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# THE LITHUANIAN CONTEXT OF PARTICIPATION OF THE DISABLED IN HIGHER EDUCATION

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**Background.** The policy concerning the integration of the disabled in higher education is very important precondition of participation and the needs and rights of disabled students as higher education learners have been officially recognized in many countries by their legislation. But achieving positive miscellaneous support in order to overcome the barriers for participation of disabled students in higher education requires far more than legislative change. The access and participation have multi-layered context encompassing physical, attitudinal and curricular issues related to physical environments, earning capacity of disabled students, entrance to higher education, institutional support, assistive technology or adapted lecturing-learning material, the training of staff to support disabled students. The present study is devoted for analyzing and identifying the mentioned above problems at the current national policy, institutional universities' and individual students' level regarding the possibilities, real provision and practice of disabled students in higher education in Lithuania.

**The goals.** 1) To analyze the national and delegated legislation concerning the rights, equal opportunities and financial support of disabled in higher education; 2) To present the national data regarding the general extent and distribution of disabled as well as study programs mainly chosen by disabled persons according to the type of disability in university education; 3) To evaluate the adaptation of physical environments and technological supply meeting the special needs of disabled students on national higher education level; 4) To ascertain the main barriers and positive factors for successful higher education of disabled from the findings in single specified university study program.

The methods and organization: 1) The content analysis of Lithuanian legal acts; 2) The inquiry of Lithuanian universities; 3) The inquiry of disabled students participating in Adapted physical activity (APA) study program. Nine of all 15 Lithuanian universities responded to the inquiry. All twenty APA students responded to the inquiry.

**Results:** Lithuanian policy declaratively assure the equal opportunities and equal conditions for disabled in higher education, but up to now and in future up to 2010 there is not foreseen any measure for implementation of the policy. On an average the disabled students comprise 0.24% off the total number of students (84279) in the universities investigated. The mostly of all (204) disabled students in universities investigated have had permanent internal disorders (42.7%), physical (25.5%) and combinative (23%) disabilities as to compare with those having hearing (4.9%) and visual (3.9%) ones. Generally, the students with physical disabilities chose the study programs in the fields of APA, pedagogy, psychology, law, management, languages, mechanics, engineering, mathematics. Those with hearing disabilities selected the study programs of APA, religion sciences, arts and architecture. The visually disabled students preferred the ones in law and history. The majority of universities investigated have unequipped physical environments, limitation in technological means. The disabled APA students indicated that main positive factors for entering and successful studies in higher education should have to be the well-rounded information about the study program and positive attitudes of staff, disabled student teacher and student-peer relationships.

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## BREATHING EFFECTS ON FRONT CRAWL STROKE KINEMATICS IN SWIMMING

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The aim of the present study was to determine the effects of breathing and breath-holding on the 3D underwater stroke kinematics of front crawl swimming. In front crawl swimming, head movements should be coordinated with body roll to reduce the tendency for swimmers to lift their head out of the water for a breath (Maglischo, 1993). Costill et al. (1992) introduced that swimmers recover their arm higher and more linearly on the breathing side and use somewhat lower and more lateral swing over the water on the non-breathing side. Payton et al, (1999) reported that (6 male competitive) front crawl swimmers performed the front crawl breathing action without greatly altering the timing of the four underwater phases of the stroke.

Ten female competitive freestyle swimmers participated in the study. Each subject swam 6 front crawl trials of 25 m at a constant speed under breathing and breath-holding conditions. The underwater motion of each subject's right arm was filmed using two S-VHS cameras, operating at 60 fields/s, which were positioned in front of two underwater viewing windows. The spatial coordinates of selected points were calculated using the DLT procedure with 30 control points (RMS values: 4.4, 4.6 and 7.2 mm in the X, Y and Z directions, respectively) and after the digital filtering of the raw data with a cut-off frequency of 6 Hz, the hand's linear displacements and velocities were calculated.

The analysis of the data revealed that when swimmers performed the breathing trials, the time to complete the arm stroke, the backward hand displacement relative to the water and the lateral displacement of the hand in the X — axis during the downsweep were significantly increased, while peak backward hand speed during the insweep and the displacement of the hand during the push phase were greatly reduced. Moreover, the total displacement of the hip during the stroke was significantly increased by an average of 6%.

	Breathing	Breath-holding	t - value
Total underwater pull (s)	1.25 ± 0.17	1.16 ± 0.15	2.764 *
Absolute pull length (cm)	54.4 ± 4.99	48,1 ± 7.87	2.471 *
Downsweep (cm)	9.17 ± 4.73	6.19 ± 5.56	2.638 *
Max vel the insweep (m.s <sup>-1</sup> )	1.84 ± 0.11	2.09 ± 0.40	-2.368 *
Push (cm)	5.80 ± 4.16	11.8 ± 6.58	-2.297 *
Total displac. of the hip (cm)	159.4 ± 18.2	150.1 ± 23.9	2.619 *

\* p<.05

The results of the present study revealed that breathing action and body roll affects the movement pattern and influences stroke mechanics. When female swimmers performed the breathing action they increased significantly their timing of the total underwater pull without any change during the insweep and push phase. These results should be taken into account by coaches in order to better understand the technical effects of moving arm position and breathing action and co-ordination.

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## ANALYSIS OF WORLD ELITE CANOEISTS COMPETITION ACTIVITY OF 2005

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Sports practice and theory emphasizes the problem of training session management, although it does not receive adequate attention yet. The analysis of competition activity which helps to seek for high sports results should be a matter-of-course task and should serve as a basis designing viable programs of the preparation of sportsmen. Comparing individual or team indicators of canoeists with the model ones lets us establish the direction for further improvement and thus brings in certain adjustments in the plans of training sessions.

The issues of tactics and strength distribution have been analyzed in modern sports theory and practice (Barisas et al., 1994; Issurin, 1998; Raslanas et al., 2004), and they are critical in seeking high results. Nowadays, when there are tight-knit results of winners and prize-winners, winning is possible only when the right tactics is chosen and when strength is equally distributed throughout the distance. So it is *relevant* to investigate the tactics of most powerful world canoeists and the peculiarities of changes in speed while covering the distance.

**Research aim** is to analyze the competition activity of world canoeists of 2005.

**Research methods:** analysis of literature, analysis of competition records, mathematical statistics.

**Organization of research.** The technical records of the youth and adult European championships, as well as the youth under 23 years of age European championships, were analyzed, where the time of covering 1000 m and 500 m in separate ranges (every 500 and 250 m) was recorded. The average speed of medal winners, men (n = 60) and women (n = 30), were analyzed, as well as the changes in speed in different distance ranges compared to the average speed of the whole distance. The changes of speed and the variants of tactics of crews winning different places and using different canoes (single and two-men) were compared.

**Research results.** It was established that the most often applied variant of tactics among women canoeists was 1—2—3—4, which was used by 58.6 per cent of the crews, and variant 1—2—4—3 (17.2 per cent). We can claim that women cover the distance with gradually decreasing speed.

Men canoeists medal winners most often applied tactical variant 1—2—3—4 (48.4 per cent of the crews) and 1—3—4—2 (16.1 per cent). 20.0 per cent of men-medal winners applied 1—2—3—4 tactical variant, 23.3 per cent used 1—3—2—4, and 20.0 percent applied 1—3—4—2 tactical variant.

The sportsmen who took the first place covered the distance more gradually compared to those sportsmen and crews who took the second and the third places. Among men medal winners some of them covered the second range of the distance faster than the first in the 500 m distance, and most often they were from the group of juniors and youth. All women canoeists, individual and crews, faster covered the first range of the distance than the second one in the distance of 500 meters.

# AEROBIC CAPACITY OF AEROBICS GYMNASTS WITH DIFFERENT ABILITIES

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## Introduction

Aerobic gymnastics (the name of discipline was changed in 2005) is the ability to perform continuous complex and high intensity movement patterns to music. Originated from the traditional aerobic classes, aerobic gymnastics routine must continuously integrate the performance of physical qualities like coordination, flexibility and strength with the perfectly executed traditional aerobics movements (*Federation Internationale de Gymnastique*, 2004). The aim of this study was to characterize aerobic capacity of aerobic gymnastics athletes with different level of training during continuous increasing exercise.

## Methods

Lithuanian women aerobic gymnasts participated in this study. According to performance (training) level they were divided in two groups: well trained (WT) and moderately trained (MT). All the subjects underwent maximum physical exercise (increasing run) with continuous intensity on the treadmill (Tunturi<sup>®</sup>, Finland). Pulmonary gas exchange parameters were continuously measured using the telemetric equipment ("Oxycon Mobile"), heart rate was registered with *Polar Accurex-plus*.

## Discussion

In determining the aerobic capacity of aerobics athletes of different mastership, we have observed that the period of training of moderately trained (MT) aerobics athletes was several times shorter than that of the subjects of the well trained (WT) group though there were hardly any changes in the mean indices of their  $VO_{2max}$ . It is probably that the insignificant  $VO_{2max}$  values of aerobic athletes of the WT group have been influenced by the fact that before taking up aerobic gymnastics the latter have been practicing artistic gymnastics for a number of years. According to Kirkendall D. T. (1985), the aerobic capacity of athletes engaged in artistic gymnasts was a low one compared to that demonstrated by representatives of other kinds of sports, though Montgomery & Baudin (1982) have found the  $VO_{2max}$  of the representatives of artistic gymnastics who had achieved a high level of mastership to be from 49.3 to 50.3 ml/kg/min. The  $VO_{2max}$  values of our subjects were lower by 22.5% compared to the data of Spanish scientists who had studied representatives of aerobic gymnastics with three world champions among them (Rodriguez et al., 1998). The latter difference may have been determined by the mastership level of the athletes studied as well as by genetic factors and the volume of training loads.

## Summary

The aim of this study was to characterize aerobic capacity of aerobic gymnastics athletes with different level of training during continuous increasing exercise. The subjects were 15 aerobics gymnastics athletes. All subjects performed maximum physical exercise (increasing run) on the treadmill. The HR values were continuously recorded by Polar HR monitor Accurex Plus, to establish respiratory gas exchange telemetric equipment "Oxycon Mobile" (Jaeger, Germany) was used. The results showed that maximum and submaximum respiratory gas exchange and HR values during the continuous incremental treadmill test were similar in groups of aerobic gymnastics with different level of training.

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## THE ROLE OF SPIRITUALITY IN THE TRAINING OF JUDO SPORTSMEN

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**Problem of investigation.** When investigating the problems of spirituality and education the representatives of various scientific fields give preference to art which they find to be the strongest spiritual value. It is widely recognized that the education of ethical values should be closely related with the teaching process in educational institutions. However, the education of spirituality through sport activity seems to be ignored. May the art of fighting affect the moral evolution of the personality? To be more precise, what role do judo sportsmen and trainers play in the person's education of spirituality and morality?

**The aim of research:** to find out what role judo sportsmen and trainers play in the education of spirituality and morality during training hours.

**Methods of research:** exploration of scientific sources, questionnaires, mathematical statistics (an expression of results in percentage).

As the questionnaires the anonymous closed type worked out at Vilnius Gediminas Technical University in 2003 was used; 80 respondents participated in the project among whom there were 40 judo trainers and 40 sportsmen and sportswomen (from 16 to 21 years old) of higher or high skills.

### **Analysis of research results:**

The results showed that the absolute majority — 95% of trainers and 83% of sportsmen — were convinced that spirituality makes an inseparable part of judo sport. However, 55% of trainers and 71% of sportsmen claimed that during training hours the education of spirituality and morality does not meet-sufficient attention. 60% of trainers and 94% of sportsmen believe that victory is achieved with the help of physical rather than spiritual preparation.

Trainers (58%) think that the most important factor before and during the competition is the sportsman's desire to win; as the second factor they consider the sportsman's spiritual state and concentration (45%).

The majority of the respondents regard the evaluation of the rival and his\her state and discipline as an unimportant factor in the strife for victory.

Among the most important traits of the judo masters the trainers mentioned patience, honesty, justice, attention and tolerance. Among the least important ones they found lenience and compliance.

The sportsmen think that the judo masters should be attentive (70%), patient, honest, just and tolerant. They also find lenience, sympathy, compassion and compliance to be of little importance. As they claim, the most important moral traits are diligence, persistence, dutifulness and friendliness. As a rule, they exclude complaisance.

The trainers are convinced that for them the most important traits are diligence (80%), persistence, dutifulness, courage and responsibility. The least important ones for them are modesty, complaisance, moderation and sensitivity. They think that the most typical moral traits of the trainers are tolerance, devotion, patience, love and compassion. The sportsmen, in their turn, argue that their most typical moral traits are love, devotion and goodness.

All the respondents agree that compliance and altruism are not typical to either of them.

68% of questioned sportsmen would like to learn more about judo philosophy. Only 15% think that they know it sufficiently. Meanwhile, 18% are chiefly interested in the sport aspects of judo. The great majority of sportsmen consider the trainer to be the main source of such information. 37% of sportsmen try to find such information independently. 15% claim that it is nearly impossible to find such information. 52% of trainers argue that they begin the teaching with concentration, the explanation of the importance of ethics and respect for the rival, others start with the history of judo and the falling and throwing technique.



52% sportsmen maintain that learning has no actual impact on the sport results. 26% think that the students who have better results in their studies achieve better results in sports. However, 24% of sportsmen claim that, on the contrary, the students who are not as good at their studies achieve better results in sports.

The absolute majority of the sportsmen (90%) regarded the bow ritual before the rival, partner, trainer or a judo beginner to be a sign of respect and not merely a necessary requirement or a remnant of the Japanese tradition.

**Conclusions:**

1. The majority of respondents consider the education of spirituality and morality to be an important and necessary factor in the training of judo sportsmen. However, they think that it is given too little consideration in Lithuania.

2. According to the answers of the respondents, the most important traits of the judo masters should be patience, honesty and justice.

3. Compliance and altruism are rather insignificant for the judo masters.

4. A greater part of sportsmen are eager to learn more about judo philosophy. 37% are interested in it and get acquainted with it independently. 18% stress the difficulty of finding such information.

5. 90% of sportsmen in the bowing ceremony find an expression of respect.

## SPORTS OF PEOPLE WITH DISABILITIES: PROBLEMS AND THEIR SOLUTIONS IN LITHUANIA

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The disabled sports as well as sports in general is divided into the organisation and the elite one, where people despite of their disability have all possibilities to take part in the contests on the national and international level.

The aim of our work is to establish whether the disabled sportsmen, as well as healthy sportsmen have equal opportunities to go in for sports and are fully integrated into the disabled sports system.

**Participants and the research procedure.** Anonymous survey was carried out, therefore a special and approved questionnaire was prepared. Some 126 respondents took part in the survey: 76 healthy and 50 disabled sportsmen, who take part in the national and international contests. The data was approved by statistical and mathematical methods — SPSS 11 for Windows package.

**Results.** Despite the health condition, the absolute majority of the polled sportsmen (92.9%) think that their life is meaningful and are happy about their life. Even 86.5% think that sports helps them to realise themselves and some 50% of the polled irrespective of the type of disability claim that “belief in sports give meaning to their life”. However we noticed that such indicators as the feeling of happiness, self esteem and self awareness was quite lower of the people with disability ( $p < 0.05$ ) than that of healthy sportsmen. When assessing the support of sports institutions to the disabled sportsmen, it was established that only 3.2% of them are financially supported. Even 50% of the disabled sportsmen have no permanent coach and just 15.6% are provided with services by a qualified coach. According to 57% of the polled the majority of sports facilities are not suitable for the disabled. More than half (52%) of the disabled respondents mentioned that they pay for training facilities themselves. The expenses of sports facilities, transport were covered for just 48% of the disabled who took part in the survey. It is quite a problem for the disabled to get the required inventory: just 10.3% of the polled stated that they are well provided with the inventory and 12.7% that they are fully provided with sportswear.

**Conclusion.** On the basis of the carried out research one could draw a conclusion that the disabled sports in Lithuania is considered to be of low social prestige, it is poorly funded, it lacks qualified coaches, the services of provided by sports medical staff and psychologists.

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## PHYSICAL EDUCATION AND HEALTH OF CHILDREN FROM CHILDREN'S FOSTER HOME

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In Lithuania about 6000 inmates live in children's care home, but their health and lifestyle is problematic. There is no data about relationship between their physical training and health.

**The aim** of the investigation was to study the physical training and health of children's care home inmates.

Both boys and girls residing in the cities, towns and rural children's care home districts were surveyed. Data were collected randomly using anonymous questionnaire from 20 children's care home. In total, the number of respondents was 1010: 518 boys and 492 girls. The data was processed with statistical EPI INFO 2002 software.

It was established that 22.6% of respondents evaluate themselves as "very healthy", 47.1% — as "healthy" and 30.3% — as "not very healthy".

Boys and girls evaluate their health in the same manner ( $p > 0.05$ ).

Most of the children have complained headache and dizziness, weakness, nervousness, sleeplessness and stomachache. The children have taken medical advice and medicine due to these complaints.

Physical education lessons were popular for 90% of children. 28.5% of boys and 15.7% of girls ( $p > 0.05$ ) did exercise everyday in their free time, 43.1% of boys and 51.8% of girls did exercise 1—3 times a week ( $p > 0.05$ ).

18.5% of boys and 15.7% of girls ( $p > 0.05$ ) take sport in various athletic clubs, mostly middle school age boys (28,5%) and older school age girls (23.6%).

Number of girls who take exercise increased with age.

It was established that children were injured during sport (accordingly 10.3% of boys and 2.0% of girls).

The health programme promoting physical training was prepared for children. This programme was oriented to children who evaluate themselves as "not very healthy". During second investigation after 10 months it was established that number of complaints decreased by 11%, number of taking medical advice by 16% and taking medications by 23%.

It was established that between physical training and health is strong link. Taking exercise helps to promote health, harden the organism and helps to decrease morbidity risk.

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## PRIMARY SCHOOL CHILDREN'S PHYSICAL ACTIVITY IN LEISURE

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The aim of this study was to determine the place of physical activity among leisure activities of primary school children.

The subjects of this investigation were 80 pupils: 40 boys and 40 girls. The parents of the pupils filled in the questionnaire of 33 questions about their children's leisure activities and to which activity they give priority.

43.7 of boys and 47.8 of girls spent their leisure outside for 1—1.5 hour a day and only 13.0 girls and no boys were outside more than 2 hours a day. 70.3 boys and 52.0 girls played active games outside,

Most of children watched TV (75.1 boys and 78.0 girls), listened to music(60.7 boys and 52.0 girls)and played computers games(50.7 boys and 25.0 girls)

Primary school children spend more time outside in summer time: riding the bicycle, roller skating. The ball and bicycle are the most popular sport equipment that pupils have at home.

Parents give priority to mental (67.5) and moral (22.5) education. Only 5.0 parents give priority to physical education. 54.3 primary school children attend active leisure classes at school (various sports and dance) and 42.4 — other leisure classes (drawing, singing, theatre).

The research shows that leisure physical activity is poor among primary school children. They mostly spend their time in setendary activities after lessons.

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## 5—7 YEAR OLD CHILDREN'S BALANCE CHANGES STIMULATING THEIR PHYSICAL MATURING FOR SCHOOL

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Well developed physical qualities create favourable conditions for children to learn more new movements and to use them in various activities.

**Research aim** — to examine 5—7 year old children's changes of static and dynamic balance and development peculiarities stimulating their physical maturing for school.

The following **research methods** were applied: educational experiment, testing, statistical analysis. To test children's balance Bruininks-Oseretsky tests of motor proficiency were chosen: three items static balance (standing on preferred leg on floor (walking line), standing on preferred leg on balance beam, standing on preferred leg on balance beam, eyes closed) and five items dynamic balance (walking forward on walking line, walking forward on balance beam, walking forward heel-to-toe on walking line, walking forward heel-to-toe on balance beam, stepping over response speed stick on balance beam).

**Research organization.** The educational experiment lasted for two years. 120 children participated in the experiment. The experimental group consisted of 62, the control group — 58 children from Klaipėda kindergartens. The children from the experimental group were educated according our created program for 5—7 year old children's maturing for school, one motor education part of which was teaching balance. The control group used the program "Verinelis", certified by Lithuanian Republic Ministry of Education. Three control researches of balance abilities were conducted.

**Discussion of the results.** Our research show that balance abilities depend on children's age. Five year old children did not manage to keep balance even for a second standing on preferred leg on balance beam, eyes closed, often did not manage to perform dynamic balance tasks in reduced support area for longer period of time, to regain balance after beginning to lose it, could not comprehend special and movement parameters, did not manage to maintain attention. It corresponds with the results of B. J. Craty and M. Martin research. Balance abilities, vestibular apparatus, sensory and motor integration improve rapidly during sixth and seventh years of life. Children of this age perform dynamic and static balance tasks more easily. Girls' balance is better than boys'. This fact of our research corresponds with S. D. Frederick (1977) and G. S. Morris's research data. After results analyses significant individual differences were found. Summarizing the results of the pedagogical experiment it can be stated that qualitative and quantitative children's balance indexes improve if balance developing tasks and games are performed expediently and purposefully. 5—7 year old children's balance abilities transform in the educational process reaching a higher level, which is expressed by more rational, precise and quicker actions, as well as by the quality of tasks performance. Having performed statistical analyses and compared the results of control and experimental groups it can be stated that our created educational programme for balance abilities applied in the experimental group was more effective than in the control group.

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## PUPILS' OF SENIOR FORMS BUSINESS AND RECREATION IN THEIR LEISURE TIME

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Recreational needs orient individual's behaviour which is related with physical development, rest, entertainment, sport or tourism; also, it predetermines the understanding of beauty of an individual's body, harmony between physical and spiritual parameters (Barkauskaitė, 1998; Vitkienė, 2002). Individual's interaction with physical education, wellness, rest and traditions, according to M. Blaxter (1993), evoke understanding of culture, values. Theoretical analysis of these factors allows us to deeper acknowledge the model of expression of recreation as well as its influence on individual's quality of life, self-expression. That is why the research was oriented towards the factors which influence the expression of recreation in youth's leisure time.

**Aim** of the research was to theoretically reason the consistency of the conception of busyness and recreation in educational environment, and to investigate the expression of leisure activities of pupils of 10—12 forms empirically.

**Methods and organisation** of the research.

The research was carried out at comprehensive schools of Šiauliai town in 2005, pupils of 10—12 forms ( $n = 653$ ) took part in it. In order to implement the aim of the research, we have applied a descriptive analysis and a survey.

**Consideration of the results**

The analysis of the research results allows us to state that boys are more often (once per day, several times per week) engaged in sport activities, while girls are more passive. The relation between pupils' gender and choice of sport activities was set ( $p < 0.004$ ). Twice more boys take exercises everyday in comparing with girls.

The specificity of gender was noticed in choice of forms of sport activities as well: 41.2% of boys who took part in the research said that they were exercising various sport games (basketball, football and etc.) as well as fishing (15.4%) several times per week. The boys only once per month in winter exercise the following kinds of physical activities: skiing (45.8%), skating (27.9%), and only several times per year they take part in tourist hikes (62.9%).

Like the boys, more than half of girls (56.9%) said that they went to school on foot, and only one tenth of them took exercises every morning. 18.9% of the girls who participated in the research jog several times per week, 21.6% of them ride a bike several times per week. A little bit more rarely — only once per week — girls play sport games; they ski and skate averagely only once per month (38.2%) or even once per winter season (56.5%). As the girls investigated have stated, 45.7% of them did not take exercises at all, also, majority of them did not fish (68.5%) and did not participate in tourist hikes at all (21.1%).

Strengthening of health was indicated as one of the most important motives by both boys (50.0%) and girls (61.7%); 64.7% of girls also indicated the motif of wishing to look prettier; also, this motif encourages almost half of boys (48%) to go in for sports. 43.3% of boys and 50.4% of girls go in for sports wishing to spend their leisure time well. Boys more often (30.9%) than girls (16.2%) stated that a desire to win a competition also was an important motif encouraging going in for sports.

To sum up the results of the research we may state that there are no effective strategies directed straight towards a person, his/her everyday behaviour. To our mind, it is purposeful to find out and exalt values which would educate a physically active lifestyle, would change a point of view towards recreation and possibilities for its implementation.

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# THE INFLUENCE OF STRENGTH ON THE RUNNING SPEED DYNAMICS OF THE BEST LITHUANIAN SPRINTERS IN THE 60 METERS RUN

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The aim of the research is to determine the influence of strength on the running speed rate of the best Lithuanian sprinters.

**Research methods and organization.** 1. To determine running time duration in 60 m run (recording the time after every 10 m); 2. To determine leg muscle strength; 3. To calculate mathematical statistics (arithmetic average, standard deviation, the significance of variability differences in average according to the Student criteria).

The subjects of the study are 11 Lithuanian short distance runners (height =  $179.82 \pm 5.53$  m, weight =  $76.91 \pm 4.35$  kg, maximum power =  $150.91 \pm 32.39$  kg), classified according to the relative muscle strength into two groups (the first group:  $n = 6 - 2.25 \pm 0.20$  per 1 kg body mass; the second group:  $n = 5 - 1.70 \pm 0.16$  per 1 kg body mass).

**Discussion of the research findings.** The research results show that athletes from the first group (larger maximum power  $174.17 \pm 21.08$  kg and relative power  $2.25 \pm 0.20$  per 1 kg body mass) run faster the first 30 m than athletes from the second group (maximum power  $123.00 \pm 16.81$  kg and relative power  $1.70 \pm 0.16$  per 1 kg body mass) ( $p < 0.05$ ), but lose to the athletes from the second group in the segment 50–60 m ( $p < 0.05$ ) (Figure 1).

The sprinters from the second group, showing lower strength results, are able to reach a higher increase in speed than those from the first group (the first group: 2.84 m/sec, the second group: 3.26 m/sec). The data obtained from the research confirms the statements of the authors that the ability to run fast after the start signal does not have any correlation link with the maximum speed results. Strength is conversely proportional to speed; therefore, theoretically the higher the running speed is the less strength can be used during a short take-off period. Training means aimed to perfect the start acceleration are specific and by their contents as well as biomechanical and physiological characteristics can substantially differ from those training means which are intended to develop the maximum running speed (Radžiukynas, 1997; Stanislovaitis et al., 2003).

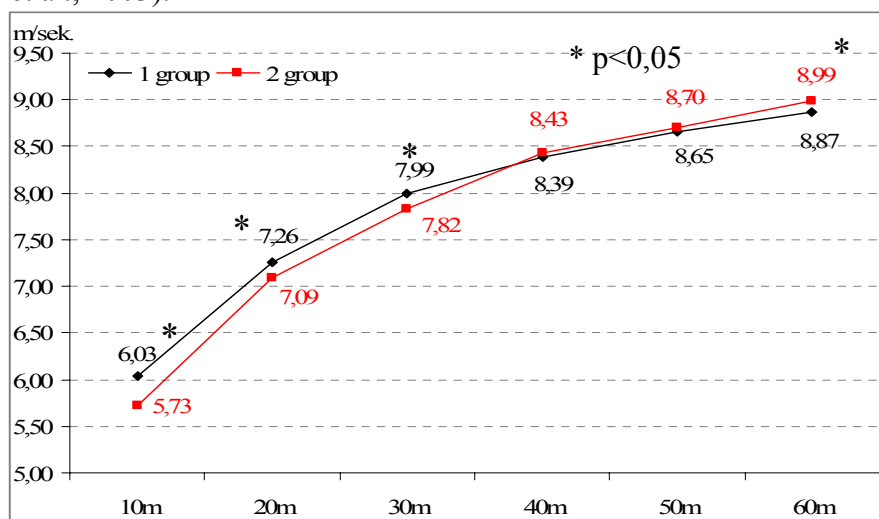


Figure 1. The running speed dynamics of different groups in 60 m

**Conclusion.** In conclusion, it can be stated that the application of strength exercises in training sprinters has to be highly individual and specific.

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# THE VARIABILITY IN CHAOTIC SYSTEMS DURING ISOKINETIC KNEE FLEXION AND EXTENSION AT 450 °/s RANGE MOTION TESTING

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**The aim of the study** — to determine the variability of chaotic systems during isokinetic knee flexion and extension at 450 °/s range motion testing.

**Methods of the study.** The participants of the study were 10 healthy male, age: 19—23 years; height —  $177.8 \pm 5.8$ ; weight —  $78.2 \pm 6.1$ . The study was performed in the human motoric laboratory of Lithuanian Academy of Physical Education in year 2005/2006. All the subjects have done non-stop 50 repetitions of knee flexion and extension at 450 °/s range motion on “Biodex System Pro 3” device.

**Mathematical statistics.** To determinate variability of chaos system we have used “chaos data analyzer” software version 2.1 (1998). There were estimated following parametres: Lyapunov exponent, correlation dimension, Kolmogorov-sinai entropy, standard deviation. We have selected the two subjects whom the data have shown the highest and lowest values of chaos.

## Results and discussion

The algorithms which are balanced for chaos or nonlinear systems determination show the processes quality of dynamic systems. From the study we have determinate that the subject “A” had lesser variables which indicate chaos than subject “B”. The value of Lyapunov exponent are following: subject “A” — 0.165, subject “B” — 0.225; Kolmogorov-sinai entropy: 0.637 and 0.771; Correlation dimension: 3.409 and 3.582; standard deviation: 49.44 and 53.28. Attractor which is presented (Fig. 1) shows more stabile curve of dynamic motion at subject “A” than at subject “B” curve. We suppose that the variation of torque reflects the stability level of central nervous system, muscles coordination and etc.

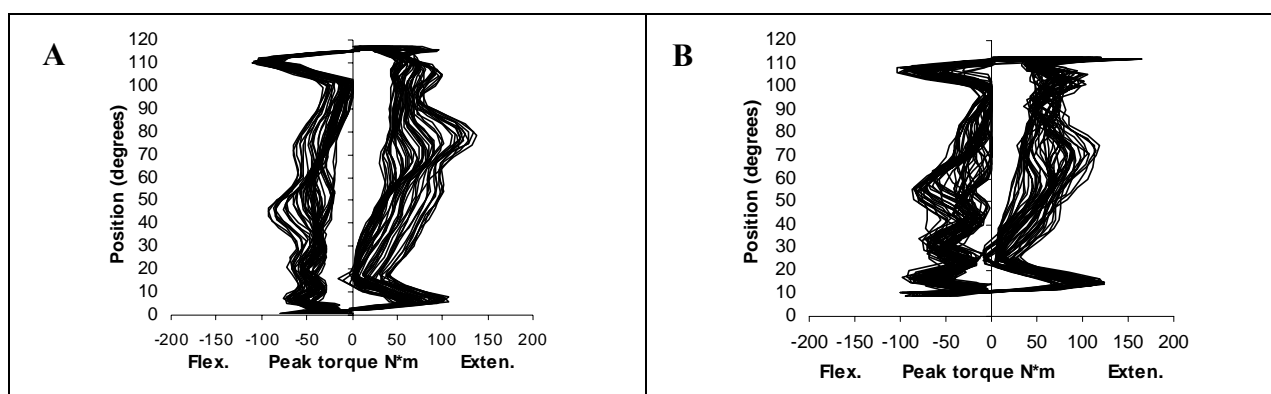


Fig. 1. Attractor view of knee flexion and extension motion at speed 450 °/s of subject “A” (lowest chaos variables) and subject “B” (highest chaos variables) witch illustrating the position and peak torque interaction

**The main conclusion.** We have proved the fact that always in the control group there are differences in stability of variation of dynamic system. The results from the study have showed that the subject “A” during 50 nonstop repetitions had more stabile dynamic of knee flexion and extension motion, than subject “B”.

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# YOUNG PEOPLE'S LIFESTYLES AND SEDENTARINESS — A EUROPEAN PERSPECTIVE

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## **Abstract**

Studies into pre-school and school children in European countries reveal an alarming increase in the proportion of overweight children: varying from country to country ten to twenty-five per cent are already overweight by the time they start school. This trend is most disquieting. The children in question are in great danger of suffering from obesity and its consequences for the rest of their lives. This can lead to physical deficits as well as psychosocial problems and restrictions in their performance capacity as a whole.

The rise in the prevalence of overweight people is largely caused by social developments of the past decades. These have led to changes in lifestyle, above all to an increase of sedentary behaviour with major implications for the energy balance.

The greater part of the lecture will deal with these changes in lifestyles and its causes focusing on nutrition, media consumption and physical activity in young people in European countries. In addition emphasis is put on the question how to help children, adolescents and families to develop an active and healthy lifestyle and so prevent them from becoming overweight. Reference is made to a macrosocial approach, covering many aspects of life of children and young people and focusing on prevention.

# ATHLETES ATTITUDE TOWARDS COMMUNICATION BETWEEN TRAINER AND ATHLETES (IN VIEW OF BASKETBALL PLAYERS AND WRESTLERS AGED 15 TO 18)

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Generally, research studies are focused on peculiarities of communication between athlete and trainer and within male or female sport teams without comparing the similarities and differences of athlete in the two gender groups (Eys et al., 2003; Malinauskas, 2005). The article focuses on revealing specific features of communication of trainer with basketball players and wrestlers aged 15 to 18 (evaluation by athletes). By seeking to achieve the set goal, the following tasks were solved: to investigate how basketball players and wrestlers estimate their trainer's professional and non-professional communication and behaviour (gnostic, emotional and behavioural components), and to establish the efficiency of trainer's communication during training. It is presumed that athletes of team sports (basketball players) more favourably estimate the trainer's communication with them than the athletes of individual sport branches (wrestlers).

During the research the following methods were applied: questionnaire-based analysis (questionnaire *Athlete and Trainer* and *Efficiency of Communication during Training*), and mathematical statistics ( $\chi^2$  test). The method *Athlete and Trainer* (Meidus, 2004) defines positive and negative athlete's attitude to communication with trainer. The following three components of communication between athletes and trainer were evaluated: gnostic (informative), emotional and interactive (behavioural). The T. Dembo and S. Rubinstein method (Елисеев, 1994) *Estimation on the Efficiency of Communication during Training* is constructed to evaluate four rates: trainer's attentiveness, trainer's criticism, trainer's praise, and trainer's support.

The research was carried out in 2004 with 86 basketball players and wrestlers aged 15 to 18.

When applying the J. Hanin method *Athlete and Trainer*, it was established that basketball players estimate favourably their trainer's behaviour and communication, and wrestlers — only averagely. When applying the  $\chi^2$  test, it was disclosed that basketball players statistically significantly had more favourable estimation of their interaction with trainer and the level of trainer's emotional components ( $p < 0.05$ ). When employing the T. Dembo and S. Rubinstein method *Estimation on the Efficiency of Communication during Training*, it was revealed that basketball players evaluated trainer's criticism as milder, and had statistically significantly ( $p < 0.05$ ) more favourable estimation of trainer's support during training.

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## RBE APPLYING VELOERGOMETRIC LOAD

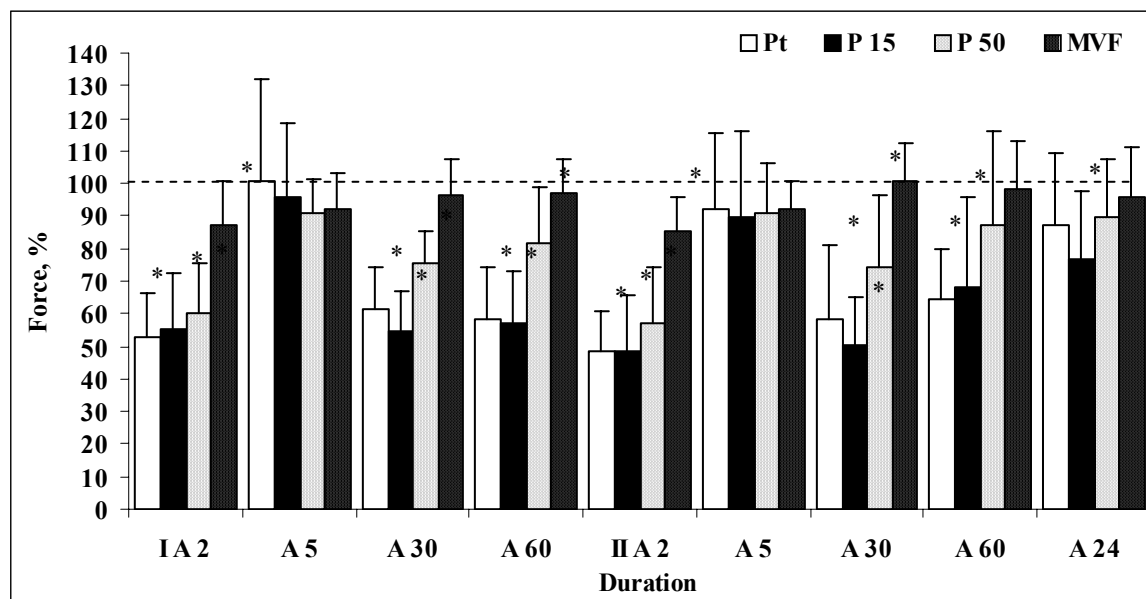
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**Introduction.** It has been found that morphologic cell changes are caused by a sudden muscle stretching and this damage is extremely strong doing eccentric and eccentric-concentric exercises (Sayers Clarkson, 2001; Nosaka et al., 2002 b). Increase of metabolite concentration in blood may influence the damage indirectly. During metabolic fatigue calcium suction (pump) capacity decreases and  $Ca^{2+}$  does not manage to return to the sarcoplasmic net (Fitts, 1994). When  $Ca^{2+}$  increases in the myoplasma ferments are activated. They induce the protein degradation on which electromechanic links depend (Chin et al. 1997; Smith et al., 1999) In this case the links between T-system and sarcoplasmic net may be disturbed for a longer time than the extinction of metabolites; at the same time during the recovery LFF increases.

**Aim of the research** is to establish the influence of two-day long loads on velorgometer on muscle fatigue and its recovery.

**Methods.** The subjects of the research were healthy males who did not actively participate in sports activities (n=10). Before the research muscle force caused by electrostimulation at 1.15 and 50 Hz frequency when the knee was bent at 90 and 135 angle, MVF, muscle soreness and La concentration in blood was assessed. The applied load was 2 series on velorgometer for 30 s every 1 min. Similar testing was done 48 hours after the load.

### Results



Note. Percentage changes in the indices of Pt, P 15, P 50 and MVF (compared to initial values) 2 (A 2), 5 (A 5), 30 (A 30) and 60 (A 60) min after load I and 2 (A 2), 5 (A 5), 30 (A 30), 60 (A 60) min and 24 (A 24) h after load II. \* — p < 0.05, compared to the initial value.

Fig. 1. Changes in muscle force evoked by electrostimulation of *m. quadriceps femoris* at 1 Hz (Pt), 15 Hz (P 15) and 50 Hz (P 50) frequencies and changes in MVF before and after loads I and II. Muscle force was recorded at the angle of 135° in the knee joint ( $\bar{x} \pm S$ )

Maximum voluntary force and *quadriceps femoris* muscle force caused by electrostimulation decreased after 30 s duration of two series load at maximum intensity on velorgometer. LFF increased step by step, 30 min after the load. MVF recovered 5 min after the load. Force caused by electrostimulation recovery lasted longer than 1 hour and it depended on the muscle length. Repeating the same load after 60 min (the muscle was fatigued) involuntary muscle contraction force decreased as much as after the first load. Research results showed that

after concentric exercises RBE manifested itself. Because of concentric loads at maximum intensity metabolic fatigue appears: muscle contraction force decreases because of energetic substances(ATP, KP and glycogen decrease) as well as metabolite (inorganic phosphate, hydrogen ions, etc) concentration increases (Child et al., 1998; MacIntyre et al., 2001; Martin et al., 2004).

**Conclusions.** Repeated bout effect reveals itself 48 hours after the load on velorgometer. Applying the repeated load on velorgometer after 48 hours expression of indirect muscle mechanic damage indicators decreases; muscle soreness decreases and muscle contraction function recovery increases. This shows that effect of repeated load reveals itself not necessarily only after eccentric — concentric loads: it also manifests itself after concentric loads.

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# THE RESULTS' ANALYSIS OF WORLD ELITE SHOOTERS IN THE WORLD AND OLYMPIC GAMES

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## Introduction

The main competition of the season is one of the most important means of improvement of sportsman's preparation and mastery. The indicators of competition activities are the most significant data characterizing sportsmen's preparedness (Raslanas, Skernevičius, 1998). Another aim of seasonal competition is to solve various tasks of techniques and tactics, and to accumulate competition experience.

The peculiarities of shifts in shooting results of elite shooters have been little researched (Viitasalo et al., 2001). The present study deals with the changes in results in separate events by the best shooters evaluating the world championships and the Olympic Games.

**Research aim** was to analyze the results of elite shooters in world championships and the Olympic Games.

**Research methods:** analysis of literature, analysis of competition records, mathematical statistics.

**Organization of research.** The researchers analyzed the results of men and women's pistol shooting at the world championships and the Olympic Games of 1996—2004. The shifts in results were established in the following events: women pistol shooting from the distance of 10 and 25 meters, men pistol shooting from 10 and 50 meters, and men rapid fire from the distance of 25 meters. The shooting results in qualifying and final competitions of shooters who took different places were compared.

**Research results.** It was established that the conciseness of women pistol shooting results from the distance of 10 and 25 meters at the world championships was greater than in the Olympic Games. In 1996 and 2004 the difference in sports results from the distance of 10 meters between the finalists and those who took the 41—50<sup>th</sup> places was 8.97—17.38 per cent, and in the world championships it was only 2.40—2.83 per cent. It was noticed that in the last years (2002—2004) the women shooters, who were medal winners in the most important competitions, did not show their best results in the qualifying competitions, and their final result was determined by the final shooting series. The best women pistol shooting results were produced in the Olympic Games of 1996 from the distance of 10 meters, and in 2000 from the distance of 25 meters.

The best men shooting results from the distance of 10 meters were produced in the Olympic Games of 2004, from the distance of 50 meters — in the world championship of 1988, and in 25 meters rapid fire — in the Olympic Games of 1996. Men winners of the world championships and the Olympic Games not always produced their best results in the qualifying competitions, and their final results were determined by the final series. For other sportsmen the victory was determined by the successful shooting series in the qualifying competitions, although in the final competition they were not so successful. It was established that shooters who produced their best results in both qualifying and final competitions were rather few.

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# SKILL TO ACHIEVE BIG MOVEMENT AMPLITUDE AS THE CRITERIA DIFFERENTIATING PUPILS THAT BEGIN TRAINING IN TEAM SPORTS

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## Introduction

The aim of this work was to investigate the level of flexibility among boys at the age of 10 representing different sports disciplines, namely team sports. The research material consisted of pupils of sports classes in Szczecin. Investigations had been conducted on the grounds of the following test: forward bend depth in a sitting posture. Additionally structural parameters had also been investigated to eliminate the effect of limbs length on the measurement value.

## Material and research methods

Investigated group consisted of pupils at the age of 10 that begin training process in different sports disciplines (boys attending sports classes; n = 97). Control group consisted of 10-year old boys attending ordinary primary schools in Szczecin (n = 39).

Measurements were preceded by standard warm-up lasting for 7 minutes (Borms and Van Roy, 1996). Of course, the most desired tests are those that allow for special suppleness measurement, namely mobility of joints of the primary importance in particular sports disciplines. But it would cause difficulties in comparing and interpreting obtained results. Therefore, taking into consideration the aim of research, the author went for a depth of forward bend in a sitting position test measured with the use of a special scale (Szopa and co-authors, 1996). Additionally, anthropometric measurements were taken (lower limb length, torso length, upper limb length), necessary for further analysis of tests results, allowing to eliminate an effect of limbs length on suppleness level, according to methodology applied by Zak and Sakowicz (1996).

## Tests results

All investigated subgroups (pupils of a comparative group and pupils practicing different team sports) were characterized by very high variability inside a group. The worst results were obtained by pupils in the comparative group, whereas the best ones — by pupils practicing handball. There are three subgroups that haven't reached 50 cm during the test: the control group, basketball group and volleyball group. Differences between average values obtained during suppleness measurements and its level after eliminating an effect of lower and upper limbs length on test results were analyzed with paying special attention to their statistical significance.

Statistically significant differences occurred between basketball group and handball group, between comparative group and handball and football groups.

After eliminating an effect of limbs length on results of suppleness measurement statistically significant differences occurred between comparative group and volleyball group. The largest percentage of pupils with the result of less than 50 cm in suppleness test appeared in the comparative group. The largest percentage of pupils with the result of more than 50 cm in suppleness test appeared in the football group.

## Discussion and conclusions

Results obtained in „forward bend test” are not significantly different from results obtained in an all-Poland population research (Pilicz and co-authors, 1993). Differences between results in „forward bend test” and the earlier tests among children in Szczecin came out to be also relatively small (Umiastowska, 2002).

As it turned out, attempts to compare differences between the level of suppleness in particular groups were the most difficult part. While results of suppleness measurement allowing to differentiate pupils selected for sports training from the rest of the population coincide with results obtained by Szopa (1987), specialist literature doesn't offer comprehensive comparison between the suppleness level of pupils selected for particular sports disciplines.

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## **ERASMUS MUNDUS, THENAPA II AND JOINT ACTION: EUROPEAN COOPERATION PROJECTS TO ENHANCE FUTURE RESEARCH AND EDUCATION IN ADAPTED PHYSICAL ACTIVITY**

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With the support of the European Commission the Catholic University of Leuven, Faculty of Kinesiology and Rehabilitation Sciences is coordinating three international projects. The basic philosophy of each of them is the promotion of physical activity as an excellent mean to improve social inclusion and life long well-being and to eradicate discrimination of people with disabilities in their personal and professional life.

Under the call of Erasmus Mundus Master Programmes the joint Master in Adapted Physical Activity (APA) was selected in January 2005, for a period of 5 years.

The Erasmus Mundus Master in Adapted Physical Activity is a postgraduate university programme that addresses state-of-the-art research and teaching methodology in Adapted Physical activity (APA), as well as the social, pedagogical, and technical aspects of physical activity adapted to the needs of disabled persons.

For the first year, 39 students from 25 different countries (10 European and 15 non-European) were selected.

The unique aspect of this Master course is the intercontinental character. Under action 3 of the Erasmus Mundus framework, this international aspect was even extended by establishing partnerships with 3 non-EU universities: Queensland University (Australia), the University of Stellenbosch (South Africa) and the University of Virginia (USA). These partnerships promote an extended mobility of students and scholars".

In the past 50 years, one of the most important changes within Europe has been the rapid increase in the number of people living into their 70s, 80s and beyond. Most of those people have some physical or mental disability, regardless the fact if they acquired this disability at birth, later in life or through the normal process of ageing.

To meet the new demands of this population and their specific needs in the area of exercise and sport the Thematic Network THENAPA II "Ageing and disability — a new crossing between physical activity, social inclusion and life-long well-being" was started in 2004.

The main aim of the network is to collect on European level, the information concerning physical activity and sport for older adults and to identify and develop the relevant educational programmes in the students' curricula.

The third project "Sports and Physical Activity for Persons with Disabilities — Awareness, Understanding, Action" focuses on children and youngsters with disabilities. This group is often excluded from participation in regular physical education classes and sports programmes. The aim of the project is to endorse full inclusion and participation of children and youngsters with a disability in all aspects of society through physical activity and sports, to encourage equity and to promote communities in which no one is segregated and everyone belongs.

The three projects give an outstanding opportunity to have a dynamic exchange of knowledge, experience and ideas between the universities all around Europe. That will make a substantial contribution to the establishment of an intercontinental cooperation in teaching and research in APA as well as in general improvement of the quality of live of the persons with a disability.

# THE IMPLEMENTATION OF THE SPORT EDUCATION MODEL IN HONG KONG

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Sport education is one of the pedagogical models that has attracted attention and interest from physical educators and researchers recently. This model evolves from play education and aims at the promotion of positive sport experience for students (Siedentop, 1994). There have been a growing numbers of sport education research findings being published lately. Much of these research findings give similar results (Siedentop, 2002). Summary of these findings are: a) some learners prefer sport education experiences to their previous PE experiences; b) students enjoy the socializing benefits of sport education that accompany team membership and affiliation; c) students of different skill levels learn better and perceive the model positively; and d) teachers are supportive of the model. However, the implementation of sport education in some contexts has not been without difficulties (Brunton, 2003; Hastie, 1998). It seems that we still have much to understand why sport education do not work in some settings and what might be difficulties which appear during implementation.

Sport education model is new to Hong Kong physical education teachers. Since the model is well received in most western countries, it seems that this model should be promoted locally. Therefore, one of the purposes of this study was to examine the difficulties the teachers may face when implementing the sport education model. Besides, the investigators were also interested to know the views of teachers and students on this model after their implementation and experiences. To achieve these objectives, a qualitative approach and multi-methods were employed. Teacher reflective journal, semi-structured teacher interviews, student questionnaire and lesson observation field notes were utilized as the research tools in the study. The participants for this study were two secondary school physical education teachers and 110 secondary school students in their schools. The teachers were asked to teach a unit of football lessons in the sport education model approach to two classes of students. They were also requested to keep a reflective journal that focused on their perceptions about the process of implementation the sport education approach as well as the reaction of the students to this teaching model. A post-teaching interview was conducted with each teacher individually. Questions focus on their views of using the sport education approach was developed to use as a guide during the interview. The interviews were audio-taped and later transcribed verbatim for analysis. Views of students toward the effectiveness of the instructional approach were also obtained through the use of a structured questionnaire at the end of the teaching unit. The field notes were taken during the lesson observations by the first investigator. Data were organized and analyzed through inductive analysis and constant comparison. Categories that arise frequently were combined to form themes.

Results revealed that the major difficulty faced by the teachers was the planning before the implementation of the model. Both teachers claimed that they had no local references to follow when planning. They also maintained that they had problems in planning how to motivate and help students to perform their assigned roles in the lessons. However, the teachers held positive views on the model as most students learnt actively and well in the lessons. Most students expressed that they understood more about the football games and the organizing of the competition. They also valued the learning of collaboration skills and team spirits in the lessons. The findings hold implications for the physical education practitioners and teacher educators in Hong Kong.

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## CHARACTERISTICS OF ELITE SKIERS' COMPETITION ACTIVITY

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Appropriately and individually planned competition ensures consistent improvement in athlete's physical efficiency, good sportive form before the main competition. During Olympic years structure of competition activity and optimal number of starts have to be planned with regard to athletes' organism's potential to adapt competition loads and duration of recovery after competition activity loads (Шустин, 2003; Головачев, 2003).

Now the program of skiing competition is diverse: skiing competition in classical style ways, competition with separate start, competition with massive start, combined competition "Pursult" (half of the distance is skied in classical ways and another half of the distance is skied using skiing steps), individual and team sprint competition. Each way of skiing has specific requirements for adaptation of skier to competition activity (Раменская, 2000).

Problem of specialization of the world elite skiers in different skiing styles and particular competition programs is not analyzed much. Scientific literature lacks information about the amount of elite skiers' competition activity and its structure during preparation for the main start of the season.

**Goal of the analysis** — to survey the amount and structural components of the world elite skiers' competition activity during Olympic year's cycle.

**Subject of the analysis** — peculiarities of the competition activity of skiers' racers, who took 1—10 places in individual competition of Turin Olympic Winter Games.

**Methods.** Analysis methods that have been used: study of literary sources, comparative analysis, metaanalysis, and mathematical statistics. Analysis of competition activity during 2005/2006 season of skiers, who took 1—10 places in individual competition of Turin Olympic Winter Games, has been carried out.

**Results.** Skiers, who took 1—10 places in 30 km combined competition (Pursulte) 8—11 times took part in the World Skiing Cup and FIS category competitions before Olympic Games. Skiers 5—6 times took part in 15 km competitions, 1—2 times in 30 km competition and 1—2 times took part in Pursulte competition. Six skiers, who took places in the first decade in 30 km competition, were in the first decade of the strongest skiers in 50 km competition in free style skiing as well.

Skiers, who took 1—10 places in 15 km competition in classic style, took part in different skiing distance competitions 8—13 times before Olympic Games. These skiers also 2—6 times took part in skiing sprint competition. Skiers, who took 1—10 places in individual skiing sprint competition 4—7 times took part in skiing sprint competitions before Olympic starts. Skiers of this group (with exception of T. A. Hetland (Nor) did not take part in other individual games of Olympic skiing program.

**Conclusion.** Elite skiers can be divided into two groups according to the specifics of their competition activity: skiers of medium-long distances and skiers sprinters. There can be divided three groups of skiers according to elite skiers' strategy of preparation for the main starts and competition activity scoring: skiers of classic style, universal skiers, and skiers of sliding style.

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## SMOKE AND ALCOHOL ADDICTION AMONG PHYSICAL EDUCATION TEACHERS

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According to the data from Lithuanian adult's healthy living observation project (*FINBALT HEALTH MONITOR*) spread of smoking among Lithuanian women had increased since 1994 yr. And spread of smoking among Lithuanian men had increased till 2000 yr. while decreased later. The occurrence of strong alcoholic drinks usage among men hadn't changed. Women started using alcoholic drinks more often. The consumption of beer increased as well. Alcohol and narcotic usage spread among adults as well as among schoolchildren. 15—16 years old Lithuanian schoolchildren research (ESPAD 99) data showed that smoking spread in country same as using of alcohol. The personal pedagogue's characteristics and his lifestyle have a very large educational impact on schoolchildren health education.

**The aim of this study.** To define spread of smoking and using alcohol among physical education (PE) teachers.

**Material and methods.** This investigation was performed during the 2005—2006 school years. The investigation involved 320 PE teachers (184 men and 136 women) who have been selected randomly from all Lithuanian secondary schools. The average age of all participants is  $42.5 \pm 21.5$  years.

In this study we used anonymous questionnaire method. There was applied Lithuanian population lifestyle and practical nutrition questionnaire from National nutrition center and World Health organisation survey, which was accomplished in 1997 year (Kadziauskienė ir kt., 1999).

The SPSS for WINDOWS analytical software was employed for the analysis of the research results and we calculated these statistical parameters: arithmetical mean ( $V$ ), significance of mean value criterion ( $p$ ), where results were statistically significant, when  $p < 0.05$ .

**Results.** Considering the research data men (29%) smoke more compare to women (15%). Middle-aged 36—50 years old (25%) and elder 51—64 years (23%) smoke more than junior 21—35 years old teachers (14%) ( $p < 0.05$ ). Only 10% of men and 30% of women were not using alcohol at all. And the difference between results is statistically significant ( $p < 0.05$ ). Strong alcoholic drinks mostly use middle-aged 36—50 years old teachers. But only 9% of men and 7% of women don't use beer at all. Significantly ( $p < 0.05$ ) lower consumption of beer indicated in younger 21—35 years old PE teachers. Significantly ( $p < 0.05$ ) more PE men (28%) teachers than women PE teachers (15%) weren't using wine at all. Junior and middle-aged PE teachers are fond of wine more than and elder PE teachers.

Summarizing this study data the following conclusions have been formulated:

1. Smoking habits spread among PE teachers: significantly ( $p < 0.05$ ) more men (29%) smoke compare to women (15%).

2. There are pretty large consumption of alcoholic drinks: Only 10% of men and 30% of women were not using alcohol at all. PE men teachers more than women PE teachers use strong alcoholic drinks and beer, though women drink more wine. Junior (21—35 years old) PE teachers use more wine, middle-aged (36—50 years old) PE teachers use more strong alcoholic drinks, and elder (51—64 years) PE teachers use more beer.

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