trh práce právě rozvojem jejich specifických dovedností v autentickém prostředí.

CÍLE: Z toho důvodu, že mnoho členských států EU ještě nevytvořilo systém kompetentních a kvalitních

školitelů, prezentuje tato studie systém opatření k růstu motivace učitelů pro školení studentů a lepší kvalitu školitelské činnosti. Studie zkoumá motivy pro školení studentů v praktické přípravě.

METODIKA: Výzkum zahrnoval 62 učitelů, kteří vyučovali na Fakultě sportu v Ljubljani. Použitý dotazník obsahoval 26 různých motivů. Pro zpracování dat byla využita deskriptivní statistika a faktoriální analýza.

VÝSLEDKY: Výsledky ukázaly, že školitelé školí studenty v pedagogické praxi za účelem rozvoje svých vlastních profesních dovedností a z důvodu kariérních motivů – profesní postup v hierarchickém žebříčku získáváním dodatečných bodů umožňujících postup na vyšší profesní úroveň. Oba tyto důvody znamenají vyšší profesní postavení v pracovním prostředí.

ZÁVĚRY: Bylo zjištěno, že by bylo potřeba vytvořit model partnerské spolupráce mezi fakultou sportu a vzdělávacími školami a prostřednictvím vhodných opatření zajistit větší motivaci školitelů k výkonu jejich školitelské činnosti. Tato opatření by ovlivnila lepší kvalitu praktické pedagogické přípravy studentů při práci v reálném pracovním prostředí.

Klíčová slova: praktická pedagogická příprava, školení, motivace, tělesná výchova.

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Education and previous work experience

Since 1999 employed at the Department of Didactics of Physical Education in Schools at the University of Ljubljana, Faculty of Sport, where he completed Ph.D. in 2004 with a dissertation on the "Analysis of assessment models of sports knowledge in physical education". Working on the modern approaches to lifelong learning experience and permanent expert training of teachers and professionals in sport, he is a Head of the Centre for Lifelong Education in Sport at the Faculty of Sport and a Coordinator of Practical Pedagogical Training of the students at the Faculty of Sport. In 2006 and 2007 he has successfully competed the project "A model of the practical pedagogical training of students at the Faculty of Sport", which has been in part financed by the EU European Social Fund and the Ministry of Education and Sport of Republic of Slovenia. Within the project the first e-learning community Sportfolio.si, intended for the lifelong learning of teachers and students in Slovenia, has been set up. Sportfolio.si is based on an open method of adjustment, which the European Council in Lisbon (2001) defined as a way for expanding examples of good practice, which makes possible the fulfilment of strategic goals in the area of education and training in the EU until 2010. He is a member of the Programme Board for Further Education and Training of Professional Workers in Education in the Republic of Slovenia.

Scientific orientation

Recently, he has been researching knowledge management and modern approaches to lifelong learning in the field of sport, as well as the exchange and development of knowledge in the "society of knowledge".

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PRESENT ATTITUDES OF PHYSICAL EDUCATION STUDENTS TOWARDS FUTURE EMPLOYMENT IN THEIR PROFESSION

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Submitted in April, 2009

OBJECTIVE: The aim of the research was to examine empirically the attitudes of physical education students towards their future profession in physical culture and some of their considerations about the choice of their field of study and their opinion about the course of studies.

METHODS: The research embraced physical education students studying at the Academy of Physical Education in Cracow. The research took place in two stages (May 2005 and 2008). The first part involved first year students (N = 162), the second the same students then being fourth year students, but only those, who passed all semesters on time (N = 103). The students' attitudes towards their future profession were examined by means of a questionnaire worked out by Grabowski and Skrzypiec.

RESULTS: For 45.6% of our respondents the choice of their field of study and prospective profession was determined by positive factors. More than half of the tested students (51.6%) chose physical education as their field of study because of their interests and passion. Salary, stability and terms of work are also significant factors. More than half of the respondents declare their willingness to work in their profession after graduation.

CONCLUSIONS: From among the values preferred while choosing the physical educator's profession, passion was the main choice of the respondents, regardless of gender. The fact that their studies' positive influence on the respondents' attitudes towards their future profession decrease clearly between the first and the last year of studies, is alarming. It would be advisable to do more detailed research in other schools to verify the educational system and the practical preparation of prospective physical education teachers.

Keywords: Motives, studies, teachers' profession.

INTRODUCTION

Choosing their future profession, people, in most cases, decide by motives, normally not just one motive, but a whole group of them. Motives as defined by Duraj-Nowakowa (1984) "are some kind of expression showing one's attitude towards a profession, and also an estimation of one's own possibility to fulfill it". A good choice will depend on a unity of talents, predispositions and interests of the candidate with the profession's requirements (Cieśliński, 2005). The present economic situation and social convictions have caused the fact that the common values preferred while choosing a profession are material profits and stability of work. This opinion is absolutely consistent with Pemmer (2009), who in addition mentions the possibility of one's creative development.

The choice of one's profession and the linked education should be a thoroughly thought out decision, because a wrong choice can bring problems during studying and in later professional work. Research results show, that not well-thought-out decisions are mostly caused by young peoples' lack of knowledge about professions and by inadequate skills to estimate their own abilities and predispositions useful in professions (Duraj-Nowakowa, 1995).

One reason for failure in the choice of one's main subject are different educational chances: "students (in particular differences in interests, motivation, aspirations, health, etc.), their parents (who are different in education, financial situation, educational awareness, professional prestige, etc.), schools (differences in the grades of educational functions, professional orientation, technical infrastructure, social infrastructure, etc.) childhood background (differences in ecological factors, social and cultural skills, the status of the local community for realizing one's educational aims, etc.)" (Duraj-Nowakowa, 1995).

A simplification in making such important decisions about education, profession or work is to take part actively in professional orientation. Expansion of knowledge is desirable or rather necessary. In the opinion of Duraj-Nowakowa (1995) "factors that cause a change for the right orientation in different professions are knowledge about professions, knowledge of the psychophysical requirements linked with different professions,

information about the demands of employees in special job groups, knowledge of ways of how to get a job, skills to evaluate oneself for doing a certain kind of work, etc.". According to other authors, one's choice of profession depends on social influence, e.g. family and living conditions, which is the factor that affects us first and most (Beknie, 2006; Heim, 1996; Pemmer, 2009).

There are also those kinds of opinions, that young people decide (by themselves) about where to study at the last possible moment, accidentally, and that parents, teachers and job councelling centers do not play a role in their making this decision (Depta, 1992; Szczepański, 2005).

These considerations show the need for analyzing students' attitudes (in this case physical education students) towards their future profession and their motives for choosing the teacher profession. This special profession requires from its candidates definite characteristics – love of children, emotional stability, empathy, self acceptance, reliability, creativity, etc. (Grabowski, 2000).

The aim of the research was to verify empirically students' attitudes towards their future profession in physical culture and some reasons for choosing their field of studies and their opinion about their studies. The analysis of this aim was made after gathering information on the topic and getting answers to the following questions:

1. Which factors decide about the choice of physical education as a field of studies in the students' opinion?
2. Did the respondents' idea of what their studies would be like change during the course of their study program during their time at the academy and how much were the study programs similar to their expectations?
3. What kind of influence does the time of studying have on their attitudes towards their future profession?
4. What kind of work are physical education students interested in after graduating?
5. Which values do students prefer while choosing the physical education teacher's profession?
6. Do the mentioned categories of questions diversify the respondents depending on gender and year of studies?

METHOD

The research was done in two stages. The first involved all first year students (N = 162) attending their classes on the research day (May 2005). The second part was done three years later in 2008, the same students (now 4th year students N = 103) took part. The different numbers of respondents in the first and second stage of research can be clarified by the fact, that not all students who started their studies in 2005 were 4th year students in 2008 (TABLE 1).

TABLE 1
Numbers of respondents with details about gender and year of study

Year of studies	Gender	Number of respondents	Total
I	F	80	162
	M	82	
IV	F	50	103
	M	53	

The main research instrument used in our study was a questionnaire with open and closed questions. The questionnaire was worked out according to Grabowskis' and Skrzypiec's publications (Grabowski, 1991; Skrzypiec, 1978).

To check their motives for choosing physical education as field of study and prospective profession, the respondents had to answer an open question. The answers were fairly different, but we could establish that there are two factors responsible for the students' field of study choice. One group of motives are internal, related to the students interests and ideas, such as sports as a hobby or the wish to work with children, etc. External motives are related to the motivation by parents and friends, or the failure in other fields of studies, etc. For a deeper analysis of the results we applied (like Grabowski, 1991) a categorization, which helped to create four groups of motives:

1. Positive – e.g. the wish to work with children, interest in the human being as a field of study, the wish to improve the quality of physical education and sport, the possibility of harmonic physical and psychological development, attractiveness of the prospective work, etc.
2. Ambivalent – positive-neutral or positive-negative, e.g. interest in sport, avoiding the army.
3. Neutral – e.g. motivation by friends, the perspective of long holidays, the wish to continue a sports career, etc.
4. Negative – e.g. reluctance to work in an office, avoiding the army, failure in trying to study other main subjects, etc. (Grabowski, 1991).

The measure of satisfaction in making the right choice of education after graduating from high school was surveyed in two questions:

1. Have your expectations of studying in the physical education academy been met in practice?

2. If you were once again in the position you were in while graduating, would you choose the same major?

The aim of the research was also to get answers to the following question: Did your attitudes towards your prospective profession change during your studies? Did studying change your attitude towards your prospective profession? The respondents had to choose one of the following answers: 1. did not change, 2. from negative to positive, 3. from positive to negative, 4. from neutral to positive, 5. from neutral to negative, 6. I attached more, 7. I got a little discouraged. Finally (as in H. Grabowski's research) three categories of influences on students' attitudes towards their future profession were isolated:

1. positive – answers no, 2, 4, and 6,
2. neutral – answer no. 1,
3. negative – answers no. 3, 5, and 7 (Grabowski, 1991).

Another question to be answered by the respondents was: Where do you want to work after graduating? We wanted to verify the students' attitude towards the teacher profession. After allocating the answers into categories (as did H. Grabowski) we got three possibilities of work: 1. in conformity with their field of studies, 2. other work in physical culture, 3. not in physical culture (Grabowski, 1991). There was also a group of students, who did not know where to work after graduating.

The last question was about the students' preferred values for choosing work. The respondents could choose up to three from eight value categories (set by H. Grabowski) or mention their own (Grabowski, 1991).

To make it easier for other scientists to make similar research projects in future, the authors enclosed a particular description of the research tool.

The basis of working out the results was to define the quantity of answers to the particular questions in numerical data and percentage terms. The strength of the relationship between variables was determined with an adjusted contingency coefficient (C) based on a chi-square test 2. The value of this coefficient was calculated only for those relationships that were statistically significant at the 0.05 level.

The research project was financed by the Chair of Physical Education Theory and Methodology of the Academy of Physical Education in Cracow.

RESULTS

Despite the different responses it was found that the choice of field of studies was clearly determined by two types of factors: Intrinsic factors, more associated with entrenched interests and considerations, e.g. interest in sport, a willingness to work with children, etc., and extrinsic factors, e.g. a failure to be admitted to a different field of studies, an incentive from their environment, etc.

On the basis of the answers presented in (TABLE 2) it was deduced that, for a majority of the students examined (45.6%), the choice of academic education and career was influenced by positive conditions, e.g. the wish to work with children or the attractiveness of the future profession. The diversification of these conditions within genders was slight and amounted to just 1.3%. The reason for this lies in government changes in the last twenty years.

TABLE 2
Consideration of main subject choice in %

Consideration	Year of studies		
	I		
	F	M	Total
Positive	45.0	46.3	45.6
Ambivalent	40.0	46.3	43.2
Neutral	13.8	7.4	10.6
Negative	1.2	0.0	0.6

In the second, a large group of respondents (43.2%) on the question of further education decided based on ambivalent conditions, which means, e.g. an. interest in sports or avoiding military service. Because of neutral (such as encouragement by friends, the perspective of long holidays, the will to continue a sports career) these reasons were almost one in ten of the examined who settled on this major. Among the males examined, no negative conditions were observed. The results of the research proved that the choice of this major for most of those examined was not coincidental, but based on well thought out decisions.

The answers for the consecutive question (in which one could underline more than one answer), where the motives for choosing physical education studies were strictly assigned, it was even more pronounced that the decisions were not made accidentally. The main motive for choosing physical education as field of studies was the interest in and passion for the teacher's profession (51.6%), and next the possibility of doing sports (11.8%) and work with children (11.2%). The values of the mentioned motives were slightly higher within the female group than the males (TABLE 3).

The expectations of their studies (which the respondents had before studying) in confrontation with their later experience in reality were met for 34.1% of students finishing their first year of education (TABLE 4). In this group women were more disappointed then men. At the end of the fourth year of education this percentage de-

TABLE 3
Motives of choosing physical education as main subject in %

Category of answer	Year of studies		
	I		
	F	M	Total
Teacher's/Trainers profession	3.7	6.1	4.9
Interests, passion	53.7	49.4	51.6
Work with children	12.2	10.2	11.2
Dream	4.9	1.1	3.0
Continuing sports career	6.1	3.4	4.8
Development in sports	4.9	5.3	5.1
Sports	12.4	11.2	11.8
I don't know	10.8	9.6	10.2

Legend:
Attention! It was possible to choose more than one answer, so the total can be more than 100%

TABLE 4
Conformity of expectations with reality in %

Category of answer	Year of studies					
	I			IV		
	F	M	Total	F	M	Total
Absolutely yes	28.0	40.1	34.1	32.1	29.8	30.9
Partly yes	68.3	48.4	58.4	62.3	52.6	57.5
A little	2.4	11.5	6.9	5.6	17.6	11.6
Absolutely no	1.3	0.0	0.6	0.0	0.0	0.0

creased slightly to 30.9%. Also gender did not make up any diversification of the examined feelings (F = 32.1%; M = 29.8%). The answers to the second question suggest that the readiness to re-choose the same major significantly diverges from the practical verification of students' expectations about education in confrontation with reality. If those examined had, after high school, chosen once again their further education, almost half of them would have settled on the same major, which is physical education. This kind of answer was given by 57.3% of the first year students and 50.1% after their fourth year of education (TABLE 5). In accordance with gender, little diversity of results in the group of fourth year students was noted (K = 54.7%, M = 45.4%) and extraordinary accordance was noticed within students finishing their first year of studies (F = 57.3%; M = 57.3%).

The presented situation can be explained by the students' motives, which were chosen most – interests and passion (TABLE 3). The analysis of this fact shows that

TABLE 5
Declared readiness to choose the same main subject of studies again in %

Category of answer	Year of studies					
	I			IV		
	F	M	Total	F	M	Total
Absolutely yes	57.3	57.3	57.3	54.7	45.4	50.1
Rather yes	24.4	28.1	26.2	30.2	22.3	26.3
Difficult to say	17.1	12.4	14.8	11.3	14.0	12.7
Rather no	1.2	2.2	1.7	3.8	13.0	8.3
Absolutely no	0.0	0.0	0.0	0.0	5.3	2.6

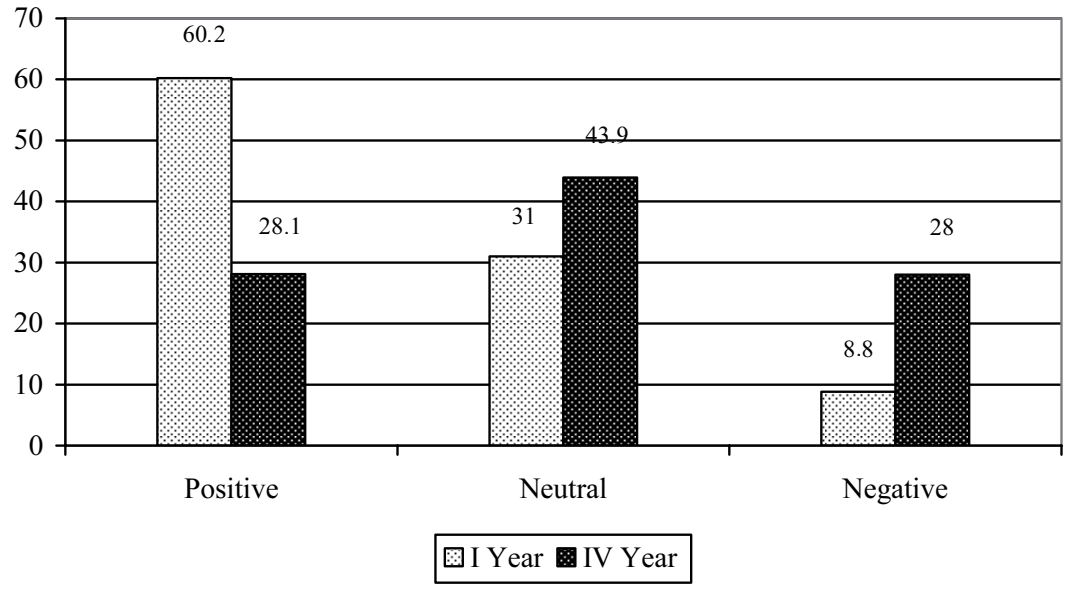
this choice was mainly made by students who are sure about the right choice of their field of study and also show a strong emotional bond to their future profession.

Comparison shows that, in 60.2% of cases, studying has a positive influence on first year students' attitude towards the teacher profession. Unfortunately this result decreases significantly during the four years of studies (28.1%), the percentage distribution shows that the neutral influence is the dominating one (TABLE 6, Fig. 1). In this case there was an average correlation between the effects of studies and the students' attitude towards their future profession ($x^2 = 31.39$; $p < 0.05$; $C = 0.325$). We should search for the reasons for such significant differences between the answers at the beginning and the end of their education in the fact that students' educational experience is growing. The results can suggest a kind of interdependence, which means the higher the year of studies, the smaller the probability of subjective opinions towards the issue. This theory can be supported by the fact that first year students take part in theoretical subjects, which does not give them a deeper insight into their future profession. In later stages their theoretical knowledge is enriched by practical experience. That happens, among others, by taking part in pedagogical practice at schools. So, for having mature and objective opinions, students need that kind of experience. A lack of their studies' influence on their attitudes towards

TABLE 6
The respondents' opinion about the studies influence on their attitudes towards their future profession in %

Kind of influence	Year of studies					
	I			IV		
	F	M	Total	F	M	Total
Positive	59.8	60.6	60.2	26.4	29.8	28.1
Neutral	35.3	26.8	31.0	52.8	35.1	43.9
Negative	4.9	12.6	8.8	20.8	35.1	28.0

Fig. 1
Studies influence on students attitudes towards their prospective profession – first and fourth year of studies – total



their prospective profession was chosen more often by women than by men, and that was similar throughout first (F = 35.3%; M = 26.8%) and last year respondents (F = 52.8%; M = 35.1%). The situation was in reverse in cases of negative influence.

More than half of the respondents want to work in conformity with their qualifications (TABLE 7). This conviction grows by 16.3% between the first and last year of studies. Depending on the respondents' gender, a larger difference was recorded in women (23.5%) than in the male group (8.9%). The number of respondents declaring willingness to start other work in physical culture decreased by 5.8%, the number of undecided was 12.2%. In the final year of studies, male respondents hesitate more about where they want to work after graduation (26.3%). This situation can be influenced by the high requirements set for teachers and the low salary.

TABLE 7
Preferred kind of work after graduation in %

Kind of work	Year of studies					
	I			IV		
	F	M	Total	F	M	Total
As teacher or coach	59.3	42.0	50.6	82.8	50.9	66.9
Another in physical culture	13.6	12.5	13.1	7.7	7.0	7.3
Not in physical culture	4.9	11.4	8.1	3.8	15.8	9.8
I don't know	22.2	34.1	28.2	5.7	26.3	16.0

Apart from that in recent years there is an explicit tendency towards feminization of the teachers' profession.

The percentage index is shown in preferred values for choosing a profession in TABLE 8. Of the mentioned values for choosing work, passion won the most recognition (regardless of gender and year of study) for the future profession. This relates certainly to (how Grabowski, 1991 says) acknowledged, not realized values. According to our respondents' salary (1st year

TABLE 8
Preferred values for choosing work in %

Value category	Year of studies					
	I			IV		
	F	M	Total	F	M	Total
Passion	89.0	94.4	91.7	100	91.2	95.6
Stability of work	40.2	31.5	35.9	28.3	28.1	28.2
Salary	58.5	64.0	61.3	60.4	64.9	62.7
Social recognition	9.8	7.9	8.9	5.7	14.0	9.9
Terms of work	47.6	41.6	44.6	45.3	38.6	41.9
Free time	15.9	22.5	19.2	15.1	19.3	17.2
Possibility to promote	20.7	15.7	18.2	22.6	14.0	18.3
Attractive city	1.2	3.4	2.3	1.9	0.0	0.9
Others	0.0	0.0	0.0	0.0	0.0	0.0

Legend:
Attention! It was possible to choose more than one answer, so the total can be more than 100%

61.3%; 4th year 62.7%) and terms of work (1st year 44.6%; 4th year 41.9%) are significant. High marks were given to stability of work (1st year 35.9%; 4th year 28.2%) and chances for promotion (1st year 18.2%; 4th year 18.3%). Depending on the year of their studies, the differences in research results progress as follows: fourth year students were convinced about passion, salary, the possibility of promotion and social acceptance. First year students were convinced about the terms and stability of work, free time and the attractiveness of the workplace. The most different values between first and fourth year students were recognized in stability of work (7.7%), the least in the possibility of promotion. According to gender in both years of studies, the higher values concern women, the lower concern men. The highest and least differences between female and male respondents' values were recorded among fourth year students. The highest difference refers to passion (8.8%), the lowest to stability of work (0.2%). It is important to mention that, for all women taking part in the research at the end of their studies, passion is the most important value. On the other hand any male respondent finishing his studies chooses the attractiveness of the workplace as a value. These numbers are considerably higher than in previous research. That means that values got a new meaning after regime changes.

DISCUSSION

At the present time, continuing education after secondary school is generally treated as a natural process. So the decision about studying is not seen as an extraordinary thing. But the motives of students' field of study choices are noteworthy.

In Polish research (Brojek, 2008; Cieśliński, 2005; Grabowski, 1991; Kosiba, 2003; Madejski & Majer, 2005; Rakowski, 2000; Skiert & Buchta, 2008; Włostowska, Zajkowska-Magier, & Wasilewski, 1999; Wojtaś, 2007) scientists tried to clarify why secondary school graduates want to become physical education teachers. Similar research in this field was done abroad (e.g. Beknie, 2006; Depta, 1992; Dewar & Lawson, 1984; Heim, 1996; Hutchinson, 1993; Pemmer, 2009; Spittle, Jackson, & Casey, 2009; Templin, Woodford, & Mulling, 1982).

However, as we can read in the work of M. Spittle (Spittle, Jackson, & Casey, 2009) they mostly concentrate on the socialization process rather than on motives (Belka, Lawson, & Lipnickey, 1991; Moreira, Fox, & Sparkes, 2002; Richardson & Watt, 2006).

According to M. Spittle "motives for teaching physical education are rarely measured in accordance with the theory of self determination and in spite of its constant development, not many scientists point out those types of motives, that are specific for physical education students" (Spittle, Jackson, & Casey, 2009).

These are mostly different conditions that have an influence on the choice of ones' field of study. Usually positive motives dominate, like the wish to work with children and youths. This result has been confirmed in this research and that of others (Brojek, 2008; Grabowski, 1991; Kosiba, 2003; Spittle, Jackson, & Casey, 2009; Włostowska, Zajkowska-Magier, & Wasilewski, 1999).

To compare the results to H. Grabowski's research which was held in the first phase of political changes in Poland (Grabowski, 1991) a growth of 15.3% of positive motives can be observed. This progress is probably the result of the mentioned changes, which took place over the last twenty years. The thorough reforms of the educational system also had an influence. It includes the reform of the general school system, but also of teachers' education and their promotions. Besides that, the choice of ones' field of studies often depends on individual and long-term interests in the profession.

Results of Austrian research on first year students, made in five universities (in Graz, Innsbruck, Klagenfurt and two in Vienna) partly confirm this relationship. In the opinion of 64.3% of the respondents, their choice of studies was influenced by their interest in the subject, but for the most part (66.4%) the main motive was a good existence in the profession (Depta, 1992).

All research dealing with secondary school graduates' motives for their choice of studies show a great variety of motives. The main motives in this research were interests and passion. The same motive was found in the results of other research projects (Brojek, 2008; Wojtaś, 2007). Motives for choosing physical education studies were, e.g.: fulfilling one's dreams (Wojtaś, 2007), the possibility of further development and acting in sports (Brojek, 2008; Heim, 1996; Pemmer, 2009; Spittle, Jackson, & Casey, 2009; Wojtaś, 2007). Physical education studies were also chosen by people, whose favorite school subject was PE, and those who associate physical education and sports with positive emotions (Heim, 1996; Pemmer, 2009).

In M. Spittles' research the respondents' motives for choosing a physical education academy were the facts, that they would like to work at school and want sports and physical activity to be a part of their work (Spittle, Jackson, & Casey, 2009).

One of the cognitive aspects of our research was to find out how the respondents' notion of studies changed during the years of studies and how their ideas of what it would be like fit in with reality. A little regression between how they imagined it before the beginning of their studies and the end show that the respondent's knowledge about their future studies was incomplete.

Comparing, on the other hand, the results of this research to the results of international research done

in the early nineties, in which students from five physical education academies took part (Budapest, Prague, Sofia, Lviv and Cracow) it turned out, that they are most similar to the results of students from Budapest and higher than results from students from Prague and Cracow (Grabowski, 1991).

Research results show that the motives for choosing a field of study correlate with the motives for choosing the teachers' profession. The respondents in the first place prefer such values as: passion (Grabowski, 1991; Kosiba, 2003), interest in sports and sports passion – 34.8% (Brojek, 2008; Heim, 1996; Pemmer, 2009; Włostowska, Zajkowska-Magier, & Wasilewski, 1999), and the will to work with children and youth (Cieśliński, 2005; Rakowski, 2000). Some of the respondents chose the teachers' profession, because it is known from their school days. In their opinion this knowledge minimizes their fears, which appear while choosing any profession, which is not known to them before they have to decide (Pemmer, 2009).

For present students and teachers, important factors for choosing a profession are also: salary, stability and terms of work (Cieśliński, 2005; Heim, 1996; Kosiba, 2003). A similar structure of these three values was noted in the research of Grabowski in the early 90's (Grabowski, 1991). The values in this present research are higher than before, which means that they got more and more important after recent political changes. Another important value is also the fact of having more free time in comparison with other professions (Heim, 1996, Pemmer, 2009).

The factor of stability of work grows a lot because of the changing situation in the economy and growing numbers of unemployed persons. In H. Grabowskis' research held in the early 90's, stability of work was a preferred value only for 11.1% of students (in total). Besides students from Lviv – 19.1%, the schedule in other Academies was similar: Budapest – 7.6%, Prague and Sofia – 9.2%, Cracow – 9.8% (Grabowski, 1991). Comparing these results with our present students, this factor has grown by almost three times up to 28.2%. For teachers teaching subjects other than physical education, the factor of stability is more important. In G. Kosiba's research as many as 55.1% of the respondents answered this way (Kosiba, 2003).

An interesting fact is that in spite of the long time of studies there is no large difference in the students' preferred kind of work after graduating. More than half of our respondents declared the will to work in their profession in future (TABLE 7; Grabowski, 1991; Madejski & Majer, 2005; Skiert & Buchta, 2008; Wojtaś, 2007). This is probably that group of students, who have stable and definite professional attitudes, who prepare well for their profession, who got good grades and succeed during pedagogical practice at school and whose interests are clearly in common with their future work (Duraj-Nowakowa, 1995).

Certainly a good preparation for work depends on the quality of teachers' education. The quality of work in academies and universities in many European countries has been severely criticized (Prucha, 2003).

CONCLUSIONS

Because this research was carried out in only one academy, the results cannot be used to formulate general conclusions. However, they can be used as advice and inspiration for doing that kind of research in more than one academy.

On the basis of the research results the following conclusions were drawn:

1. The choice of their field of study and prospective profession of most of our respondents was determined by positive factors, like the wish to work with children, interests, possibility of personal development, and the will to improve physical education and sport in our society. These kinds of conditions are recommended and particularly desired in the teachers' profession.
2. It turned out that the respondents' notions before the beginning of studies were definitely similar to reality only for 1/3 of the respondents and partly similar for more than half of them.
3. In the time between the beginning and end of their studies a regression of their studies' influence on students' attitudes was marked. On the other hand, negative influence grew almost three times. It would be important to do more specific research about the reasons for this alarming phenomenon.
4. More than half of the respondents plan to work in their profession after graduating (work as physical education teachers). That confirms the rightness of their decision about their future profession.
5. From the mentioned values, which are preferred while choosing work, passion was the most important, regardless of gender and year of study. Other important values were salary, terms and stability of work.
6. The research results were slightly differentiated by gender in almost all categories of answers. Only in the first year were the same numbers of male and female respondents sure to choose the same studies for another time. Higher percentage terms were noted by women than men. This can be a sign of the greater determination of women's attitudes towards the teachers' profession. Conducting this kind of research is extremely important, not only because of cognitive factors, but also for creating a relevant strategy for recruitment, especially to pedagogical subjects. It is also important to mention that the motives for choosing the teaching profession develop not only during their studies, but also in their first years of professional work. So it would be advisable

to explore the influence of motives on teaching results and also the relationship between motives for studying and motives in the teachers' profession, which is also the subject of other research projects (Moreira, Fox, & Sparkes, 2002; Spittle, Jackson, & Casey, 2009).

It seems that in the present situation a systematical modification of the teacher education system is needed. The conformity to present terms and social expectations are important.

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SOUČASNÉ NÁZORY STUDENTŮ TĚLESNÉ VÝCHOVY NA JEJICH BUDOUCÍ ZAMĚSTNÁNÍ V TÉTO PROFESI

(Souhrn anglického textu)

CÍL: Cílem výzkumu bylo empiricky posoudit názory studentů tělesné výchovy na jejich budoucí zaměstnání v tělesné výchově a některé z důvodů, proč si vybrali tento studijní obor, a jejich názory na průběh studia.

METODY: Výzkum se zabýval studenty tělesné výchovy na Akademii tělesné výchovy v Krakově. Výzkum se konal ve dvou fázích (květen 2005 a 2008). První část zahrnovala studenty prvních ročníků (N = 162), druhá pak tytéž studenty ve čtvrtém roce studia, ale pouze ty, kteří splnili své studijní povinnosti (N = 103). Názory studentů na jejich budoucí profesi byly zkoumány pomocí dotazníku, jehož autory jsou Grabowski a Skrzypiec.

VÝSLEDKY: U 45,6 % respondentů byl výběr studijního oboru a potenciální profese determinován pozitivními faktory. Více než polovina zkoumaných studentů (51,6 %) si tělesnou výchovu jako svůj studijní obor vybrala kvůli svým zájmům a nadšení. Dalšími významnými faktory jsou také plat, stabilita a pracovní podmínky. Více než polovina respondentů vyjádřila svou ochotu pracovat v této profesi po ukončení studia.

ZÁVĚRY: Mezi hodnotami, jež vedly k výběru profese učitele tělesné výchovy, respondenti nejčastěji uváděli nadšení, a to bez ohledu na pohlaví. Znepokojivé je to, že pozitivní vliv, jaký má studium na názory respondentů, pokud jde o jejich budoucí profesi, mezi prvním a čtvrtým rokem studia evidentně klesá. Bylo by vhodné provést podrobnější výzkum v jiných školách, aby bylo možné ověřit vzdělávací systém a praktickou přípravu potenciálních učitelů tělesné výchovy.

Klíčová slova: motivy, studium, učitelská profese.

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THE INFLUENCE OF EARLY INTERVENTION MOVEMENT PROGRAMS ON MOTOR SKILLS DEVELOPMENT IN PRESCHOOLERS WITH AUTISM SPECTRUM DISORDER (CASE STUDIES)

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Submitted in June, 2009

OBJECTIVE: The purpose of the present study was to assess the motor skills performance of preschoolers with autism spectrum disorder after eight weeks of physical activity intervention.

METHODS: Participants included 5 children, 4 male and 1 female, from 62 to 81 months old, who were attending the identical special kindergarten. Both the quantitative and qualitative aspects of the children's performance were examined. With regards to the quantitative examination, participants were measured using the Movement Assessment Battery for Children (Henderson & Sugden, 1992). Qualitative results were obtained through personal observation. Each motor skills intervention program continued for eight weeks, and children were tested in both pre and post intervention phases.

RESULTS: Over the course of the intervention, four of the participants improved their motor skills, while one did not.

CONCLUSIONS: This study concluded that even preschool children with autism can improve their motor and social skills if they are involved in a physical activity at least twice a week. The physical activity program could improve their motor and social skills which could help them in their future development.

Keywords: Intellectual disability, motor development, autism spectrum disorder, Movement Assessment Battery for Children (M-ABC), early intervention.

INTRODUCTION

Children with Autism Spectrum Disorder (ASD) may be at risk for being physically inactive because characteristics of the disability interfere with successful participation in traditional forms of physical activity (Fox & Riddoch, 2000).

Children with ASD demonstrate:

- restricted, repetitive, and stereotyped patterns of behavior, interests, and activities;
- qualitative impairments in social interaction;
- qualitative impairments in communication (American Psychiatric Association, 2000).

These impairments may interfere with a variety of physical activity opportunities, such as riding a bike to school without supervision, playing tag with peers during recess, etc.

The health benefits of participating in adequate amounts of physical activity and the fact that health behaviors are established during childhood are well documented. It is recommended that children engage in more than 60 minutes and up to several hours of moderate to vigorous physical activity per day, 10 to 15 minutes or more in duration (Corbin & Pangrazi, 1999), but it is unclear whether children with ASD are meeting these guidelines.

Since impairments associated with the disability may place individuals with ASD at risk for inactivity, addressing positive physical activity habits early in life could contribute to regular participation in physical activity, which leads to the enjoyment of health benefits and contributes to maximal community participation as an adult.

Taking into consideration the importance of motor skills, as well as the problems that a delay in their development can result in, the necessity for early intervention has been clearly demonstrated (Samouilidou & Válková, 2006). This is also supported by a large number of studies (Casto & White, 1984; Cowden, Sayers, & Torrey, 1998; Guralinick, 1991; Odom, 1988; Orr, 1990; Sayers, Cowden, Newton, Warren, & Eason, 1996; Stedman, 1988; White & Casto, 1985).

This study is focused mainly on the ability of children with autism spectrum disorders to participate in physical activity intervention, the probable results of measurement, the validity of the test battery and changes that will occur over the course of the intervention.

AIM

To identify the level of motor skills improvement which has occurred in children with Autism Spectrum Disorder after eight weeks of intervention in which was used some of the games from the book Purposeful play by McCall and Craft (2004).

METHODS

Participants

Preschoolers were recruited based upon the following criteria: a) diagnosis, b) age, and c) medication. Participants included 5 children, 4 males and 1 female. Diagnoses of Autism Spectrum Disorder were recognized in all cases. The age range was from 62 to 81 months old. The children in this study are from a special public kindergarten, founded in 1991, and located in a middle sized city in the Czech Republic. This kindergarten is a facility for children with special education needs, developmental disorders and developmental delay. The staff there has very good attitudes towards "challenged children" and is specially trained for early intervention. Children with autistic behavior, intellectual disability, communication and social disorders, aged from 6 months to 7 years of age are served there (Samouilidou & Válková, 2007).

Instrument of assessment

The instrument used for the assessment of the motor skills of the children was the Movement Assessment Battery for Children (M-ABC) (Henderson & Sugden, 1992). The selection of the M-ABC was determined using the available characteristics in order to measure partial as well as total motor disability in the motor skills of children from 4 years up to 12 years in different sets. The results can serve in future motor interventions. The M-ABC is a valid and reliable motor test and very important in identifying children with motor impairment, evaluating motor development, and assessing the efficacy of intervention (Henderson & Sugden, 1992). The Harcourt-Assessment Company has granted permission to use their internationally applied test in the Czech Republic for clinical and research purposes.

This M-ABC is developed especially to evaluate mild to moderate motor impairment. The test has a checklist (used for screening children) and a performance test. According to the authors, the test is not time consuming and children are likely to participate in the test. To assess one child with this test it takes from about 20 to 40 min. Standardized guidelines and instructions included in the accompanying manual are followed while administering this test. This ensures that the test is used in a standard way throughout the assessment and that the scores obtained can be reliably compared to those norms obtained by Henderson and Sugden when the battery was created in 1992. Though based on United Kingdom (UK) norms, this battery has been validated for use in many European and Asian countries. As is the nature of any motor assessment, the aim is to replicate the full ability of the child in the assessment context. Due to this, it is important to try and maintain as natural an environment as possible in order for the child to perform. This is very much the case with the M-ABC. The assessment tasks are play like in nature and should lead to full cooperation from the child.

Each task on the M-ABC is scored in either total seconds taken to complete the task, e.g. threading beads, or counting the number of successful attempts out of total trial numbers, e.g. rolling a ball into a goal area. The M-ABC is organized into three domains or performance areas, covering manual dexterity (3 items), ball skills (2 items), static balance (1 item) and dynamic balance (2 items). (Compare appendix.) A special feature of the M-ABC test is the organization into four different age bands for age groups between 4 and 12 years. Children can score between 0 and 5 on each item, so that the total score will range from 0 to 40, with increased impairment associated with higher scores. The Total Impairment Score (T.I.S.) is the sum of all the scaled scores and this is then expressed as a percentile of the norm. For example, T.I.S. of 13+ would indicate that the child lies in the 5^{th} percentile, and is therefore has a very impaired score. For the purpose of this study, the performance test was used. This allows for both quantitative analysis as well as the entering of comments on observations gathered and identified in this study as qualitative data. This manual M-ABC is not still translated into the Czech language, so it was used in the English language. Commands and communication with children were applied in Czech.

Ethical proof

The kindergarten atmosphere is typical, with warm relations between staff and parents. Staff and parents are open to new information as well as to accepting progressive approaches. The staff informed parents briefly about the measurements and the purpose and content thereof. Authors participated in a short meeting with parents. Parents signed the consent letter and asked to receive results and explanations.

Intervention

Preschool children with Autism Spectrum Disorder were involved in physical activities, twice per week, with each exercise lecture lasting for 60 minutes. The intervention program was carried out over a period of eight weeks, which meant 18 exercise lectures in total. The physical activities for this intervention were used from the book Purposeful play by McCall and Craft (2004), in which they introduce Early childhood movement activities on a budget, adapted for Autistic children. One hour (60 minutes) is recommended if the attractive emo-

tional content of the children games is to be respected. Besides these games, we were using different physical fitness exercises that we could adapt for Autistic preschool children. The program, as well as the assessment, were provided by the authors with kindergarten staff support.

RESULTS

In this chapter quantitative and qualitative results are presented. We will focus mainly on the quantitative results, pre and post intervention, including the Total Impairment Score (T.I.S), and the scores in the three Subtests of MABC: Manual Dexterity (MD); Ball Skills (BS); Static & Dynamic Balance (SDB). The score is recorded in points. The qualitative results include personal observations during the intervention related to the guidelines for the M-ABC test.

Participant one: P. S.

Male, 75 months old on the day of the first assessment (77 months old after intervention). His diagnosis was recognized as Asperger syndrome. He was enrolled in the kindergarten at the age of 45 months and accepted in a case study when he had already been involved in the kindergarten for 30 months. The predominant characteristics of this child are confusion, being easily distracted and not being able to concentrate during the activity. Another of his characteristics is day dreaming.

Quantitative results:

P. S. obtained a total impairment score of 27 before the intervention, which placed him below the 1st percentile for his age and, after the intervention, he had a score of 13.5, which placed him in the 5th percentile for his age. In the subtests:

- In Manual Dexterity, he scored 12 before the intervention and 7.5 after the intervention. In posting coins and at the bicycle trial, he scored better after the intervention, but in threading beads there were no differences before and after the intervention.
- In Ball Skills, he scored 5 before the intervention and 0 after the intervention. In catching a bean bag and rolling a ball into the goal he scored better after the intervention, i.e. he was without any impairment in ball skills after the intervention.
- In Static and Dynamic Balance, he scored 10 before the intervention and 6 after the intervention. In one leg balance and walking heels raised, he scored better after the intervention, and in jump over a cord he was successful both before and after the intervention.

Qualitative results:

In general, P. S. showed happiness and signs of joy during the whole time of the intervention. At the beginning, he did not show much interest in physical activities, but he participated. After a few classes he became interested, and showed joy and happiness during the classes. Each activity was interesting for him and he did everything relatively successfully. In particular, he enjoyed the running. It was even possible to see a smile on his face. Exercising with a ball was also interesting for him. He did well on both of the tests, both before and after the intervention and he acted interested.

P. S. participated in 10 out of 16 classes of physical activities, which means he received 62.5% of the intervention.

Participant two: B. L.

Male, 68 months old on the day of the first assessment (70 months old after the intervention). His diagnosis was defined as childhood autism and intellectual disability, behavior impairment and a specific developmental delay of speech and language. He was enrolled in kindergarten when he was 50 months old and accepted in a case study when he had already had 18 months of involvement in the kindergarten. The predominant characteristics of this child were impulsiveness, impatience, disorganization, being easily distracted, confusion and loss of concentration arising during the activity.

Quantitative results:

B. L. obtained a total impairment score before the intervention of 35, which placed him below the 1st percentile for his age and, after the intervention, of 24, which placed him again below the 1st percentile for his age. In the subtests:

- In Manual Dexterity, he scored 12 before the intervention and 9 after the intervention. In posting coins, he scored better after the intervention. In threading beads, he scored worse after the intervention. In bicycle trial there were no differences in his performance before and after intervention.
- In Ball Skills, he scored 8 before the intervention and 0 after the intervention. In catching a bean bag and rolling a ball into the goal, he scored better after the intervention, i.e. he was without impairment in ball skills after the intervention.
- In Static and Dynamic Balance, he scored 15 before the intervention and 15 after the intervention. In the events called one leg balance, walking heels raised and jump over a cord, there were no differences in his performance before and after the intervention, i.e. there was a maximum impairment score.

Qualitative results:

Although the assessment of B. L. showed improvements in his motor skills, he didn't seemed to be interested in almost any activities during class. He needed assistance to perform any activity, mainly because he wasn't able to understand what he needed to do. He did

not concentrate and many times during the class or during the testing he was just looking around. He seemed hyperactive, was making unnecessary movements and was also speaking quietly without any specific meaning. For the last three weeks of the intervention he did showed interest in some activities: running, stretching and in all activities with the ball, but he couldn't keep his attention on one activity for very long. In the last few classes, he was running around and smiling without anybody asking him to do that. During the testing procedure, he only showed interest in performing the tasks of posting coins and threading beads, in both of which he was successful. In all other tests though, he didn't show any interest.

B. L. participated in 15 out of the 16 classes of physical activities, which means he received 95.75% of the intervention program.

Participant three: M. A.

Male, 69 months old on the day of the first assessment (71 months old after intervention). His diagnosis was defined as childhood autism. He was enrolled in the kindergarten when he was 63 months old and accepted in a case study when he had 6 months of involvement in the kindergarten. The predominant characteristics of this child were impulsiveness, hyperactivity and being easily distracted.

Quantitative results:

M. A. obtained a total impairment score before the intervention of 20 which placed him in the 4th percentile for his age and, after the intervention, his score was 16.5, which placed him in the 6th percentile for his age. In the subtests:

- In Manual Dexterity, he scored 10 before the intervention and 12.5 after the intervention. In posting coins and threading beads, he scored worst after the intervention. At the bicycle trial, he scored better after the intervention.
- In Ball Skills, he scored 3 before the intervention and 0 after the intervention. In catching a bean bag, he scored better after the intervention and in rolling a ball into the goal, there was no impairment, neither before nor after the intervention.
- In Static and Dynamic Balance, he scored 7 before the intervention and 4 after the intervention. In the tasks of one leg balance and walking heels raised, he scored better after intervention, and in jump over a cord he was successful both before and after intervention.

Qualitative results:

At the beginning of the intervention, he didn't show any interest in physical activities, but this didn't last long. After a few classes he was so happy and active in all activities that it didn't matter if it was running, jumping or just some static game. He was successful in all games, especially in jumping, which was one of his favorite activities, but, during the testing procedures, he wasn't able to concentrate, nor to exhibit eye contact. After promising him some candy for after the testing, he was motivated to finish the tests without a lot of assistance.

M. A. participated in 14 out of 16 classes of physical activities, which means he received 87.5% of the intervention.

Participant four: O. K.

Male, 64 months old on the day of the first assessment (64 months old after the intervention). His diagnosis was defined as childhood autism and intellectual disability. He was enrolled in the kindergarten when he was 58 months old and accepted in the case study when he had had 6 months of involvement in the kindergarten. The predominant characteristics of this child were passive behavior, disorganization, confusion, and support and help being essential in his education program.

Quantitative results:

O. K. obtained a total impairment score before the intervention of 39, which placed him below the 1st percentile for his age and, after the intervention, he had a score of 35, which placed him again below the 1s^{t} percentile for his age. In the subtests:

- Of Manual Dexterity, he scored 15 before the intervention and 15 after the intervention. There were no differences observed between before and after the intervention.
- In Ball Skills, he scored 9 before the intervention and 5 after the intervention. In catching a bean bag and rolling a ball into the goal, he scored better after the intervention.
- In Static and Dynamic Balance, he scored 15 before the intervention and 15 after the intervention. No differences were observed between before and after intervention.

Qualitative results:

O. K. was the only child in the group who couldn't do almost any activities. He was motivated and he concentrated, but he has a high impairment of motor skills and only moderate intellectual disability. This means that he needed more time to learn how to perform some of the activities. In the last few weeks of intervention, he finally learned to run without assistance and he liked to run. He used ball skills in that he managed to push the ball, which was impossible at the beginning of the intervention. In testing procedures, he performed well considering his abilities.

O. K. participated in 11 out of 16 classes of physical activities, which means he received 68.75% of the intervention.

Participant five: T. K.

Female, 81 months old on the day of the first assessment (83 months old after intervention). Her diagnosis was defined as childhood autism. She was enrolled in the kindergarten when she was 51 months old and accepted in a case study when she had already had 30 months of involvement in the kindergarten. The predominant characteristic of this child were passive behavior and speech problems. She does not respond independently unless motivated or prompted.

Quantitative results:

T. K. obtained a total impairment score before the intervention of 14, which placed her below the 5th percentile for her age, and, after intervention, of 16, which placed her in the 2nd percentile for her age. In the subtests:

- In Manual Dexterity, she scored 9 before the intervention and 7 after the intervention. In posting coins, she scored better after the intervention, but in threading beads and the bicycle trial there were no differences between before and after the intervention.
- In Ball Skills, she scored 5 before the intervention and 6 after the intervention. In catching a bean bag, she scored the same before and after the intervention and in rolling a ball into the goal, she scored worse after the intervention.
- In Static and Dynamic Balance, she scored 0 before the intervention and 3 after the intervention. In both one leg balance and jump over a cord, no differences were observed, she was successful both before and after the intervention. In walking heels raised she scored worse after the intervention.

Qualitative results:

T. K. was able to concentrate and was interested from the beginning in all activities during the class: running, ball games, balloons, jumping, and, at the end, the match game. She was able to perform all activities without any problems. She presented joyous behavior during every class. At the beginning she had some difficulties when doing the match game. It was a little bit hard for her to recognize some of the objects on the paper, but after a few classes she managed to do it. During the testing procedure she showed signs of joy and happiness.

T. K. participated in 6 out of 16 classes of physical activities, which means that she received only 37.5% of the intervention.

DISCUSSION

The main purpose of this research was to measure the extent of impairments before and after eight weeks of physical activity intervention in fine and gross motor skills concerning preschool children with autism spectrum disorder. All children with ASD had movement impairment according to the M-ABC. For the purpose of this study it is more meaningful to discuss each case separately with global remarks.

Participant one: P. S. had a total impairment score before intervention of 27, which indicates a poor level of motor performance. But, after intervention, scored 13.5, which means he is on the borderline (Henderson & Sugden, 1992). His test performance was the best among all the participants after the intervention.

He improved his manual dexterity, probably because of the match game, and decreased his impairment by 30%. Physical activity intervention was developed according to the children's abilities and interests. Since the children enjoy ball games the most (and P. S. was not an exception in that area), physical activity classes were mainly focused on ball games. For that reason, P. S. scored 5 on the test of ball skills before the intervention and 0 after the intervention, which means that P. S. is without impairment in ball skills after the intervention. He also improved his static and dynamic balance. His static balance impairment decreased by 20% after intervention. His total impairment score decreased by 50% due to the physical activity intervention. If he hadn't missed six physical activity classes, he would have improved his motor skills even more. No resistance was noted during the intervention nor during the testing. A possible explanation of this is that the presence of the children's teacher in every class made him feel comfortable.

Participant two: B. L. had a very low level of motor performance. His total impairment score was 35 before the intervention. After the intervention his total impairment score was 24. The reason might be that he was present at 15 out of the 18 classes, which means he received 95% of the intervention. He also is the only child in the group who has a participation score of over 90%. He improved his manual dexterity by 20% and his ball skills score went from 9 to 0. This means that he is without any impairment in ball skills after the intervention. He demonstrated his joy during all the ball games. His dynamic and static balance didn't change after the intervention. We can speculate that this is because the intervention didn't have any balance games. His total impairment score decreased by 27.5% due to the physical activity intervention. Generally, B. L. had only limited interaction with his environment and demonstrated even more limited expressiveness during the whole intervention and testing procedure. From this perspective, the inquiry has demonstrated that social-skill deficits as well as different kinds of behavioral problems seem to cooccur with attention, motor, and language problems (Szatman, Offord, & Boyle, 1989; Moffitt, 1990; Frick, Kamphaus, Lahey, & Loeber, 1991; Kavale & Forness, 1996).

Participant three: M. A. had a total impairment score of 19, which indicates a serious developmental delay. But, after the intervention, he had a score of 16.5.

He didn't improve his manual dexterity and his impairment score is higher now than before the intervention in this subtest. A possible explanation might be his lack of concentration and eye contact during the testing procedure. His ball skills improved from 9 to 0, which indicate that he is without any impairment in ball skills after the intervention. He expressed joy during all the ball games. His dynamic and static balance improved from 7 to 4.

His total impairment score decreased by 8.75%. This finding is not excellent considering that he received 87.5% of the intervention. It could be a lack of motivation in the testing procedures that are the cause of the small size of this increase. Regarding the qualitative aspects of his performance, M. A. seemed to have a problem with comprehending the instructions. This problem, which is probably one of the main reasons that resulted in the child's low performance, could be due to an attention deficit, which is a common characteristic of autistic individuals (Frith & Hermelin, 1969; Fulkerson & Freeman, 1980; Varni, Loovas, Koegel, & Everett 1979; Wing, 1976).

Participant four: O. K. had a very low motor performance level with a total impairment score of 39 before intervention and 35 after intervention. He improved only his ball skills from 9 to 5. His manual dexterity and static and dynamic balance were without improvement. His interaction with the environment and even more limited expressiveness during the whole intervention procedure were generally very good.

His total impairment score decreased to 10%. Since he received the diagnoses of autism and mental retardation, his improvement of motor skills by 10% can be considered to be his great success. Auxter, Pyfer and Huettig (2005) stated that motor delays are very common among persons who are severely mentally retarded. Generally, the greater the intellectual disability is, the greater the lag in attaining major developmental milestones (Winnick, 2005).

Participant five: T. K. had a total impairment score of 14 before the intervention and 16 afterwards. This indicates that she had a motor delay, but after eight weeks she has even a more serious developmental delay. This means that there were no improvements in her motor skills. The reason for this is that she was only present at 6 physical activity classes out of 16, which means that she received only 37.5% of the intervention. But why is her impairment higher now than before eight weeks at the beginning of the intervention? The reason could be the fact that she didn't go to kindergarten for the last four weeks. On the day of the assessment before the intervention, she was in the kindergarten almost every day, but at home she didn't have any activities. As a consequence of her inactivity, her motor skills impairment increased.

Global remarks

Despite the great impairment in motor development of autistic children tested in this study, they have the right to participate and succeed in motoric programs, but they need the help, guidance and support of physical educators who are really willing to help these children to improve their motor development. In fact stimulation and early intervention oriented to mobility improvement is considered to be a basic approach for the future of these children's development (Kavale & Forness, 1996; Orr, 1998; Stedman, 1988; Winnick, 2005). This is the most important finding of the study.

In general, children with autism face difficulties in certain domains of motor development. The observed characteristics described in the presented case studies are common in children with autism. This is a problem with both gross and fine motor skills; repetitive and unusual movements of the body and perceptual deficits that affect psychomotor performance in specific fine manual motor skills. Winnick (2005) and others (Casto & White, 1984; Fox & Riddoch, 2000; Odom, 1988; Stedman, 1998; Varni et al., 1979) indicate that the reason for this impairment in children's motor development can be coded as a biochemical error or a disturbance in the central nervous system. But nothing has been proven yet and new studies have to be conducted in order to distinguish what really affects and causes the deterioration of this impairment. There are also studies indicating that children with autism have problems with motor imitation, so they cannot imitate a movement in order to learn it after a period of time (Auxter et al., 2005; Casto & White, 1984; Corbin & Pangrazzi, 1999; Varni et al., 1979; White & Casto, 1985), but there are studies as well that indicate improvements in motor imitation skills in children with autism related to appropriate intervention. The benefits of early intervention, such as the mean of the improvement of the motor and social skills of children with a disability have been presented (Samouilidou & Válková, 2006). This is also supported by a large number of studies (Casto & White, 1984; Cowden, Sayers, & Torrey, 1998; Guralinick, 1991; Odom, 1988; Orr, 1990; Sayers, Cowden, Newton, Warren, & Eason, 1996). The presented research results can be classified as early kindergarten educational intervention, which seems to be considered to be background information. Even findings in the presented studies were not successful in all cases in movement and behaviour improvement, which was documented as related to the applicable diagnoses, the length of inclusion in special care and the length of the intervention program.

Moreover, such children have problems with social interaction, which means that they cannot learn some basic motor skills, as social interaction is required for this acquisition. For instance, for the acquisition of ball skills, children typically require partners to practice with, which automatically implies social interaction.

Undoubtedly, we really have to distinguish among these and plan individualized exercise motor programs as children have differing levels of impairment. They require their special needs to be met in a different manner, and they have specific motor delays that cannot be mixed together. So, motor programs can only be successful if they are adapted to the needs of particular children, contributing as a result to their mental, social and motoric condition and a healthy way of life.

CONCLUSION

Children with autism possess communication and social skill abilities that may enable them to be included with their peers in educational and recreational settings. If children with autism have the chance to be a part of early intervention programs, then it will be important for them to possess or acquire motor skills that will allow them to remain involved.

Most importantly, the differences in motor skills levels occur over time in our sample of preschoolers with Autism Spectrum Disorder involved in intervention programs. The positive development of participants is presented related to the differences between pre and post periods of the eight weeks of the intervention program. The improvement was visible in both a quantifiable and qualitative way. All five children showed their enjoyment of participating in physical activity and four out of five made very good progress in motor skills.

A minimum of eight weeks of inclusion in an intervention program (a longer period of time would be better) can improve these children's motor abilities and skills. Even the small improvement presented was a great opportunity for parents to watch their autistic children participating equally in physical activities typical for early childhood. Any intervention program has to respect the special content needed for an individual as well as individual educators' approaches, relevant to the communication needs of preschool children with autism in order to support a learning environment that gives children the opportunity to master their motor skills.

Limitations of the study are:
- participation of only five children,
- no control group,
- time limitations for the intervention,
- space limitations for the intervention,
- the translation of the ABC-M battery for preschool autistic children into the Czech language.

Regarding future research, the same intervention should be done in a bigger group of participants and with a control group, so that a generalization of the results would be acceptable and meaningful. In addition, intervention should last one year, so that the final result would show the influence of early intervention in the area of physical activity in preschool children with autism spectrum disorder.

For further research we would also recommend the testing of the validity and reliability of the ABC-M battery for preschool children with autism.

The intervention program improved the movement skills of preschoolers with autism and they, as we have already said, displayed enjoyment of the activities and interest in participating in the intervention tasks. Preschool children with autism need regular physical activity. This might help them to increase their future participation in physical activity or sport.

The impact of the presented study should be useful in the domain of adapted physical education for children with autism spectrum disorder and contribute in some way to support the improvement of motor development in such participants.

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APPENDIX

Description of age band one

Movement Assessment Battery for Children the M-ABC is a clinical assessment used to determine the extent of impairment in fine and gross motor skills. It includes eight items divided into three subtests; manual dexterity, ball skills, and static and dynamic balance; the tests are also divided into four age bands, with children undertaking different activities depending on their age. The battery has been purposely designed to identify deviant or impaired performance and will not provide information on the overall motor abilities of the child, if the skills are advanced for their age. Authors of this test have stated the purposes of its use as identification and screening, intervention planning, program evaluation and as a research tool. Although M-ABC was validated on children without disabilities, it can also be used with children with disabilities who have the ability to acquire normal motor patterns, such as children with mental retardation, autism, visual impairments, and hearing impairments. The performance test can be administered to children from the age of four up to the age of 12. In all, there are 32 items in the battery – subdivided into four age categories. These age categories are called "age bands" and are distributed as follows. Age band one (4–6 years), age band two (7–8 years), age band three (9–10 years) and age band four (11+ years). For the purpose of this study, age band one was used. With 8 tasks in each age band, these are again divided into three areas, each associated with a different area of motor development. All three areas are identical throughout the battery in order to allow for continuation from one age band to the next and to allow for the monitoring of progression as the child grows older. The three areas are manual dexterity (MD), ball skills (BS) and static and dynamic balance (SDB) and the 8 tasks within the first two age bands are highlighted below.

Manual dexterity (MD): PC – posting coins
TB – threading beads
BT – bicycle trail
Ball skills (BS): CBB – catching a bean bag
RBG – rolling a ball into a goal
Static and dynamic balance (SDB):
OLB – one leg balance
JOC – jumping over a cord
WHR – walking with heels raised

VLIV RANÝCH INTERVENČNÍCH POHYBOVÝCH PROGRAMŮ NA ROZVOJ MOTORICKÝCH DOVEDNOSTÍ U DĚTÍ PŘEDŠKOLNÍHO VĚKU S PORUCHOU AUTISTICKÉHO SPEKTRA (PŘÍPADOVÁ STUDIE)

(Souhrn anglického textu)

CÍLE: Účelem předložené studie bylo zhodnotit motorické dovednosti předškolních dětí s poruchami v autistickém spektru po osmitýdenním intervenčním programu.

METODIKA: Experimentu se zúčastnilo 5 dětí, 4 chlapci a 1 dívka ve věku od 62 do 81 měsíců. Všichni navštěvovali stejnou speciální mateřskou školu. Šetření zahrnovalo jak kvantitativní, tak kvalitativní aspekty. Kvantitativní data účastníků byla měřena testem M-ABC (Baterie motorického vyšetření dětí) podle Henderson a Sugden (1992), zatímco kvalitativní data byla získána pozorováním. Intervenční pohybový program trval osm týdnů a děti byly měřeny před a po intervenci.

VÝSLEDKY: Čtyři děti po programu vykazovaly zlepšení dovedností, jedno dítě nikoliv.

ZÁVĚRY: Studie uzavírá, že i děti s poruchou v autistickém spektru mohou dosáhnout zlepšení v motorických i sociálních dovednostech, pokud jsou zařazeny do intervenčního pohybového programu minimálně dvakrát týdně, což může napomoci jejich dalšímu rozvoji.

Klíčová slova: mentální postižení, motorický rozvoj, porucha v autistickém spektru, M-ABC (Baterie motorického vyšetření dětí), raná intervence.

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CONDITION AND BODY CONSTITUTION OF SOCCER PLAYERS IN CATEGORY U19 BEFORE AND AFTER COMPLETING A PREPARATORY PERIOD

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Submitted in January, 2010

BACKGROUND: The level of one's conditioning predisposition and somatic factors are one of the main components determining the quality of an individual's performance in soccer.

OBJECTIVE: The aim of this study was to evaluate changes in selected motor, functional and somatic parameters of soccer players in category U19, who completed the long used model of a training program employed in the preparatory period of soccer players.

METHODS: The monitored group was composed of 14 players from SK Sigma Olomouc in category U19. The categories being evaluated comprised: their starting and acceleration speeds in the 10 m, 30 m and 30 m sprint with a flying start, the vertical jump, the isokinetic muscular strength of the knee joint and their maximum aerobic capacity. Of the monitored somatic factors attention was mainly focused on body height and weight, percentage of body fat, quantity of fat free mass and the overall amount of water in their bodies.

RESULTS: From the spectrum of examined motor and functional parameters the only value that changed significantly with the players was the average value of VO_2max from 56.65 to 58.85 $ml.kg^{-1}.min^{-1}$ ($p = 0.04$). Among the somatic factors a significant decrease was seen with the values of the Body Mass Index from 22.51 to 22.28 $kg.m^{-2}$ ($p = 0.03$).

CONCLUSIONS: In the context of the players' performance the expected changes of the monitored parameters were not observed. It is believed that the traditional model of soccer players' preparation does not lead to the desired changes in conditioning and somatic parameters.

Keywords: Physical preparation, soccer, motor-abilities tests, somatic diagnosis, spiroergometry.

INTRODUCTION

Any increase in trainability and sports performance is conditioned by means of a systematic training process leading to achieving specific adaptation changes in the organisms of athletes. The effectiveness of a training process is connected to managing adaptation mechanisms based on revealing the basis and effects of adaptation changes caused by training stimuli. The course of results of the adaptation processes to the repeated training stimuli has its specifics and is usually different among individual athletes. The decisive requirement is to optimize the training load and loading with regard to the current level of conditioning and trainability of athletes, their adaptation capacity, their current health and physical condition and tasks of their training cycle (Abernethy, Kippers, Mackinnon, Neal, & Hanrahan, 1996; Bompa & Carrera, 2005; Dobrý, 2001; Dovalil et al., 2002).

In sport games the load and its manipulation arise from the typical requirements of a game load, the specifics of the players' specializations and their roles within the system of the game of the team and the concept of the team's game performance The adaptation stimuli should be combined appropriately and at the same time sufficient opportunity and conditions for fast recovery should be created. The goals and tasks of smaller training cycles must be continuous, while the basic task of the periodization of an annual training cycle is to take advantage of the effects of different training loads that build on their complementing each other in an optimal time period and to limit fatigue and other negative factor accumulation that can lead to overtraining (Bompa, 1999; Kraemer & Häkinen, 2002). Especially in key stages of the training process, before, in fact, even after training cycles with high loads and before, and in fact even after competitions, testing becomes more crucial, since it reflects specific demands on the condition and preparedness of sportspeople (Stone, Me & Stone, Mi, 2006).

In soccer, the resultant activity of players in a game depends on the level of their technical, tactical, physical and condition abilities and somatic predispositions. The basic aspect from which each performance of an individual in sport games arises is their condition preparedness. The condition training program of top level teams

must be specific, i.e. stem from a thorough analysis of sport performance requirements of their condition (Bravo, Impellizzery, Rampinini, Castagna, Bishop, & Wisloff, 2008; Hoffman, 2002; Holienka, 2005). Among the basic components of a soccer player's condition, which become the biggest focus during the preparation phase are the starting speed and running acceleration, explosive and fast power, aerobic and anaerobic endurance (Bradley et al., 2009; Psotta, Bunc, Mahrová, Netscher, & Nováková, 2006; Verheijen, 1998).

The level of a sporter's condition and its changes are in many cases connected to the level of somatic factors. Their testing and possible manipulation influences other factors of sports performance. Most commonly interest is focused on the individual's height and weight, length and width parameters, body mass index (BMI), the percentage of representation of body fat and muscle mass expressed in fractions and possibly on the somatotype. The focused development of the condition is most often the main task, especially during the preparatory period, which usually focuses on creating a sufficient condition level, starting from which the players should gain during the competition period. The generally used paradigm during the preparatory period is focused on all of the basic components of condition. Such conceived training requires, due to the duration of the preparatory period, a parallel application of many types of adaptation stimuli. Although the opinions of training programs of such character are not completely uniform, it is becoming apparent that their effectiveness may be lowered (Smith, 2003; Fry, 2004; Barnes et al., 2008).

AIM

The main aim of this study was to evaluate the effectiveness of the long used model of a training program applied in the preparatory period with soccer players of category U19.

METHODS

The monitoring was carried out with soccer players of a junior men's team, SK Sigma Olomouc, category U19 (n = 14; age 17.81 ±1.66 years of age; height 180.57 ±4.69 cm, weight 73.44 ±4.89 kg). Only players who had participated in more than 30 training sessions were included in the final analysis. From the original number of 20 players, six were eliminated due to their absences at training or testing. The testing of the selected motor and functional predispositions and body composition took place one day before the beginning and two weeks after the end of a five week training block. The measurements were carried out in the laboratories of Palacký University, Olomouc and at the athletic stadium in Olomouc. The beginning of the training period was preceded by a three week holiday. Two days before the measurements the players were not subjected to a higher training load.

The testing of the motor predispositions was carried out after a thorough warm up; no player indicated any health problems. The current levels of conditioning and somatic factors were evaluated with the help of the following tests:

Sprint tests

On a four hundred meter track, soccer players performed 3 tests: a 30 m sprint with a flying start (in order to run at their maximal velocity, they had 15 m to accelerate before the first timing light) and 30 m sprint from a standing position to estimate acceleration and velocity and a 10 m sprint from a standing position to estimate starting velocity. Sprint times were measured using electronic timing lights (TAG Heuer, Neuchatel, Switzerland). The higher values of the two trials were used for analysis; the recovery time was 6 minutes.

Vertical jump tests

In order to measure the explosive power of the lower extremities, participants jumped twice in each of the two jumping modalities: the standing vertical jump and the standing vertical jump with the arm fixed at the shoulders. Dynamometric platform (Kistler Instrumente, Winterthur, Switzerland), measuring the size of the reactive force during the jump was used. The higher values of the two trials were used for analysis; the rest interval was 30 seconds.

Isokinetic flexion and extension in the knee joint

The unilateral concentric strength of knee flexors and extensors was measured in a seated position using the isokinetic dynamometer, Isomed2000 (D. and R. Ferstl, GmbH, Hemau, Germany). The range of motion was 80°, the angular velocity was $60°\cdot s^{-1}$; three repetitions were performed in one set and the higher values of the two sets were used for analysis. The best maximal peak torque was measured. Recovery time was one minute between sets, and three minutes between the right and left leg measurements.

Assessment of maximum oxygen intake

The maximum running test was performed on a Lode Valliant treadmill (Netherlands). The test began with a warm up phase: 4 min. at 8 $km\cdot h^{-1}$ and one min at 8 $km\cdot h^{-1}$ with a 5% inclination, respectively. Immediately after the warm up, the speed increased to 10 km/h–1 and the elevation remained at 5%. Then the speed increased every 30 s by 1 $km\cdot h^{-1}$ till 15 $km\cdot h^{-1}$ (maximum speed). At 15 $km\cdot h^{-1}$, the elevation increased

every 30 s by 2.0% till exhaustion. During the test, the subject breathed with a mask: ventilation and both O_2 and CO_2 exchange were analyzed.

Assessment of body composition

The body composition data was collected using multi frequency bioelectrical impedance analysis (MFBIA) (InBody 720; 1–1 000 kHz) under standard conditions provided in the manual of the equipment (Biospace, 2006). InBody 720 makes use of an eight point tactile electrode system and it differentiates body weight into three basic components (three component model): total body water (TBW), intracellular water (ICW) and extracellular water (ECW), dry body mass (DBM) (proteins and minerals) and body fat mass (BFM.). For a complex anthropometric description of the monitored collection the Body Mass Index (BMI), Fat Free Mass Index (FFMI) and Body Fat Mass Index (BFMI) were calculated.

Training program

The training program in the preparatory period, which has been long used at the club level, was modified and during the selection of training approaches and methods results of some current studies were taken into account (Hoff, Kaehler, & Helgerud, 2006; Dupont & Berthoin, 2004; Helgerud, 2007; McMillan, Helgerud, Macdonald, & Hoff, 2005). The five week training cycle included a total of 35 training units and eight friendly matches. Out of the 35 training units, 13 were primarily focused on the development of strength and 11 training units on aerobic endurance development (TABLE 1). The rest of the training units were focused on improvement of playing activities of individuals and practice of group and team tactics.

TABLE 1
Training units with strength exercises and endurance exercises and friendly matches in the preparatory period

Weeks	Strength (Half squats)	Endurance	Friendly matches
1st week	3×	3×	2×
2nd week	3×	3×	2×
3rd week	2×	2×	1×
4th week	3×	2×	2×
5th week	2×	1×	1×
Total	13×	11×	8×

Expert logical significance

The logical significance of the differences in average scores on motor and functional tests was determined in an expert way as follows:

- The height of a jump in a test of a vertical jump from a standstill – 3 cm.
- The height of a jump in a test of a vertical jump from a standstill with arms fixed – 3 cm.
- The time reached during a test of a sprint from a standing position for 10m – 0.06 s.
- The time achieved in the test sprint from a medium–high starting block for 30m – 0.19 s.
- The time achieved in a test of the 30 m sprint with a flying start – 0.15 s.
- Isokinetic flexion and extension in the knee joint – 15, in fact 20 N·m.
- The maximum oxygen uptake during the test VO_2max on a treadmill – 5 $ml.kg^{-1}.min^{-1}$.

Statistical analysis

For individual parameters basic statistical quantities were calculated. The average differences between the first and the second examination were evaluated through a Sign test. For statistical analysis of the data the Statistica 8 (Statsoft, 2008) program was used.

RESULTS

The results of the statistical verification of the significance of differences in test scores from the first and second measuring of motor and functional predispositions (TABLE 2) indicate that in following a five week training program, a significant increase in value took place only in cases where the average value was VO_2max. However, from the point of view of significance for game performance, such changes (improvement in the average test score by 1.94 $ml.kg^{-1}.min^{-1}$) are regarded as nonsignificant. In the case of isokinetic power it is possible to detect an increase in the value of the maximum peak moment during the flexion of the right leg by 3.93 N·m, nevertheless, this increase is regarded to be both statistically and logically insignificant.

The average values of body height are, during the first and the second examination, almost identical in cases of body weight where a lowering by 0.72 kg has been detected (TABLE 3). The average BMI values were localized in the normal range (18.5–24.9 kg/m^2; WHO, 2007) and the difference between the first and the second examination can be marked, based on statistical analysis, as significant ($p = 0.026$). A lowering of the amount of overall body water, especially its intracellular parts, has been revealed. TBW contributes to the body weight from 68.03% during the first examination and, in fact, from 67.82% in the case of the second examination. Regarding the fact that the intracellular body water is concentrated primarily in the fat free mass, its reduction is also reflected in the decreasing of the skeletal muscle mass by 0.65 kg, as well as in the reduction of the FFMI by 0.24 kg/m^2. Logically, with the lowering of the FFMI,

TABLE 2
The basic statistical characteristics of the monitored motor and functional indicators and verification of significance of the differences between the first and the second measurement (n = 14)

Characteristic	1st examination			2nd examination			d	Z
	M	Mdn	SD	M	Mdn	SD		
RL-Peak torque-Flexion (N·m)	165.36	165.50	19.20	169.29	167.50	31.11	3.93	.80
RL-Peak torque-Extension (N·m)	233.64	247.50	47.54	219.57	231.00	44.84	14.10	–.27
LL-Peak torque-Flexion (N·m)	169.86	167.50	22.27	162.14	162.50	27.33	7.72	.80
LL-Peak torque-Extension (N·m)	243.93	242.50	39.76	233.07	232.50	39.24	10.90	1.66
Sprint 10 m (s)	1.81	1.81	.07	1.82	1.80	.08	.01	.00
Sprint 30 m (s)	4.20	4.22	.09	4.23	4.20	.09	.03	.00
Sprint 30 m with a flying start (s)	3.45	3.46	.06	3.51	3.51	.05	.06	1.81
Vertical jump with arms (cm)	.42	.41	.04	.44	.41	.07	.02	.80
Vertical jump-arms on shoulders (cm)	.39	.39	.04	.38	.37	.41	.01	1.34
VO_2max ($ml.kg^{-1}.min^{-1}$)	56.65	57.35	6.97	58.59	58.85	5.09	1.94	*2.02

Legend:
RL – right leg
LL – left leg
M – mean
Mdn – median
SD – standard deviation
d – diference
Z – value of statistical criterion (Sign test)
* statistically significant values ($p < .05$)

TABLE 3
The basic statistical characteristics of the monitored anthropometrical indicators and verification of significance of the differences between the first and the second measurement (n = 14)

Characteristic	1st examination			2nd examination			d	Z
	M	Mdn	SD	M	Mdn	SD		
Height (cm)	180.57	180.00	4.69	180.43	179.50	4.82	.14	1.47
Weight (kg)	73.44	72.84	4.89	72.72	73.51	4.53	.72	1.87
Intracellular water (l)	31.67	31.45	2.55	31.16	31.50	2.11	.51	1.87
Extracellular water (l)	18.29	18.00	1.50	18.16	18.05	1.21	.13	–.27
Protein mass (kg)	13.69	13.60	1.12	13.49	13.65	.90	.20	1.44
Mineral mass (kg)	4.61	4.62	.42	4.57	4.57	.36	.04	.80
Body fat mass (kg)	5.16	5.40	1.95	5.34	5.35	1.79	.17	–.27
Percent body fat (%)	7.06	7.53	2.71	7.34	7.32	2.38	.28	–.01
Skeletal muscle mass (kg)	39.30	39.00	3.35	38.65	38.11	2.75	.65	1.87
Body mass index (kg/m^2)	22.51	22.61	1.19	22.28	22.29	1.13	.23	*2.22
Fat free mass index (kg/m^2)	22.92	20.74	1.18	20.68	20.68	.84	.24	1.34
Body fat mass index (kg/m^2)	1.60	1.65	.64	1.65	1.58	.59	.05	–.26

Legend:
M – mean
Mdn – median
SD – standard deviation
d – diference
Z – value of statistical criterion (Sign test)
* statistically significant values ($p < .05$)

representation is connected to the rise of the absolute and relative representation of body fat. During the first measurement the average value of the body fat equaled 5.16 kg, i.e., 7.06% of the body weight; in the case of the second examination a rise by 0.18 kg was detected, which corresponds to 0.28% in relative terms.

DISCUSSION

A possible explanation of the stagnation of the monitored conditioning characteristics could be the fact that between the stimulation of endurance and muscle power undesirable interactions took place. The effects of strength training could have been, in the preparatory period, negatively affected by the increased focus on the aerobic endurance training and vice versa. A cursory evaluation of the test scores of individual players revealed individual differences in the changes of their performance in the monitored predispositions following the preparatory period. The authors assume that the aforementioned differences/variations could have been caused by the players' varying reaction to load in the preparatory period. The training program should have apparently respected more the individual needs of the players (Fleck & Kraemer, 2004; Barnes et al., 2008; Reilly & Bangsbo, 1998).

Fleck and Kraemer (2004) warn that simultaneous training has a negative influence on the results of strength training, especially when both types are intensive. Fry (2004) also clarifies the reduction of the high resistance strength training effects by the incorporation of another training plan with catabolic effects. At the same time he reminds us that strength training can have different effects on different players. The problem with regard to creating adaptations in monitored areas could also be the duration of the preparatory period, which can be insufficient because the necessary period might be longer because of simultaneous strength and endurance training (Bompa & Carrera, 2005).

Next to conditioning predispositions, the levels of somatic factors, which are in close connection to conditioning factors, were also monitored. When comparing our collected data with the average values of other players of the same age and level, the authors found in the monitored parameters only a few negligible differences. The average values of body weight and height were almost identical with the values of young elite players of a Spanish club indicated in their study by Arroyo, González de Suso, Sanchez, Ansotegui and Rocandio (2008). Greater differences can be observed when comparing the somatic parameters of our collection with the values of Premier League players, presented in their study by Sutton, Scott, Wallace and Reilly (2009). In comparison to the adult Premier League players, the tested players in our study have, on average, lower body weight by 10.1 kg; whereas their average body height is identical.

The average values of the percentage representation of body fat in our monitored collection is found at the lower zone of the optimal level (5–15%) delineated by Heyward and Wagner (2004) for a physically active male population between the ages 18–34. During the mutual monitoring of the monitored collection with the Spanish players a significant difference in the percentile number of fat could not be detected. In comparison with common values presented by Riegerová, Přidalová and Ulbrichová (2006), the values of body fat in our monitored group are substantially lower. This result corresponds to values indicated by Sutton et al. (2009), because in our data we monitored a body fat representation which was lower by 3.4% in comparison with players of the Premier League. However, we have to take into account different methods of measuring body fat in the aforementioned studies, which preclude objective comparison. In this study the MFBIA method was used, while Arroyo et al. (2008) and Riegerová et al. (2006) establish the amount of body fat using the skin-fold method and Sutton et al. (2009) determine the amount of body fat via the dual energy x-ray absorptiometry – DEXA method. A reduction in the skeletal muscle mass was an observed trend, which can be termed as inadequate in relationship to sport performance. In the same manner the rise of the absolute and the relative representation of body fat can be commented upon. The lowering of the skeletal muscle mass and the rise of the absolute and relative % BFM representation were observed, which can be termed as inadequate in relationship to sport performance.

In view of the our findings, we put forward that the model of preparation employed by the majority of soccer teams is not appropriate and that the simultaneous focus on strength, speed and endurance development is partially counter productive and does not lead to a significant improvement in the players' conditioning. It is also important to consider the number of training units and the demands of the training stimuli they include, because a high number of training sessions in the preparatory period is not compensated for by sufficient regeneration. It is becoming apparent that it would be appropriate to suggest and verify a new training program for the preparatory period, which would respect more the individual differences among players, including the starting level of their trainability, which would facilitate sequencing and respect the mutual influencing of the training load in training units and training cycle, including their facilitation (Verheijen, 1998; Wirth & Schmidtbleicher, 2007). From the point of view of directing the training process, it will be necessary in the new model to focus on the optimal usage of the training stimuli, with special attention to their type, inten-

sity, extent, duration and frequency, their simultaneous usage and also examine all of the above with regard to individual specifics. In terms of the players age and the character of their performance in soccer, the proportion of repeated speed stimuli, which at the same time stimulate the specific requirements on the players' endurance, could be stressed (Bradley et al., 2009; Bravo et al., 2008;), as well as progressive methods of increasing specific soccer speeds (Malý, 2009) and methods of strength development (Verheijen, 1998). A model based on the aforementioned fundamentals could have a higher potential for increasing players' performance in soccer. Considering the preventative measures of fatigue accumulation, injury and overloading, it would be significant during the preparatory period to also monitor the current level of adaptation capacity, i.e. monitoring the level of autonomous nervous system. The fact limiting this research is that the conditional and anthropometrical markers were evaluated from the point of view of the entire soccer team. Already from a cursory evaluation of the test scores, some individual variations in changes of the levels of the monitored predispositions become clear, e.g., with VO_2max improvement by 5.1 $ml.kg^{-1}.min^{-1}$, but also worsening by 6.9 $ml.kg^{-1}.min^{-1}$ or during the isokinetic strength measurement improvement by 63 N·m during the right lower extremity flexion, but also a worsening by 41 N·m during the right lower extremity extension. From the methodological point of view, the executed research was limited by the absence of a control group. These facts will be taken into consideration in the following research project, which will focus on verifying a newly drafted training program.

CONCLUSIONS

The conclusion of this study is that the applied model of the preparation, which coincided in its fundamental points with the commonly used model of the preparatory period, did not lead to the desired changes in motor, functional nor somatic parameters. The conclusion of this study is that with soccer players, who during the preparatory period participated in the model of the commonly used training program, did not achieve the desired improvement of motor, functional or somatic parameters. Not in a single one of the monitored indicators did changes take place that could have a positive influence on the player's performance. The model of preparation that focused on the simultaneous development of speed, strength and endurance did not lead to expected adaptations and was contested. In future studies it will be therefore advisable to focus on verifying the training program with a different structure, different extent and dosage of load.

ACKNOWLEDGEMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) "Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes".

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KONDICE A TĚLESNÉ SLOŽENÍ U FOTBALISTŮ KATEGORIE U19 PŘED A PO ABSOLVOVÁNÍ PŘÍPRAVNÉHO OBDOBÍ

(Souhrn anglického textu)

VÝCHODISKA: Úroveň kondičních předpokladů a somatických faktorů je jednou z hlavních komponent rozhodujících o kvalitě výkonu jednotlivce ve fotbale.

CÍLE: Cílem studie bylo posoudit změny vybraných motorických, funkčních a somatických parametrů u fotbalistů kategorie U19, kteří absolvovali dlouhodobě využívaný model tréninkového programu uplatňovaného v přípravném období fotbalistů.

METODIKA: Sledovaný soubor tvořilo 14 hráčů SK Sigma Olomouc kategorie U19. Posuzovány byly startovní a akcelerační rychlost na úsecích 10 m, 30 m a 30 m letmo, vertikální skok, izokinetická síla svalů kolenního kloubu a maximální aerobní kapacita. Ze sledovaných somatických faktorů byla pozornost zaměřena na tělesnou výšku a hmotnost, procentuální zastoupení tuku, tukuprostou hmotu a celkovou tělesnou vodu.

VÝSLEDKY: Ze spektra zkoumaných motorických a funkčních parametrů se u hráčů signifikantně zvýšila pouze průměrná hodnota u VO_2max z 56,65 na 58,85 $ml.kg^{-1}.min^{-1}$ ($p = 0,04$). U somatických faktorů došlo k signifikantnímu snížení hodnot Body Mass Indexu z 22,51 na 22,28 kg/m^2 ($p = 0,03$) a viscerálního tuku z 31,06 na 26,28 cm^2 ($p = 0,02$).

ZÁVĚRY: Změny u sledovaných parametrů nepovažujeme v kontextu individuálního herního výkonu za klíčové. Domníváme se, že klasický model přípravy fotbalistů nevede k požadovaným změnám kondičních a somatických parametrů.

Klíčová slova: kondiční příprava, fotbal, motorické testy, somatodiagnostika, spiroergometrie.

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SPECTRAL ANALYSIS OF HEART RATE VARIABILITY IN PATIENTS WITH SPINAL CORD INJURY

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BACKGROUND: Yearly, 200–300 new spinal cord injuries (SCI) happen in the Czech Republic. Some of these patients suffer from autonomic disturbances, especially concerning their cardiovascular and genito-urinary systems. Autonomic disturbances markedly decrease quality of life in patients with SCI. It is important to assess the severity of the autonomic nervous system (ANS) involvement in these subjects.

OBJECTIVE: The main aim of this study was to assess the spectral analysis of heart rate variability as a marker of cardiovascular autonomic regulation in patients with spinal cord injury and to compare it with findings in healthy controls.

METHODS: Ten paraplegics (with a mean age of 53.1 ±15.8 years, seven males and three females) participated in this study. There were five patients with incomplete and five patients with complete spinal cord injury. The ASIA – American Spinal Injury Association, the modified Ashworth scale and the Questionnaire on Autonomic Functions were used. Autonomic reactivity was evaluated by means of the spectral analysis of heart rate variability (SAHRV) method (short-term registration) using the supine-sitting-supine test. Diagnostic system VarCor PF7, which is an innovation of the VarCor PF6 system, was used. Twenty four healthy subjects (with a mean age of 51.9 ±9.4 years) were enrolled as a control group.

RESULTS: A marked decrease of the reactivity of the autonomic nervous system as a response to orthostatic changes was found in patients after SCI (paraplegics). In particular, characteristic responses of low frequency (LF) and high frequency (HF) spectral components during the body position changes were suppressed in these patients in comparison with healthy controls. Furthermore, a significant decrease in the spectral power of the LF and HF components was found in patients after SCI. The value of the spectrum's total power (TP) was significantly lower in the group of paraplegics in comparison with healthy volunteers, both in the first and in the repeated supine positions. A significant degree of orthostatic hypotension was registered only in two paraplegics in a sitting position. A lower increase in the LF/HF ratio was registered in a sitting position in a group of paraplegics in comparison with healthy subjects.

CONCLUSIONS: A decrease in the reactivity of the autonomic nervous system to orthostatic changes, which evidences disturbances of cardiovascular regulation, was found in patients after spinal cord injury (paraplegics). The reduction of the low-frequency component (LF) of the spectral analysis of heart rate variability reflects a lowered sympathetic activity in these patients in a sitting position. It reflects ortostatic disturbances in situations with body position changes associated with a modified orthostatic load. Blood pressure measurement and SAHRV contribute to a more precise assessment of the autonomic dysfunction in patients after SCI.

Keywords: Spinal cord injury, spectral analysis, heart rate variability, autonomic nervous system.

INTRODUCTION

Yearly, 200–300 new spinal cord injuries (SCI) happen in the Czech Republic. Some of these patients suffer from autonomic disturbances, especially concerning their cardiovascular and genito-urinary systems. Autonomic disturbances markedly decrease quality of life in patients with SCI. It is important to assess the severity of the autonomic nervous system (ANS) involvement in these subjects. The assessment of heart rate variability (HRV) with the use of the spectral analysis of heart rate variability (SAHRV) represents a method available in clinical practice. Using computer based programs, specific frequency bands and their oscillations can be quantified to estimate vagal and sympathetic activity contributions to heart rate.

A relatively low number of studies concerning autonomic nervous system function in subjects with spinal cord injury focused on this topic can be found in the literature (Bunten et al., 1998; Claydon et al., 2008; Chen et al., 2006; Wecht et al., 2003). The main aim of this study was to assess heart rate variability as a marker of cardiovascular autonomic regulation in patients with spinal cord injury and to compare it with findings in healthy controls.

MATERIAL AND METHODS

Ten paraplegics (with a mean age of 53.1 ±15.8 years, seven males and three females), participated in this study. There were five patients with incomplete and five patients with complete spinal cord injury. The ASIA – American Spinal Injury Association (Wise, 2009), modified Ashworth scale (Bohannon & Smith, 1987), and the Questionnaire on autonomic functions (Opavský, 2002) were used. Autonomic reactivity was evaluated by means of the SAHRV method in the supine-sitting-supine test (SSS test), which is a modification of the supine-standing-supine test (Opavský, 2002; Salinger, 1999). SAHRV was used as a sensitive, non invasive method for the evaluation of autonomic nervous system activity. The areas of the frequency spectrum are divided into three major components:

1. VLF (very low frequency, from 20 to 50 MHz) component, its origin hasn't been fully explained, yet.
2. The LF (low frequency, from 50 to 150 MHz, mainly about 100 mHz) component is explained mostly as a reflection of arterial baroreceptor sympathetic activity (Pagani et al., 1992).
3. HF (high frequency from 150 to 400 MHz) component represents a vagal activity associated with breathing (Malik & Camm, 1990).

Diagnostic system VarCor PF7, which is innovation of the system of VarCor PF6, was used. The ECG signal is obtained with the help of an electrode belt POLAR or electrodes placed on the thorax. A transmitter of this system works at a frequency of 433 MHz. (Štěpaník et al., 2005). The ECG signal was processed in PC with the use of special software for this diagnostic system (Salinger et al., 2005).

Twenty four healthy subjects (with a mean age of 51.9 ±9.4 years) were enrolled as a control group. Blood pressure values in the first supine position and at the end of their stay in the sitting position were measured.

RESULTS

A marked decrease in the reactivity of the autonomic nervous system to orthostatic changes was found in patients after SCI (paraplegics). In particular, characteristic responses of low frequency (LF) and high frequency (HF) spectral components during changes of body positions were suppressed in comparison with healthy controls (Fig. 1 and Fig. 2).

Furthermore a significant decrease in spectral power of the LF and HF components was found in these patients (TABLE 1 and TABLE 2). The value of the total power (TP) was significantly lower in the group of paraplegics in comparison with healthy volunteers, both in the first and in the repeated supine positions (TABLE 3 and Fig. 3). A significant orthostatic hypotension was registered only in two paraplegics when in a sitting position. A lower increase in LF/HF ratio was registered in a sitting position in a group of paraplegics in comparison with healthy subjects (TABLE 4 and Fig. 4).

Fig. 1
Spectral power of the LF component in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test

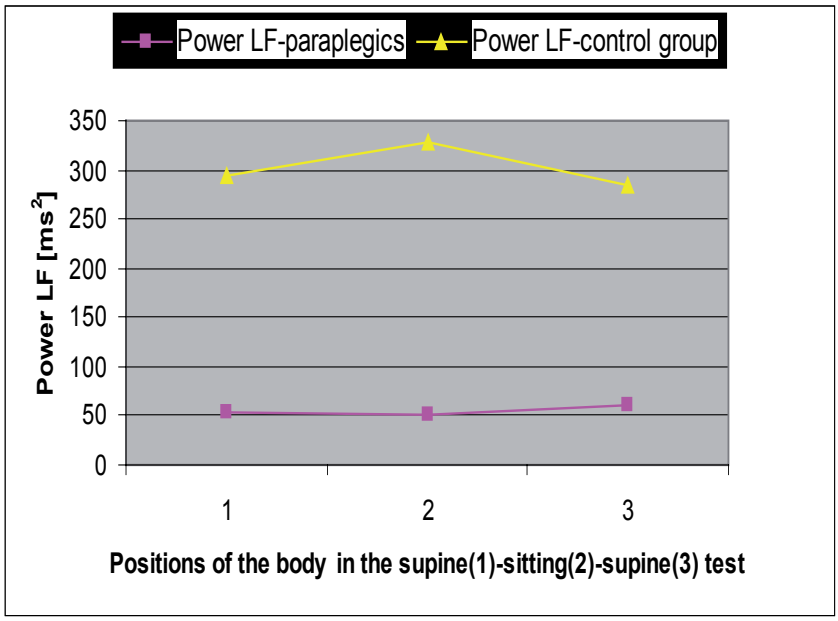


Fig. 2
Spectral power of the HF component in a group of paraplegics and age matched healthy controls in the supine-sitting-supine test

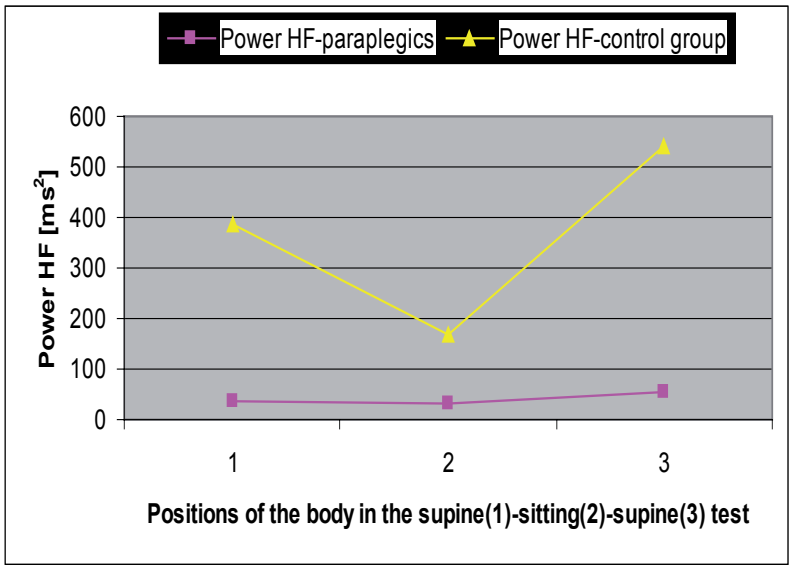


TABLE 1
Spectral power of the LF component in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test

LF [ms^2]		PARA	CONTR	p
1	mean	53.8	293.1	0.001
	SD	30.3	378.6	
2	mean	51.5	328.1	0.0013
	SD	42.8	350.7	
3	mean	61.8	283.2	0.003
	SD	40.4	398.5	

TABLE 2
Spectral power of the HF component in a group of paraplegics and age matched healthy controls in the supine-sitting-supine test

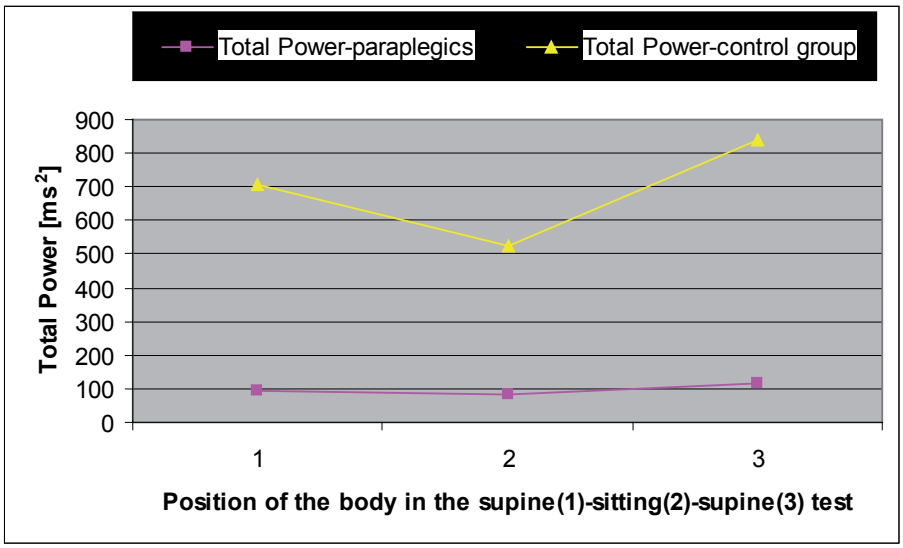
HF [ms^2]		PARA	CONTR	p
1	mean	38.0	387.9	0.0004
	SD	27.5	639.6	
2	mean	34.0	169.8	0.03
	SD	43.7	333.2	
3	mean	56.4	539.3	0.001
	SD	50.3	830.9	

Legend:
body positions in the supine-sitting-supine test: 1 – supine, 2 – sitting, 3 – repeated supine
PARA = paraplegics
CONTR = control group
LF = low frequency component of the spectral analysis of a heart rate variability (0.05–0.15 Hz)
Power LF [ms^2] = spectral power of the LF component of the SAHRV
HF = high frequency component of the spectral analysis of a heart rate variability (0.15–0.4 Hz)
Power HF [ms^2] = spectral power of the HF component of the SAHRV
p = level of significance

TABLE 3
Total spectral power (TP) in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test

TP [ms^2]		PARA	CONTR	p
1	mean	91.8	705.8	0.008
	SD	53.3	949.4	
2	mean	85.5	524.9	
	SD	67.0	717.9	
3	mean	115.6	840.3	0.007
	SD	80.8	1218.6	

Fig. 3
Total spectral power (TP) in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test

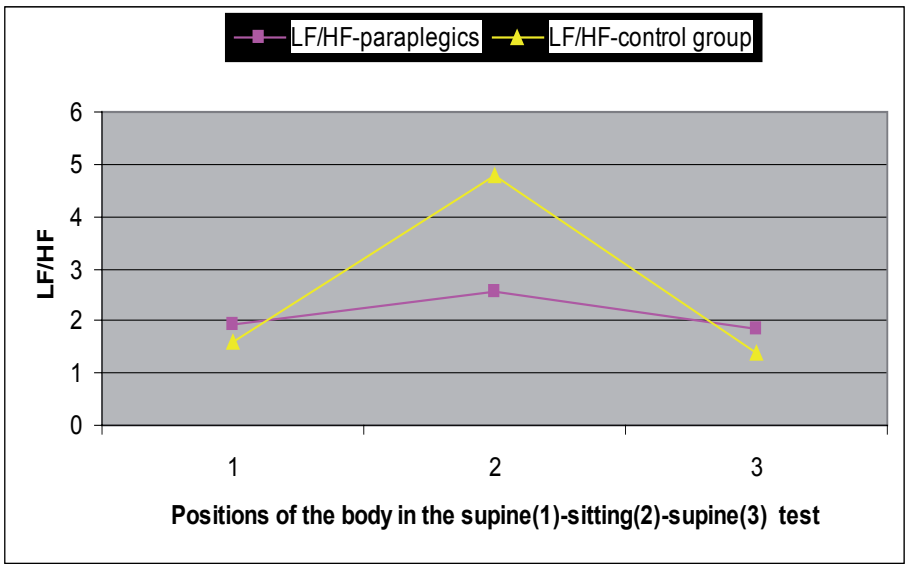


Legend:
body positions in the supine-sitting-supine test: 1 – supine, 2 – sitting, 3 – repeated supine
PARA = paraplegics
CONTR = control group
Total power [ms^2] = sum of the spectral power of the low frequency (LF) + high frequency (HF) components
p = level of significance

TABLE 4
Ratio LF/HF in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test

LF/HF		PARA	CONTR	p
1	mean	1.9	1.6	N.S.
	SD	1.0	1.4	
2	mean	2.6	4.8	N.S.
	SD	2.2	5.1	
3	mean	1.8	1.4	N.S.
	SD	1.4	1.6	

Fig. 4
Ratio LF/HF in a group of paraplegics and age-matched healthy controls in the supine-sitting-supine test



Legend:
body positions in the supine-sitting-supine test: 1 – supine, 2 – sitting, 3 – repeated supine
PARA = paraplegics
CONTR = control group
LF/HF = ratio of the low frequency (LF) and high frequency (HF) spectral power
p = level of significance
N.S.= non significant

TABLE 5
Questionnaire on autonomic functions in paraplegics

Patient	A	B	C
1	6	9	1
2	8	7	1
3	8	7	1
4	8	6	2
5	10	5	1
6	6	8	2
7	8	7	1
8	8	5	3
9	7	7	2
10	7	8	1
mean	7.6	6.9	1.5
SD	1.11	1.22	0.67

Legend:
A – answers for sympathetic responses
B – answers for parasympathetic (vagal) responses
C – indifferent responses

A ratio A/B (7.6:6.9) in paraplegics demonstrates a minimal (non significant) prevalence of responses for sympathetic function.

DISCUSSION

Heart rate variability has been investigated during postural stress as a means of identifying changes within the frequency spectra corresponding to a sympathetic stimulus (Vybiral et al., 1989) and vagal withdrawal. In the able bodied population, increase in the low frequency component of heart rate variability was registered and reported during postural stress and was associated with significant reductions in the high frequency component, suggesting augmented sympathetic and diminished vagal cardiac control (Montano et al., 1994).

Cardiovascular autonomic functions are markedly disturbed in SCI patients. It can lead, as one of the important factors, to an increase in mortality in these patients.

Time domain, amplitude, and power spectral analyses were used to study HRV and autonomic functions. The paraplegic subjects demonstrated a significant loss of the low frequency component during 24-hour HRV registration compared to able bodied controls. This was interpreted as being consistent with predominantly sympathetic denervation uninfluenced by the degree of physical activity (Bunten et al., 1998). The group with paraplegia demonstrated a significantly lower HF baseline and LF composite levels than controls (Grimm et al., 1997).

Decreased autonomic reactivity in patients after SCI shows a markedly decreased adaptation to orthostatic load. SCI patients are known to suffer from autonomic failure as a result of their injury (Bunten et al., 1998). We have described disturbed cardiovascular control in subjects after SCI, both in a supine position and during a situation with orthostatic load (sitting position).

A significant decrease in the power of LF and HF spectral components (in frequency domain) in patients after SCI (paraplegics) was found in our study. It corresponds to the results published by Ditor et al. (2005).

Furthemore, a registration of an orthostatic hypotension gives us important information for the rehabilitation strategy in patients after SCI. Paraplegic subjects also had significantly lower baroreflex effectiveness and greater blood variability, compared with the control group (Castiglioni, 2007). Abnormal blood pressure responses have been repeatedly described in these patients (Ditor et al., 2005). Therefore, a blood pressure measurement for the basic assessment of autonomic reactivity, in situations with different orthostatic load, should be performed in patients after SCI. Frequency analyses of autonomic function are related to clinical measures of autonomic control after SCI and provide useful noninvasive clinical tools with which to assess autonomic completeness of an injury following SCI (Claydon & Krassioukov, 2008).

CONCLUSION

1. A decrease in the reactivity of the autonomic nervous system to orthostatic changes, which evidences disturbances of cardiovascular regulation in patients after spinal cord injury (paraplegics) was found.
2. The reduction of the low-frequency component (LF) of the spectral analysis of heart rate variability reflects a lowered sympathetic activity in these patients in a sitting position. Furthemore, it reflects orthostatic disturbances in situations with body position changes.
3. An examination of the blood pressure in different body positions and the examination of autonomic reactivity by means of the SAHRV method contribute to the checking of the autonomic dysfunctions in patients after spinal cord injury.

ACKNOWLEDGEMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) “Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes”.

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SPEKTRÁLNÍ ANALÝZA VARIABILITY SRDEČNÍ FREKVENCE U PACIENTŮ S PORANĚNÍM MÍCHY

(Souhrn anglického textu)

VÝCHODISKA: Každoročně se v České republice vyskytne 200–300 nových poranění míchy (SCI). Někteří z těchto pacientů trpí autonomními poruchami, jež zasahují zejména jejich kardiovaskulární a genitourinární systém. Autonomní poruchy značně snižují kvalitu života pacientů s SCI. U těchto subjektů je důležité posoudit závažnost postižení autonomní nervové soustavy (ANS).

CÍL: Hlavním cílem této studie bylo posoudit spektrální analýzu variability srdeční frekvence jako indikátoru kardiovaskulární autonomní regulace u pacientů s poraněním míchy a porovnat ji s nálezy zjištěnými u zdravých kontrolních jedinců.

METODY: Této studie se zúčastnili paraplegici (průměrný věk 53,1 ±15,8 let, sedm mužů a tři ženy). U pěti z nich byla mícha poraněna částečně a u zbylých pěti zcela. Byla použita klasifikace ASIA (American Spinal Injury Association), modifikovaná Ashworthova stupni-

ce a Dotazník autonomních funkcí. Autonomní reaktivita byla hodnocena pomocí metody spektrální analýzy variability srdeční frekvence (SAHRV; krátkodobá registrace) za použití testu leh-sed-leh (supine-sitting-supine). Byl použit diagnostický systém VarCor PF7, což je inovace systému VarCor PF6. Kontrolní skupinu tvořilo dvacet čtyři subjektů (průměrný věk 51,9 ±9,4 roku).

VÝSLEDKY: U pacientů po SCI (paraplegiků) byl v rámci reakce na ortostatické změny zjištěn výrazný pokles reaktivity autonomní nervové soustavy. Ve srovnání se zdravými kontrolními jedinci byly u těchto pacientů během změn pozice těla potlačeny zejména charakteristické reakce nízkofrekvenčních (LF) a vysokofrekvenčních (HF) spektrálních složek. Navíc byl u těchto pacientů zaznamenán významný pokles spektrálního výkonu u LF a HF složek. Hodnota celkového výkonu (TP) spektra byla výrazně nižší ve skupině paraplegiků ve srovnání se zdravými dobrovolníky, a to jak při první pozici vleže, tak i při opakovaných pozicích vleže. Významná míra ortostatické hypotenze byla zaznamenána pouze u dvou paraplegiků v poloze vsedě. Menší zvýšení poměru LF/HF bylo zaznamenáno v poloze vsedě ve skupině paraplegiků ve srovnání se zdravými jedinci.

ZÁVĚRY: U pacientů s poraněním míchy (paraplegiků) byl zjištěn pokles reaktivity autonomní nervové soustavy na ortostatické změny, což dokazuje poruchy kardiovaskulární regulace. Snížení nízkofrekvenční (LF) složky spektrální analýzy variability srdeční frekvence u těchto pacientů reflektuje sníženou sympatickou aktivitu v poloze vsedě. Odráží ortostatické poruchy v situacích, kdy se mění poloha těla, což je spojeno se změnou ortostatického zatížení. Přesnější hodnocení autonomní dysfunkce u pacientů po SCI je podpořeno měřením krevního tlaku a SAHRV.

Klíčová slova: poranění míchy, spektrální analýza, variabilita srdeční frekvence, autonomní nervová soustava.

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THE INFLUENCE OF PARALYMPIC SCHOOL DAY ON CHILDREN'S ATTITUDES TOWARDS PEOPLE WITH DISABILITIES

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OBJECTIVES: The aim of this study is to determine the influence of Paralympic School Day on the attitudes of school children toward people with a disability; to analyze the basics and theories of Paralympic Education in school settings.

METHODS: The participants were 36 children with a mean age of 11.78 (17 boys and 19 girls) from the elementary school Hrdličky in Ostrava, the Czech Republic. All participants completed the questionnaire "Children's Attitude Toward Integrated Physical Education-Revised" (CAIPE-R) (Block, 1995) and the Adjective checklist before and after the implementation of the program.

RESULTS: The scores of the participants' general attitudes toward including people with disability in PE increased from 16.50 to 17.25, the mean scores of the adjective checklist increased from 19.81 to 19.92, but the scores of their attitudes toward changing sports rules for people with a disability decreased from 17.89 to 16.86, however, these changes were not statistically significant. Girls' attitudes toward people with a disability tended to be better both before and after the intervention.

CONCLUSION: Generally, Paralympic School Day can change participants' attitude toward people with disability, but when the specific activities are arranged, we have to take the participants' features under consideration. In order to have a consistent influence, a long term duration of the intervention should be arranged.

Keywords: adapted physical activity, physical education, sledge hockey, inclusion.

INTRODUCTION

When we trace the origins of the Paralympic and modern Olympic movements, we find a significant difference in the primary philosophies behind the two different movements. Educational value has been regarded as the most important value in the Olympic movement since the father of modern Olympics brought back the Olympic Games.

However, along with the evolution of human society, changes in attitudes toward people with disability, and the increasingly closer relationship between the International Paralympic Committee (IPC) and the International Olympic Committee (IOC), the Paralympic movement's educational value has had much importance attached to it. Besides creating a fair chance for people with disabilities to participate in sports competition, the IPC also explored the educational value of the Paralympic movement and is implementing the educational programs for it.

Generally, there are two types of forms of Paralympic education. A Paralympic Game based program means that the IPC works closely with the Paralympic Games Organizing Committees to assist them in the creation and delivery of an education program leading up to and continuing during the Paralympic Games (IPC, 2004a). Another important Paralympic educational model is the school based program. Both Olympic education and Paralympic education places much emphasis on youth in a school setting. Sir Philip Craven, the President of the International Paralympic Committee, suggested that schools are the ideal environment to lay the foundations for a better world. Children do not inherently harbor prejudices. For them "disability", with the negative connotations that are often entrenched in adult society, does not exist, only ability (IPC, 2004b).

Paralympic education in school settings can be traced back to 1993 in the U.S.

Paralympic Day in the Schools (PDIS) was a 3 year grant project awarded to the Atlanta Paralympic Organizing Committee (APOC) by the U.S. department of education, the office of special education and rehabilitative services. PDIS was conducted throughout the school year in the Atlanta area. Middle and high school students with mobility and visual disabilities and their peers without disabilities participated together in Paralympic activities. They were aided in these activities by trained adult mentors (Whilhite, Mushett, Goldenberg, & Trader, 1997, 133).

The Paralympic School Day is an educational program initiated by the International Paralympic Committee (IPC). The aim of the program is to create awareness and understanding in schools about persons with a disability. It is a set of activities that educate youth about Paralympic sport, individual differences and disability issues in a fun and playful environment. These activities can be organized during a normal school day and target an audience of young students between the ages of 6 to 15.

In 2004, the IPC, in close collaboration with the European Paralympic Committee (EPC), initiated a two year PSD pilot project in Europe. The project was made possible thanks to a significant grant of the European Commission within the framework of its "JOINT ACTIONS" program, linking together the EU programs of Leonardo da Vinci, Socrates, Youth and Culture 2000 to encourage projects which do not belong exclusively to the categories of education, training or youth. The following six partner organizations from six different European nations cooperated with the IPC and EPC to implement this pilot project: a) Catholic University of Leuven, Belgium; b) Palacký University, Olomouc, Czech Republic; c) University of Koblenz, Germany; d) Aristotle University of Thessaloniki, Greece; e) Latvian Disabled Children's and Youth Sport Federation, Latvia; f) Swedish Development Centre for Disability Sport, Sweden (IPC, 2004b).

To change participants' attitudes toward people with a disability is one of the most important aims of Paralympic School Day. Historically, people with a disability were always a group being discriminated against. The lives of persons with disabilities were portrayed as pitiable, lacking in worth, amoral, and even violent (Phillips, 1990). Disability has also been a metaphor for illness, expressed by such traits as dependency, weakness, depression, vulnerability, and helplessness (Fine & Asch, 1988). The social act of charity was motivated by pity, as persons with disabilities were identified with their losses (Shields & Anderson, 2003).

In correspondence with the implementation of Paralympic School Day, some studies have been done in order to assess the effect of the program. In the study directed by Panagiotou, Evaggelinou, Doulkeridou, Mouratidou and Koidou (2008), 178 children were distributed into a control group (n = 92) and an experimental group (n = 86). The experimental group received a day program, the Paralympic School Day. CAIPE-R was used for collecting data about the children's attitudes. The results show a significant improvement in general attitudes toward including people with a disability in PE. Van Biesen, Busciglio and Vanlandewijck (2006) examined the attitudes of 196 students by using CAIPE-R. Results indicated that the PSD program did influence the attitudes of nondisabled primary school students on the inclusion of students with disabilities in PE. Lucas et al. (2006) evaluated 48 participants' attitudes between before and after Paralympic School Day intervention by using CAIPE-CZ and the adjective checklist. Result show that PSD had an effect on the attitude of the most children, but the effect was not too big.

The purpose of the study was to determine the influence of Paralympic School Day on the attitudes of school children toward people with a disability; to explore how to spread Paralympic education in school settings under different cultural conditions.

METHODS

Participants

The elementary school where Paralympic School Day took place in Ostrava was selected for research purposes. In the Hrdličky school, participants were from grade 6 in two classes, of which 40 children filled in the questionnaires before the intervention and 36 of them finished filling in the questionnaires after the intervention. A subject group of 36 children was selected as the focus of research. In the group, there are 17 boys (mean age 11.88 years ±0.49) and 19 girls (mean age 11.68 years ±0.48).

Intervention

Paralympic School Day in Hrdličky school started at 8:30 a.m. Three sessions were selected for participants. The school's court, gymnasium, multimedia classroom, and basketball gym were provided by the school as the location for different activities. Students were divided into 2 groups (corresponding with their two regular classrooms). First, a speech about the Paralympic movement and sport for people with a disability was given to 2 groups from 8:30 to 9:15. Then they went to different activities at the same time. After 45 minutes, the two groups switched.

The Paralympic School Day in Ostrava was held in preparation for the 2009 Sledge Hockey World Championship in Ostrava. A sledge hockey player from the Czech Republic was invited to give a short speech about his experience with Sledge Hockey.

Session one: Lecture on the topic of sport for people with a disability

In this part, videos of the summer and winter Paralympics, Deaflympics and the Special Olympics were shown students in order to let them get a general impression of sport for people with different disabilities. Lecturers made a speech after each video clip, and explained the differences among those activities. A sledge hockey athlete from the Czech Republic gave them a speech about his training and experience in the Para-

lympics. Students then asked questions about sport for people with a disability.

Session two: Boccia

In this session, students were taught the basic rules of boccia, told who plays boccia, and familiarized with the fundamental skills of boccia. Official boccia equipment was shown to them in this session. The general goal was for students to gain respect for those sporting abilities related to the precision and strategy requirements for the sport of boccia.

Session three: Wheelchair basketball

In this part, students were taught some of the basic rules and traits of wheelchair basketball. Then some drills were implemented in order for them to practice the fundamental skills for wheelchair basketball, such as shooting, passing and dribbling. After the drills, the students were divided into two teams to play a competition. The general goal in this session was for students to gain respect for the sporting abilities of wheelchair basketball athletes and achieve an understanding of what team sport in a wheelchair involves. Wheelchairs for wheelchair basketball were used in the session.

In the end, all participants, teachers, and presenters in the Paralympic School Day came together in the basketball gym or court. A wheelchair basketball competition between the school and the committee of PSD was organized for 15 minutes.

Instruments

We used questionnaire CAIPE-CZ (modified from CAIPE-R, Block, 1995) and the adjective checklist (Siperstein, 1980). According to Block (1995), the CAIPE-R is generalizable to more than one disability label and appears to be a valid and reliable instrument for measuring the attitudes of children without disabilities toward including children with disabilities in physical education. The original version of the CAIPE, a validated attitude survey with an internal reliability coefficient of 0.37, a test-retest reliability coefficient of 0.78 for the general attitude scale, and a 0.66 internal and 0.56 test-retest reliability coefficients for the sport specific scale, is designed to measure children's attitudes toward having students with disabilities in their regular physical education class (Block, 1996). Questionnaire CAIPE-CZ is the translation of the questionnaire CAIPE-EU, which is a modified version of the CAIPE-R questionnaire (Block, 1995).

Siperstein's (1980) adjective checklist was developed in order to assess children's judgments of the attributes of peers with disabilities. Thirty four adjectives (17 positive and 17 negative) are given. Children have to indicate which adjectives they associate with the child with an impairment. They can circle as many adjectives as they want. The total score is calculated by subtracting the number of negative adjectives from the number of positive adjectives and adding a constant of 20. A summary score below 20 indicates a relatively negative attitude and a score above 20 is associated with a positive attitude. The construct validity of the adjective checklist was established by means of two factor analyses (Siperstein, 1980). The first one was done with 2,000 children, ages 8 to 14, who used the checklist four times to describe three children with disabilities (mental retardation, emotional disturbance, and orthopedic disabilities) and their best friend. The second one was done with 770 children who used the checklist once to describe one randomly drawn target child with blindness, deafness, mental retardation, emotional disturbance, or orthopedic impairment. Alpha reliability coefficients for these two studies were 0.81 and 0.61, respectively. All participants completed the questionnaire "Children's Attitudes Toward Integrated Physical Education-Revised" (CAIPE-R) (Block, 1995) and the adjective checklist (Siperstein, 1980) within one week before and one week after the implementation of the program.

Data analysis

Preintervention data were collected within one week prior to and post intervention data within one week after the intervention. Statistics were calculated by using SPSS 11.5, both non parametric tests and parametric tests. The Wilcoxon paired sample T-test was used to compare the difference in participants' attitudes between preintervention and postintervention with a statistical significance value of $p \leq 0.05$. One way ANOVA was used was to analyze the influence of gender.

RESULTS

In elementary school Hrdličky, basic information about participants showed that 8 of them had a family member or close friend with a disability, 3 of them had a peer with a disability in their regular class, and none of them had a peer with a disability in their P.E. class. Most children (n = 25) were "kind of competitive", one of them was very competitive, and 10 of them were not competitive at all.

The results of the ascertainment of participants' attitudes from the questionnaire CAIPE-CZ are divided into two parts, because the questions 3 to 8 are for testing the attitudes of elementary school children towards the integration of a student who uses a wheelchair in physical education (PE) and questions 9 to 13 are aimed at testing the attitudes of elementary school children towards the adaptations of rules in basketball for the inclusion of a student who uses a wheelchair.

TABLE 1
Independent T-Test for attitude comparison between boys and girls

	Pre-test	Boys Post-test	Difference	Pre-test	Girls Post-test	Difference
Attitudes toward inclusion in PE						
M	15.76	15.82	0.06	18.37*	19.32	0.95
SD	4.51	4.81		3.29 .	3.67	
Attitudes towards changing the rules						
M	16.35	15.59	–0.76	19.26	18.00	–1.26
SD	6.83	7.79		1.56	1.86	
Checklist						
M	19.35	18.65	–0.70	20.21	21.05	0.84
SD	4.52	5.30		2.46	2.46	

Legend:
M – arithmetic mean
SD – standard deviation
*** p < 0.05 the difference is statistically significant**

TABLE 2
Wilcoxon Paired sample T-test for Comparison between pre and post intervention

		N	Mean rank	Sum of ranks
Attitudes toward inclusion in PE	Negative Ranks	9	11.78	106.00
	Positive Ranks	17	14.41	245.00
	Ties	10		
	Total	36		
Attitudes towards changes in the rules *	Negative Ranks	22	13.80	303.50
	Positive Ranks	5	14.90	74.50
	Ties	9		
	Total	36		
Checklist	Negative Ranks	14	12.14	170.00
	Positive Ranks	14	16.86	236.00
	Ties	8		
	Total	36		

Legend:
*** p < 0.05 the difference is statistically significant**

From TABLE 1, we can find that girls had more positive attitudes toward people with a disability than boys. The scores of girls' attitudes toward inclusion in PE were 18.37 before intervention and 19.32 after intervention, which were both better than the boys' scores. The differences in scores between boys and girls in preintervention were statistically significant ($p = 0.039$). The scores of the girls' checklist were 20.21 before the intervention and 21.05 after the intervention, which were better than the boys' scores. What's more, the scores of those girls' attitudes which increased after the intervention were higher than those of the boys.

By perusing TABLE 2, we can find out that 17 participants' attitudes toward inclusion in PE were changed positively, 9 participants' attitudes toward inclusion in PE were changed negatively, 22 participants' attitudes toward changing the rules for people with a disability were changed negatively, and 14 participants' scores of the checklist were changed positively. The results show that the intervention influences participants' attitudes toward inclusion in PE positively.

DISCUSSION

Paralympic education in school settings is a good idea for spreading the philosophy of the Paralympic movement. According to the firm belief and with the support of the IPC and EPC, the Paralympic School Day has already been implemented in some European countries for almost 5 years. It provides a really good example of how to organize a Paralympic education program in school settings. Many studies from different countries in Europe with respect to PSD have proven that this intervention can really play a positive role in improving participants' attitude toward people with disabilities.

Results of this study also reinforced the assumption that a Paralympic School Day can change participants' attitudes toward people with a disability positively (Ješina et al., 2006; Panagiotou et al., 2008; Van Biesen, Busciglio, & Vanlandewijck, 2006). In spite of the fact that only in some questions were the differences in attitudes statistically significant, the trends were positive in the cases of all questions. Participants were given speeches by experts and experienced different sports for people with a disability. An increase in familiarity with sports for people with a disability, positive feelings and information from experts together played an important role for this improvement. In the result, we also found that girls had more positive attitudes than boys did, no matter whether in pre or post intervention. In this case Fishbein (1996) speculated that girls were socialized to be more nurturing and responsible toward dependent individuals than were boys. There was a difference between girls and boys with respect to overall attitude scores toward peers with disabilities. Several researchers support the finding that girls have generally demonstrated more favorable attitudes toward peers with disabilities than have boys (Hazzard, 1983; Voeltz, 1982; Van Biesen & Vanlandewijck, 2006). Gender differences favoring females is also reported in attitude research with adults (Yuker, 1988).

Contrary to our assumption, attitudes toward adaptation of sports rules for people with a disability after intervention tended to decrease. The same phenomenon was found in Ješina et al. (2006) and Panagiotou et al. (2008). Although participants' attitudes toward inclusion in PE were changed positively through the intervention, they still did not want to change the rules of any game. A hypothesis for this decrease is that the participants had no idea about sport for people with a disability so they didn't know before what it would be like to change sports rules for people with a disability. However, after trying sport for the disabled, they felt that it was hard to play a game using the adapted rules, so they then felt unfavorable towards changing the rules. In the intervention, wheelchair basketball was chosen as the Paralympic sport to be tried out for participants, which was really hard for children aged from 11 to 12, because they can't shoot a basket from a sitting position.

Study limitations are as follows: a) the small number of participants as there was a total of 36 students participating in the study. In order to evaluate the program's effect better, more participants should be involved; b) the short time of the intervention: we arranged an intervention of only one day in duration. In order to have a long term effect, a longer duration of the intervention should be carried out; and (c) wheelchair basketball: we used wheelchair basketball for participants, but because of their ages, they can't shoot the basketball from a sitting position, which made them feel a little frustrated.

CONCLUSION

Generally, Paralympic School Day can change participants' attitude toward people with disabilities positively. However, contary to our assumption, participants' attitudes toward changing sports rules for people with a disability were changed negatively, which caused us to reconsider the criteria for choosing a suitable Paralympic sport in order to lead to a positive influence on participants attitudes' toward a change of the rules. Girls had a better attitude toward people with disabilities than boys before, during and after the intervention, which reinforces the validity of the results of previous studies. When the specific activities are arranged, we have to take participants' features into consideration. In order to have a consistent influence, longer term duration of the intervention should be arranged.

ACKNOWLEDGEMENT

The study has been supported by the research grant from the Ministry of Education, Youth and Sports of the Czech Republic (No. MSM 6198959221) "Physical Activity and Inactivity of the Inhabitants of the Czech Republic in the Context of Behavioral Changes".

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VLIV PARALYMPIJSKÉHO ŠKOLNÍHO VZDĚLÁVACÍHO PROGRAMU NA POSTOJE K OSOBÁM SE ZDRAVOTNÍM POSTIŽENÍM

(Souhrn anglického textu)

CÍLE: Cílem práce bylo zjistit vliv paralympijského školního vzdělávacího programu na postoje k osobám se zdravotním postižením a analýza základů a teorií spojených s paralympijskými vzdělávacími programy.

METODIKA: Naší studie se účastnilo 36 žáků (17 chlapců, 19 dívek) ze základní školy A. Hrdličky v Ostravě. Ke zjišťování postojů jsme použili české verze dotazníků CAIPE-CZ a ADCL (Adjective checklist).

VÝSLEDKY: Postoje k začlenění žáků s postižením do školní TV se vlivem programu PŠD zlepšily z 16,50 na 17,25. Postoje k osobám se zdravotním postižením se zlepšily z 19,81 na 19,92, ale postoje ke změně pravidel v basketbalu se zhoršily z 17,89 na 16,86. Žádné z těchto změn však nebyly statisticky významné. Postoje dívek byly také pozitivnější než postoje chlapců před i po realizaci PŠD. Postoje dívek byly lepší před intervencí i po ní.

ZÁVĚRY: Paralympijský školní den má pozitivní vliv na postoje k osobám se zdravotním postižením, ale pro optimalizaci dopadu popsané intervence je potřeba modifikovat vlastní program s ohledem na věk a charakter účastníků. Pro prohloubení dopadu tohoto vzdělávacího programu doporučujeme prodloužit délku intervence.

Klíčová slova: aplikované pohybové aktivity, tělesná výchova, sledge hokej, integrace.

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AUTHOR GUIDELINES

FOCUS AND SCOPE

The journal "Acta Universitatis Palackianae Olomucensis. Gymnica" focuses on presenting results of research studies and theoretical studies from the field of kinanthropology. The scope of the journal covers topics related to biomechanics, exercise physiology, physiotherapy, somatometry, sports psychology, sports training, physical education, public health, etc. The journal also welcomes submissions that present results of interdisciplinary research.

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The main language of the journal is English. Article title, abstract, and keywords are published also in Czech. All texts submitted to the journal are accepted only in English. Czech speaking authors are required to provide article metadata both in English and Czech. In Non-Czech speaking authors, the Czech version of article metadata will be completed by the journal.

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The submission file is in Microsoft Word (.doc) document file format. The text is single-spaced, left justified, uses 12-point Times New Roman font, and all illustrations, figures, and tables are placed at separate pages, rather than within the text. The maximum length of a submission allowed is 15 pages in total.

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Tables and figures are placed at separate pages, rather than within the text. In addition, illustrative figures (if possible in high resolution; e.g., uncompressed TIFF) should also be uploaded as supplementary files with the submission and their file names should contain the number of the figure (e.g., figure01.jpg, figure02.tiff). In the text, place an identification above each table and figure. The identification is left justified and consists of a label (e.g., TABLE 1, Fig. 1) on the first line and a title of the table or figure starting on the next line.

References

References are placed at the end of the submission in alphabetical order and must comply with the APA style (see examples on www.gymnica.upol.cz). Footnotes can never be used for references. Carefully check references to assure they are correct and included only when they are cited in the text. Only references which have been published or accepted for publication can be included. Where available, provide URLs for the references.

We look forward to our further cooperation!

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Soubor příspěvku je ve formátu souboru Microsoft Word (.doc). Text má jednoduché řádkování, je zarovnaný doleva, používá dvanáctibodový font Times New Roman a všechny ilustrace, obrázky a tabulky jsou umístěny na samostatné stránky. Maximální povolená délka příspěvku je 15 stran celkem.

Abstrakt a klíčová slova

Doporučená délka abstraktu je 300 slov a neměla by přesáhnout 400 slov. Pokud je to možné, bude abstrakt strukturován do následujících částí: VÝCHODISKA, CÍLE, METODIKA, VÝSLEDKY (včetně relevantní statistiky) a ZÁVĚRY. Autoři uvedou 3 až 10 klíčových slov (nepoužitých v názvu příspěvku).

Struktura příspěvku

Typický článek je strukturován následujícím způsobem: ÚVOD, METODIKA, VÝSLEDKY, DISKUZE, ZÁVĚRY a REFERENČNÍ SEZNAM. Názvy kapitol jsou napsány velkými písmeny a zarovnány doleva.

Tabulky a obrázky

Tabulky a obrázky budou umístěny na samostatných stránkách. Obrázky a ilustrace (pokud možno ve vysokém rozlišení, např. nekomprimovaný TIFF) by měly být nahrány spolu s příspěvkem jako doplňkové soubory a názvy těchto souborů by měly obsahovat číslo obrázku (např.: figure01.jpg, figure02.tiff). V textu umístěte nad každou tabulku a obrázek identifikaci. Identifikace je zarovnaná doleva a sestává z popisku (např.: TABLE 1, Fig. 1) na prvním řádku a názvu tabulky nebo obrázku začínajícím na dalším řádku.

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Těšíme se na další spolupráci!

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ACTA
UNIVERSITATIS PALACKIANAE OLOMUCENSIS
GYMNICA

Vol. 40 No. 2

Published by Palacký University, Olomouc 2010

Preparation and arrangement before print: Mgr. Zuzana Hanelová, Iva Tezzelová, & František Chmelík
Technical Editor and graphic arrangement: RNDr. Anna Petříková

Published quarterly
MK ČR E12792

Electronic form available on address: http://www.gymnica.upol.cz

ISSN 1212-1185