

# **YOUTH SPORT**

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The conference is hosted by the University of Ljubljana, Faculty of Sport, Slovenia

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# SCIENTIFIC PROGRAMME

## KEYNOTE SPEECHES

**Friday, 7 December 10:30 - 11:30**

NEOLIBERALISM, YOUTH SPORTS, AND THE "GOOD PARENT"

*Prof. Dr. Jay Coakley, University of Colorado, Colorado Springs, USA*

**Saturday, 8 December 9:00 - 10:00**

DOES SOCCER'S (AND TEAM SPORTS) YOUTH COMPETITIONS SYSTEM MEET THE DEVELOPMENTAL  
NEEDS OF YOUNG ATHLETES?

*Prof. Dr. Antonio Tessitore, University of Rome "Foro Italico", Italy*

**Saturday, 8 December 14:30 - 15:30**

DUAL CAREER IN FINLAND – NATIONAL OVERVIEW – REGIONAL

*Risto Keskitalo, Oulu Region Academy of Sports, Finland*

## PARALLEL SESSIONS

<b>Sessions 1</b>	<b>Friday, 7 December</b>	<b>11:45 - 13:15</b>
<b>Medical Issues and sports programmes</b>		
<b>Sessions 2</b>	<b>Friday, 7 December</b>	<b>14:30 - 16:00</b>
<b>Youth Development</b>		
<b>Sessions 3</b>	<b>Friday, 7 December</b>	<b>16:15 - 17:15</b>
<b>Principles and perspectives for sports training in Youth Sports</b>		
<b>Sessions 4</b>	<b>Friday, 7 December</b>	<b>17:15 - 18:15</b>
<b>Psycho-sociological aspect of Youth Sport</b>		
<b>Sessions 5</b>	<b>Saturday, 8 December</b>	<b>10:15 - 11:45</b>
<b>Sports performance and its aspects</b>		
<b>Sessions 6</b>	<b>Saturday, 8 December</b>	<b>10:15 - 11:45</b>
<b>Sports policy and other field dilemmas</b>		
<b>Sessions 7</b>	<b>Saturday, 8 December</b>	<b>11:45 - 13:15</b>
<b>Challenges in the field of physical education</b>		
<b>Sessions 8</b>	<b>Saturday, 8 December</b>	<b>11:45 - 13:15</b>
<b>Training and testing 1</b>		
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<b>Sessions 12</b>	<b>Saturday, 8 December</b>	<b>16:45 - 18:00</b>
<b>Training and testing 2</b>		

## SCHEDULE OF PARALLEL SESSIONS

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Friday, 7 December 11:45 - 13:15

Medical Issues and sports programmes

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Bruch, V., Kiško, A.	CONVENTIONAL ECHO MODALITIES FOR PRE-PARTICIPATION CARDIOVASCULAR SCREENING IN SPORTS – A NAIVE MYTH OR THE CHALLENGE OF THE DAY?
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Session 2

Friday, 7 December

14:30 - 16:00

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Triska, C., Hable, W., Tschan, H.	CLIMB HIGH – HEALTH PROMOTION AND CLIMBING IN CHILDREN
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Žnidarec Čučković, A., Hećimović, M., Kanjugović, I., Ohnjec, K.	A COMPREHENSIVE DEVELOPMENT PROGRAM BASED ON PHYSICAL EDUCATION AND SPORT ACTIVITIES FOR YOUTH IN LEISURE TIME AND INFORMAL ENVIRONMENT

Session 3

Friday, 7 December

16:15 - 17:15

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Cecić Erpič, S.	EMPLOYMENT AND EMPLOYABILITY OF SLOVENIAN ELITE ATHLETES: BE A WINNER IN ELITE SPORT AND EMPLOYMENT BEFORE AND AFTER ATHLETIC RETIREMENT
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Saturday, 8 December

15:45 - 16:45

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## Challenges in the field of physical education

Chairman: Majerič, M.

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# KEYNOTE SPEECHES

## **NEOLIBERALISM, YOUTH SPORTS, AND THE “GOOD PARENT”**

**Coakley, J.**

University of Colorado, Colorado Springs, USA

As current political leaders embrace neoliberal ideas and policies, expectations for parents have changed so that the “good parent” is increasingly responsible for the actions and whereabouts of their children 24 hours a day, 365 days a year. At the same time, the belief that sports provide positive socialization experiences has led to the dramatic growth of organized, adult controlled youth sport programs. As public, community- and neighbourhood youth sports have been defunded, a wide range of private programs have taken their place. Choosing the program that is best for a child and making sure that their child has positive developmental experiences has become a parental responsibility. This presentation focuses on the implications of this situation and the challenges that it creates for parents, children, coaches, and youth sport administrators.

## **DOES SOCCER'S (AND TEAM SPORTS) YOUTH COMPETITIONS SYSTEM MEET THE DEVELOPMENTAL NEEDS OF YOUNG ATHLETES?**

**Tessitore, A.<sup>1</sup>, Gjaka, M.<sup>2</sup>**

<sup>1</sup>University of Rome "Foro Italico", Human and Health Sciences, Department of Movement, Rome, Italy

<sup>2</sup>University of Pristina, Faculty of Physical Education and Sport, Pristina, Republic of Kosovo

Sport can be considered one of the most practiced youth's leisure activities. Besides to shape fitness level and technical skills, through sport also social, emotional and cognitive skills can be acquired and transferred to other areas of life. Indeed, by building proper environments and relationships youth can foster positive developmental experiences and deal with successes and failures. In this sense, perceive enjoyment and competence have been reported among key factors of positive experiences and sound involvement in sport. Indeed, the perception of performing with competence and facing realistic challenges is very important to infuse feelings of pleasure and fun. Therefore, it is fundamental to provide a youth competitions system that helps them to feel competent and build long-term development and achievements, rather than stressing on their immediate success. In this regard, sport environments mainly focused on short-term results can determine negative effects even on early selected (considered "talented") athletes.

Then, we can put two questions: are the current youth competition models in line with what has been said above? Do these models push more on the direction of coaches to overlook some "future talent athletes" in favour of others just readier for the way competitions are today structured?

If we see competitions as an important activity whose goals have to be tailored on the needs of each youth developmental stage, we should agree to give to all the chance to compete based on their ability and readiness level. This fact requires to re-think "different solutions" to well-known aspects as relative age effects, the concept of "cut-off date" within a competition year, enhancing enjoyment with competition based on a learning pathway (in terms of skills, decision making, etc.) rather than only "scaled competitions from adult codes", provide competitions based on "athlete-centred" outcomes rather than awarding the mentality "winning at all costs".



## **DUAL CAREER IN FINLAND – NATIONAL OVERVIEW – REGIONAL**

### **Keskitalo, R.**

Oulu Region Academy of Sports, Finland

Education has been the most important factor in making Finland one of the most successful European country. As a 101-year-old independent nation Finland still keeps developing its educational possibilities. One of the target groups has been students with special talents in every aspect for instance music, languages, mathematics etc. Music has led the way since 1970 and sports followed in the middle of 1980's.

The first special sports schools was established in 1986. Six upper secondary schools and four vocational schools were selected by the government to start as demonstration schools. It was a starting point for the Finnish dual career system. Today there are 30 special sports schools funded by the government and municipalities. Half of those are upper secondary schools and the rest are vocational schools.

Oulu region academy of sports is the first of its kind in Finland. It has been established in 2001 and it has been a model for other sports academies in Finland. A Sports academy offers services for student athletes in all levels of education, all the way from primary schools until the end of university. NOC (Finnish Olympic committee) is an umbrella organization for Finnish sports academies.

## **ABSTRACTS IN CHRONOLOGICAL ORDER**

## EXERCISE PROGRAM FOR DIALYSIS PATIENTS

**Bogataj, Š.<sup>1</sup>, Pajek, J.<sup>2</sup>, Buturovic Ponikvar, J.<sup>2</sup>, Pajek, M.<sup>1</sup>**

<sup>1</sup> University of Ljubljana, Faculty of Sport, Ljubljana, Slovenia

<sup>2</sup> University of Ljubljana, Faculty of Medicine, Ljubljana, Slovenia

According to literature we can say that physical activity has many positive effects on different dimensions of dialysis patients. Previous studies mostly report about the effects of intradialytic cycling on a customized ergometer, which can currently be considered as the gold standard of the training type for dialysis patients. The aim of our study is to determine the effects of functional exercise and training counselling by kinesiologist in addition to the basic exercise program of cycling during dialysis on physical performance, blood tests and quality of life of dialysis patients. In our study we will include approximately 40 dialysis patients. Firstly we will give patients psychological questionnaires, do blood analysis and test their physical condition with selected motor tests. Then we will randomize patients in two groups: experimental and active control group. The experimental group will attend a guided functional exercise before the dialysis procedure and then perform a cycling session during dialysis in the first phase of the study, which will last for 8 weeks. In the second phase of the study for additional 8 weeks they will be instructed to exercise at home using the skills mastered during the first phase of the study on non-dialysis days, but continue with the program of intradialytic cycling. We will counsel, monitor and motivate them. The active control group will perform intradialytic exercise (intradialytic cycling equal to cycling program of experimental group) during dialysis procedure for 16 weeks. We will repeat the baseline tests after 8 (phase 1) and after 16 weeks (phase 2). Our primary end-point will be physical function, especially the result of 10-repetition sit-to-stand test. Our hypothesis is that the guided functional exercise under the surveillance of a kinesiologist added to intradialytic cycling program statistically significantly improves patient's physical performance as compared to the program of intradialytic cycling alone. Literature review showed us that physical activity has a positive impact on dialysis patients but a question, about which type of exercise is most appropriate, still arises. With our study we want to evaluate which exercise program is more suitable for dialysis patients and if we can teach them how to correctly perform individualized exercise program in their home environment.

**CONVENTIONAL ECHO MODALITIES FOR PRE-PARTICIPATION CARDIOVASCULAR SCREENING IN SPORTS – A NAIVE MYTH OR THE CHALLENGE OF THE DAY?**

**Bruch, V.<sup>1</sup>, Kiško, A.<sup>2</sup>**

<sup>1</sup> Faculty of Health, National University in Uzhhorod, Ukraine

<sup>2</sup> Faculty of Health Care, Pešov University in Prešov, Slovakia

Echocardiography (ECHO) as a diagnostically highly valuable non-invasive method allows to identify/exclude a broad spectrum of congenital cardiac abnormalities, otherwise undetectable, providing potentially life-saving screening in sports. Modern pocket-sized ultrasound devices and portable ultrasound systems that can be easily taken into the field are extremely advanced and powerful for more efficient pre-participation screening (PPS).

In the current pilot study performed in international cooperation, 500 healthy athletes aged 16-32 years (average age  $21 \pm 5$  years) including 446 males and 54 females (8:1) participating in sports like football, athletics, handball, cycling, basketball and gymnastics were examined.

All athletes were screened according to the European PPS protocol. Cardiovascular abnormalities were not detected in any of the athletes. Conventional ECHO exams were then performed in all athletes. Cardiovascular abnormalities were found in 14 cases (2.8%). In 7 (1.4%) it was mitral valve prolapse (hemodynamically significant in 1 case), in 3 (0.6%) it was bicuspid aortic valve (significant aortic stenosis in 1 case) and in 4 (0.8%) it was myocarditis, myocardial bridging, noncompaction of left ventricle and coronary artery fistula.

Conventional ECHO modalities are of enough potential for distinguishing athlete's heart from structural heart disease with evaluation of heart function. We believe, that at the beginning ECHO may be reserved for PPS in sports with vigorous and extremely high levels of physical intensity (cycling, triathlon, cross-country skiing, marathon, football etc.), and for individuals at high risk (uncommon or exercise-unrelated ECG changes, after respiratory infections etc.). We think it's the right time to revise the postulate that the inclusion of ECHO into the screening protocol is not cost-effective, and to initiate a professional debates on this issue. In conclusion, elaboration of "point-of-care" and cost-effective screening protocol with incorporated conventional ECHO modalities is on the agenda of the day.

**HYDRATION STATUS IN ADOLESCENT ALPINE SKIERS DURING TRAINING CAMP**

**Aerenhouts, D., Chapelle, L., Clarys, P., Zinzen E.**

Vrije Universiteit Brussel, Dept. Of Movement and Sports Sciences, Belgium

Although performing in a relative cold environment, alpine skiers should maintain euhydration for optimal health, performance and recovery during and between training sessions.

This study aimed to evaluate hydration status in adolescent alpine skiers during training camp.

Twelve athletes aged  $14.3 \pm 0.9$  years volunteered to participate. The study and the consent procedure were approved by the university's Ethical Committee of the Vrije Universiteit Brussel. Mean body weight (BW) was  $55.5 \pm 9.7$  kg and mean body height was  $165.9 \pm 6.9$  cm. Athletes resided at an altitude of 1600m and trained between 1614m and 2164m. During 8 consecutive days, urine specific gravity (USG) was measured before each morning training session using a refractometer. Changes in BW during each morning training session were assessed using a precision balance measuring up to 2g. Ad libitum fluid intake during training was recorded with a precision balance measuring up to 0.001g. ANOVA procedures were applied with an alpha of 0.05.

Mean USG before training remained stable throughout the training camp and ranged between 1.010 and  $1.028\text{g}/\text{cm}^3$  with only 17 to 50% of athletes with acceptable hydration status ( $\text{USG} < 1.020\text{g}/\text{cm}^3$ ). Mean training induced decrease in body weight remained stable throughout the training camp (range -420 to -587g) with individual losses up to 1197g (-3.5%) and was in most participants only partly countered by fluid intake ranging between 0 and 859g.

To conclude, fluid intake in adolescent alpine ski racers is suboptimal even when drinks are provided ad libitum during training. Furthermore, USG values before training indicate insufficient daily fluid intake in more than half of the athletes. Athletes' hydration status should be carefully monitored, and they should be encouraged to drink sufficiently during and after training sessions.

Vrije Universiteit Brussel

**DEVELOPMENT OF NEUROMUSCULAR PERFORMANCE DURING GROWTH AND MATURITY IN YOUNG BASKETBALL PLAYERS**

**Petridis, L., Kalabiska, I., Utczás, K., Tróznai, Zs., Pálinkás, G., Szabó, T.**

University of Physical Education, Sport Science and Diagnostic Laboratory

Natural development of physical abilities during growth and maturation follows a non-linear path, which also means that periods of accelerated adaptation in different physical attributes can offer additional improvement window, for example by applying appropriate training stimuli. The purpose of this cross-sectional study is to examine the natural development trend of neuromuscular performance in relation to the maturity status in young basketball players. 127 male basketball athletes were measured ranging from 11 to 16 years (mean age $\pm$ SD: 13.8 $\pm$ 1.6 years). Anthropometric and body composition (DXA) data were collected. Maturity status was defined by calculating the years from peak height velocity (PHV). The athletes were then grouped according to years from PHV in one year intervals. Neuromuscular performance was evaluated through a countermovement jump on a force platform (HUR labs) and by using the Reactive Strength Index modified (RSImod). RSImod was calculated by dividing the jump height (m) by the time to takeoff (s). Descriptive statistics and ANOVA for inter-group comparisons were performed in Statistica 13.0 software. Mean $\pm$ SD value for age at PHV was 13.1 $\pm$ 1.6 years. 33.1% of the subjects were below, 13.3% were around (-0.5 to +0.5 years), while 53.6% were above PHV. RSImod showed a total improvement of 22.2% from the least to the most matured subjects, however the greatest improvement was noticed about  $\pm$ 1 year around PHV, and more specifically one year after PHV (18.9%). More than one year before and after PHV RSImod didn't show any significant change. There were no differences and no consistency in changes of the time to takeoff. Improvement in neuromuscular performance in prepuberty is mostly related to adaptations in neural factors, while in late puberty is mostly associated to increase in muscle mass. Measurements of the rate of change in this age period can provide useful information about the magnitude and the direction of the improvement and can help to identify the periods of accelerated adaptation. The results suggest that a performance spurt in neuromuscular abilities occurs around PHV, but mostly around one year after PHV. Moreover it seems, that this improvement is attributed predominantly to gains in muscle mass, while neural adaptations were less pronounced.

**COMPARATIVE ANALYSIS OF BODY COMPOSITION OF SLOVENIAN HIP-HOP DANCERS BASED ON THEIR PERFORMANCE LEVEL**

**Prus, D., Zaletel, P.**

Despite the fact that hip-hop dance is known as world phenomenon, it is poorly researched on the field of sports medicine. Hip-hop dancers are neglected population of athletes with unfulfilled training plan, which leads into high rates of injuries caused by many biomechanical stressors. In the study we analysed physical characteristics among Slovenian male (N=16) and female (N=44) hip-hop dancers. The aim of the study was to compare their compositions based on succesfullnes and to determine which characteristics distinguish the best of the rest. Dancers where sort into three ranks based on their performance level. The body composition data was obtained with TANITA scale (Tanita, Innerscan body composition monitor, model BC-545), body height was measured with anthropometer and basic data about dancers where obtained through anonymous survey. The research exposed the tendency to morphologically suitable type of dancer, who could execute complexed movements, including acrobatics. The main differences were noted in subcutaneous fat, where more sucessful dancers from Rank 1 had 5-10% lower values than the other groups. More sucessfull dancers also have more muscle mass, bone mass and a higher proportion of water in the body compared to less successful dancers. Being a subculture, diversity in hip-hop movements still has bigger impact on final performance than the aesthetic of dancers.

**EFFECTS OF A SCHOOL-BASED MULTICOMPONENT-SPORT-INTERVENTION**

**Hauer, R., Klinger, K., Tschan, H.**

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Within the projects “Eddy” and “Eddy-Young” a school-based multicomponent-sport-intervention with children aged 8-14 years was conducted. The goal was to improve overall fitness and motor performance by implementing high quality sport and nutrition classes. The long-term aim was to reduce obesity and secondary diseases caused by a sedentary lifestyle in elementary- and middle-school children.

In both projects participants were split into an intervention (IG) and control group (CG). IG received two blocks of either 8 or 10 weeks of a multicomponent-intervention. The intervention consisted of sport exercises, and dietary information held by experts. Before, after and in between the intervention blocks participants performed sport-motoric-tests to assess motor performance. The significance level for all tests was set at  $p \leq 0.05$ .

Eddy-Young: All children improved in every subtest of the German-Motor-Test-Battery except for the sit-and-reach-test, where both groups performed worse ( $p=0.00$ ). The baseline values of the CG were significantly better within the 20m-sprint ( $p=0.02$ ), sit-and-reach ( $p=0.02$ ), push-up ( $p=0.01$ ), standing-long-jump ( $p=0.04$ ) and the six-minute-run ( $p=0.00$ ). Further, results showed greater improvement in push-up ( $p=0.00$ ), lateral-quick-jump ( $p=0.00$ ), and the overall Z-values ( $p=0.00$ ) in the IG.

Eddy: Difference in every subtest of the Motor-Test-Battery was found in all children. CG showed better baseline values in the 20m-sprint ( $p=0.04$ ), one-legged-stance ( $p=0.02$ ;  $p=0.01$ ) and the endurance-test ( $p=0.00$ ). IG showed better improvement in the sit-and-reach and endurance-test. In contrast CG showed better one-leg-stance improvements.

Findings suggest that a multicomponent-intervention involving exercise and nutrition classes held by experts improves the motor performance in children. According to greater improvements within elementary-school children it can be concluded that the promotion of a healthy lifestyle should be implemented as early as possible to prevent obesity and enhance physical fitness in youth.



**FREE TIME AND SPORT-RECREATIVE ACTIVITIES OF PUPILS IN URBAN AND RURAL AREAS**

**Nikovski, G.<sup>1</sup>, Klinčarov, I.<sup>1</sup>, Majerić, M.<sup>2</sup>, Rabrenović, L.<sup>3</sup>, Vuksanović, V.<sup>4</sup>**

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Contemporary, rapid and modern lifestyle nowadays is unstoppable with its necessities and demands. On the other hand the passive lifestyle has a negative influence toward current human life. The purpose of this survey is to establish some facts about children's free time from the primary school „AcoShopov ” an urban area and „St.Cyril and Methodius” primary school a rural area. It aims to find out how much free time they have, how it is used and whether they are implementing any sports activities. A research survey has been conducted in order to accomplish its purpose and were examined 182 both male and female students. The students were from both areas rural and urban. The examination pattern has been divided in two samples of 82 female students and 100 male students. A questionnaire was used for its implementation as a widespread method worldwide. It consisted 28 questions simplified and adjusted to meet the student needs. For its elaboration were used the current methods which established the basic data and information that are important to give the primary encounter. For all variables on the interval and ratios (measurement) scale, parametric methods are used (basic statistical parameters: arithmetic mean (X), standard deviation (SD), coefficient of variability (KV%), minimum score (MIN) (MAX). Nonparametric statistical methods (frequencies, percentages,  $\chi^2$  test, Kruskal-Wallis H test, Mann-Whitney U test) were applied to the variables on the ordinate and the nominal scale. From the interpretation of the tables in terms of sex and the environment in which students live and study although there are no large statistics significant differences between groups with respect to most issues, we can conclude that this research reveals new knowledge about the population that is the subject of this research.

**CLIMB HIGH – HEALTH PROMOTION AND CLIMBING IN CHILDREN**

**Triska, C.<sup>1</sup>, Hable, W.<sup>2</sup>, Tschan, H.<sup>1</sup>**

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The prevalence of chronic diseases associated with an inactive lifestyle is increasing in developed countries. Besides affecting the metabolic system of the human body, this inactive lifestyle even in younger ages also affects the musculoskeletal system. Therefore, the aim of this study was to assess whether a climbing training elicits significant changes in the body posture of young children. Totally, 76 pupils (aged between 13 and 15 years) were allocated into an intervention group (n=37) and a control group (n=39). The intervention group performed a 90-min climbing session once a week over a 10-week period in a climbing hall. However, all pupils were attending the physical education classes in their schools during the intervention period. Before and after the intervention the deflection of the line C7-S1 from the plumb-line and parameters of mobility (i.e. trunk bending, Ott-sign, Schober-sign, rotation, and reclination) were examined. A two-way ANOVA was used to assess differences between groups and time and the effect size was calculated using partial eta-squared ( $\eta^2$ ). Significant main effects were followed-up by Bonferroni post-hoc procedures. Significance was accepted at  $p \leq .05$ . A significant time effect was found for the deflection of the line C7-S1 from the plumb-line ( $F_{1,76}=6.72$ ,  $p=.01$ ,  $\eta^2=.08$ ). Significant group effects were found for trunk bending ( $F_{1,74}=13.40$ ,  $p<.01$ ,  $\eta^2=.15$ ), Ott-sign ( $F_{1,74}=4.61$ ,  $p=.04$ ,  $\eta^2=.06$ ), Schober-sign ( $F_{1,74}=3.77$ ,  $p=.05$ ,  $\eta^2=.05$ ), and rotation ( $F_{1,74}=45.16$ ,  $p<.01$ ,  $\eta^2=.04$ ), but not for reclination. Bonferroni post-hoc procedures revealed no significant differences ( $p>0.05$ ) for all measures. While some measure demonstrated significant main effects, the effect size order was trivial for all measures. This suggests that a weekly climbing training over a 10-week period does not elicit significant changes in the body posture of children aged between 13 and 15. Future studies should aim to investigate the effect of a chronic climbing training on the body posture of young children.

Session - Youth Development

**ANALYSIS OF THE DIFFERENCES IN THE LIFESTYLE OF THE STUDENTS AT THE FACULTY OF SPORT IN LJUBLJANA AND THE FACULTY OF PHYSICAL EDUCATION, SPORT AND HEALTH IN SKOPJE**

**Majerič, M.<sup>1</sup>, Žvan, M.<sup>1</sup>**

**Nikovski, G.<sup>2</sup>, Klinčarov, I.<sup>2</sup>, Vuksanovič, V.<sup>2</sup>, Aleksovska Velickovska, L.<sup>2</sup>**

<sup>1</sup>Faculty of Sport, University of Ljubljana

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The aim of the research was to study differences of the nutrition habits, physical activity, alcohol and tobacco consumption, mental health, and motives for lifestyle change among students at the Faculty of Sport in Ljubljana and the Faculty of Physical Education, Sport and Health in Skopje. The empirical research was carried on the sample of 100 students of the Faculty of Sport in Ljubljana and 115 students of the Faculty of Physical Education, Sport and Health in Skopje. Data analysis was made with SPSS, based on  $\chi^2$  test analysis. We found out some interesting findings that will be presented at the congress. The conclusions will be useful for narrower and wider professional public.

**SOCIAL-EMOTIONAL DEVELOPMENTAL LEVEL AND THE AVAILABILITY OF PLAYGROUNDS FOR YOUNG CHILDREN**

**Masnjak, M., Šalaj, S.**

Play is every child's basic right, it is crucial for all developmental domains; physical, cognitive, social and emotional. Play is a process through which children learn. Good quality play opportunities have a significant impact on child development (Moore, Goltsman & Lacofoano, 1992). In the dynamic process of children's play various factors like thinking, creative expressions of thoughts and feelings, and physical demands all interact. Children are constantly learning and developing through play. They also learn and master motor abilities that help them interact and communicate with their social environment. The purpose of this study was to investigate differences between social emotional development and availability of playgrounds for young children. In order to obtain necessary data parents (N=782) of children were asked to complete questionnaires assessing social emotional development of their children (ASQ:SE-2, Squires, Bricker & Twombly, 2015), and about availability of playgrounds in their community. Data was processed through SPSS program (SPSS, 2009). For analysis we used descriptive parameters and t-test. According to the obtained results the majority of children have a normal level of socio-emotional development (92,7%), 5,5% have a monitor level and 1,8% have a refer level. The majority of children have an available playground (89%), 1% of parents don't know and 10% don't have an available playground. Results show that the most vulnerable children age group is from 3,5 years to 4,5 years of age. Results show a high connection between availability of playgrounds and social emotional developmental level in young children. We need to emphasize the importance of physical activity in children's development and try to give children the freedom to play and be physically active. Based on our results, we recommend that an extra effort on expanding the variety of activities that are offered in the child's environment, is to be given to children from 3 to 5 years of age. Acknowledgments: This paper is a part of the research project "Motor skills of preschool children" [UIP - 2014-09-5428] funded by the Croatian Science Foundation.

### Session - Youth Development

#### **A COMPREHENSIVE DEVELOPMENT PROGRAM BASED ON PHYSICAL EDUCATION AND SPORT ACTIVITIES FOR YOUTH IN LEISURE TIME AND INFORMAL ENVIRONMENT**

**Žnidarec Čučković, A., Hećimović, M., Kanjugović, I., Ohnjec, K.**

As part of the integral development program, with the aim of focusing on health care, optimizing children and youth needs and stimulating growth and development, we focus on an informal environment that has been a stimulating for the cause. The importance of a spatial environment as an incentive to develop and teach children and youth by playing outdoors enables them to grow better in line with their own physical needs. The Project of the Beach Handball Camp is based on the vision of creatively designing the contents of summer holidays for children and youth, enabling them to adequately meet the primary needs for movement and play constantly being outdoors. A weekly program of activities lasting 8 hours a day was set up aimed at the full development of the children and youth through a variety of sports activities and content that will contribute to the development of creativity and creative potentials, health, general optimism and satisfaction, and hence the overall quality of life. The daily implementation program encompassed a wide range of activities such as hiking, orientation, roller skates, games on the sand, water games, pedagogical workshops, beach handball and other activities were changed in accordance with the interests and needs of children. It was stimulated through organizational, material and communication conditions to encourage and support the natural curiosity, interests and activities of children and youth. Didactic materials were pedagogically unstructured, which allowed us all to explore, manipulate, and ultimately create a new game or activity through a process with elements that take into account individual emotional, social, cognitive and physical development. We have set the theme for the development of competences focused on the knowledge of the world around us, on the community in which we live and grow and on the inescapable collaboration with other children and youth.

**ANTHROPOMETRICS SPECIFICALLY INFLUENCE REACTIVE AND NONREACTIVE AGILITY OF JUNIOR BASKETBALL PLAYERS**

**Foretić, N., Šišić, N., Sekulić, D.**

**Objectives:** The aim of this study was to evaluate relationship between some anthropometric indices and basketball-specific reactive agility (RA) and nonreactive agility (change of direction speed - CODS) at junior basketball players.

**Approach and methods:** Junior basketball players (n = 56; 16-18 years of age) participated in this study. Agility performance was assessed using basketball-specific tests for RA and CODS. **Anthropometric measures comprised:** body height (BH), body mass, body mass index (BMI), maximal reach height (REACH), arm span (SPAN), biceps skinfold, triceps skinfold, subscapular skinfold (SUBS), supriliac skinfold (SUPR), total body fat (BF). Relations between anthropometrics and agility were calculated using correlation analyses.

**Results:** Small correlations were detected between RA and body lengths (BH: 0.23-0.27, REACH: 0.29-0.33, SPAN: 0.27-0.33). Results of correlations between CODS and anthropometric indices shows similar trends as for RA, with the addition of evident negative influence of body fat measures on CODS performance (BMI: 0.13-0.23, SUBS: 0.32-0.40, SUPR: 0.34-0.36, BF: 0.30-0.33)

**Conclusions:** While negative influence of body fat on RA was logical, positive influence of body lengths highlights necessity of development of sport-specific tests in evaluation of real-game performance in team sports.

## **TRAINING CHARACTERISTICS OF YOUNGER CYCLISTS**

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The main purpose of the research was to determine the training process characteristics of younger age categories in cycling based on an online questionnaire. We were interested in studying the most frequently used approaches, methods and amount of training along with the most common form of training analysis. To this end, 99 cyclists of different age categories (junior under 17 years, junior under 19 years, elite under 23 years), who are Slovenian Cycling Federation license-holders, took part in the survey. They responded to the designed survey questionnaire as part of other measurements taken in the laboratory.

Based on the results we found that there are some differences between the age groups with regard to the most common type and amount of training. The findings show that training in groups is the most common type of training in younger age groups, whereas older cyclists usually train alone. The differences in the amount of training were most notable when it comes to a weekly and yearly amount of training of younger cyclists, which was lower. We were also able to show a difference in the amount of training between the genders. Long-term aerobic training methods have been identified as the most frequently used training method, while the use of applications proved to be the most frequent type of regular monitoring or training analysis. We found that there are some differences in the frequency of heart rate monitor and power meter use, which are more frequently used in older categories.

**DIFFERENCES IN SIMPLE VISUAL REACTION CHARACTERISTICS IN NATIONAL LEVEL CADET AND JUNIOR FEMALE HANDBALL PLAYERS**

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<sup>3</sup> University of Ljubljana, Faculty of Sport, Ljubljana, Slovenia;

This paper aims to define differences in Simple Visual Reaction Time (SVRT) and Reaction Time Variation (RTV), i.e., short-term (acute) concentration, related to age and player position in Serbian female cadet and junior national handball team members. The method used in this research was laboratory testing. All data sampling was performed using specially designed testing software that recorded visual reaction time with 1 ms precision. SVRT and RTV were calculated from 3 trials with the shortest reaction time from 5 consecutive trials. SVRT was expressed in ms, and RTV was expressed as a coefficient of variation percentage value. The sample consisted of 34 players - 19 cadets and 15 juniors. Mean SVRT of  $194.28 \pm 16.55$  and  $184.73 \pm 16.68$  ms was measured in cadet and junior subsamples, respectively. It was found that cadets have a mean RTV of  $4.74 \pm 2.41\%$  while juniors have a mean RTV of  $7.90 \pm 3.70\%$ . Results of the Factorial ANOVA have shown that there are no statistically significant differences in SVRT in relation to age, player position, and interaction of these factors ( $p > 0.05$ ). Regarding the RTV statistically significant difference was found in relation to age ( $F = 9.752$ ,  $p = 0.005$ ), while differences in relation to player position or combination of these factors were not statistically significant ( $p > 0.05$ ). Although the obtained results on SVRT indicate a positive effect of selection in relation to general population it appears that the variable is not sensitive enough at the given age and level of selection in relation to selected handball players. Differences found regarding the RTV have shown the sensitivity of the variable in relation to handball players of different age and training experience. Further research is necessary to determine the type of load, i.e., the complexity of the visual reaction time task with sufficient discriminatory value in relation to the demands of modern handball selection.



## RELIABILITY OF SPORT SPECIFIC AGILITY TESTS IN JUNIOR BASKETBALL PLAYERS

Spasić, M., Foretić, N., Šišić, N.

**Objectives:** In real game basketball performance both reactive agility (RA) and nonreactive agility (CODS) capacities are important facets of success. The aim of this study was to determine reliability of two basketball specific agility tests (Y test) aimed at evaluation of RA and CODS performance.

**Approach and methods:** Junior basketball players (n=58; 16-18 years old) participated in this study. Agility performance was assessed using basketball-specific tests for RA and CODS, which involve semi-lateral shuffling. Reliability was evidenced by intraclass coefficient (ICC) and coefficient of variation (CV). Relations between RA and CODS, as well as both performances executed on dominant and non-dominant player sides were calculated using correlation analyses (R).

**Results:** Numerical values of reliability parameters (ICC: 0.77 and 0.83; CV: 6% and 5% for RA and CODS, respectively) indicated good reliability of applied tests. Correlation coefficient (r) between dominant and non-dominant side of RA test was high (r=0.89) as well as for CODS test (r=0.85). Performances on dominant and non-dominant side were strongly correlated both in CODS and RA (R: 0.84 and 0.88, respectively), but correlations between RAG and CODS indicated independence of these two qualities (20-30% of common variance)

**Conclusions:** Reliability of sport specific tests of RA and CODS in junior basketball players was high, and tests are applicable in this sample. Somewhat higher reliability of CODS is explainable knowing the relative simplicity of movement pattern applied in CODS, than in the RA. The RA and CODS should be observed as independent qualities in junior basketball players.

**CORRELATION BETWEEN GYMNASTICS ELEMENTS KNOWLEDGE AND PERFORMANCE SUCCESS IN OLDER YOUTH CATEGORIES OF ALPINE SKIING**

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Competitive alpine skiing and gymnastics are polistructural sports disciplines. One of the differences between them is the conditions under which they are implemented. The external conditions in gymnastics are constant, whereas in alpine skiing they vary. Due to the wide impact of gymnastics on the development of motor skills, this discipline is used as a means of physical preparation of young alpine skiers.

On a sample of 22 males and 12 females aged 14-15 we wished to determine the correlation between the knowledge of gymnastic elements and acrobatics and the performance success in Mercator Cup children's competitions in alpine skiing. The sample of variables at the measurements consisted of evaluations of eight gymnastic and acrobatic skills (scale 0-5), while the performance success criterion was represented by competitors ranking in the official children's competitions in the 2013/14 ski season.

By means of calculating the Spearman's correlation coefficient ( $r_s$ ), we found that the values of four gymnastics elements, the average evaluations of all gymnastic elements and the performance success in skiing are statistically significantly associated in the group of boys. Based on the procession of data by the method of using the Mann Whitney U test we confirmed a statistically significant correlation between the average values of gymnastics variables and the performance success in competitions (sig = 0,013\*), whereas only one gymnastic element proved to be a statistic predictor in the group of girls. We can attribute the difference in results between males and females to the physical development and growth, which is determined by age and the process of individual adolescent development.

**VO2MAX LEVELS AS A RELATION TO INSPECT THE ADAPTED PHYSIOLOGICAL TRAINING STATUS AMONG YOUTH SOCCER PLAYERS**

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VO2max of 60 ml/kg/min and up is therefore suggested as the minimum fitness requirement for male soccer players to incorporate in European championship elite level. In contrast, its average is regarded as range between 55 to 69 ml/kg/min. Turning on those norms, this study inspects VO2max levels to control the adapted aerobic physiological profile among Algerian Youth soccer players. To archive this objective, 148 well-trained first division soccer players under 18 years took part in the study. Controlled by Cooper test as an index of cardiorespiratory fitness relative to physiological training response. Based on VO2max  $\pm$ 56 ml/kg/min, as a protocol. Our result admits based on obesity in terms of BFP provides better index than BMI for predicting low VO2max. Record in the benefits of VO2max up to  $\geq$  56 ml/kg/min as an advantage physiological training response than it's lesser. Conclude in this study, as a minimum fitness requirement to enhance the Algerian Youth soccer physiological demand.

**STRESS SYMPTOMS AND COPINGS IN THE COACHES IN ISTANBUL AMATEUR CLIMATE (LEAGUE)**

**Kurt, İ., Demirel, M.**

The aim of this research is to determine the methods of coping with the stresses experienced by the coaches working in the amateur cluster in Istanbul and the methods they use. The universe of the research is composed of trainers working in Istanbul amateur sports clubs. 120 coaches were included in the study with appropriate sampling method for the study. In the study, perceived stress level scale and stress coping styles scale were used as data collection tool.

The data collected in the study were evaluated in the SPSS 16.0 package program. For the analysis of the data, descriptive statistics were made, mean and standard deviation values were calculated, Kolmogorov-Smirnov test was applied to find out whether the variables were parametric and the significance level was taken as 0.05 in the test of the hypotheses in the study.

As a result of the research, it was determined that as the stressors of coaches increased, stress coping methods increased, age and sex were effective on stress sources, and stress coping had higher stress symptoms of college graduates.

The results of the research show that as coaches' perceived stress levels increase, their use of healthy coping styles, such as coping with stress, is also increasing.

**TOWARDS RECOGNITION AND PREVENTION OF PEER VIOLENCE IN GRAS-ROOTS SPORTS CLUBS – VOJVODINA CASE**

**Milovanović, I., Maksimović, N., Obradović, B., Korovljev, D., Madić, D., Drid, P.**

Faculty of Sport and Physical Education, University of Novi Sad, Republic of Serbia

The paper presents the results of a field research conducted using a focus group interview technique among coaches of grass-roots sports clubs in Serbian province Vojvodina. The research is a part of a three year long project *Sport against violence and exclusion – SAVE* funded by the Erasmus + Sport 2017 Program of the European Union, which seeks to prevent peer violence and social exclusion through physical activity. The participants of the focus-group discussion were the coaches, who spoke about the manifested forms of peer violence in their sport clubs, the frequency of violence, terms and places where violence takes place, mental and physical characteristics of a “typical” victim and “typical” bully and “typical” forms of violence faced by boys and girls. The participants in the discussion have stressed that violence in their clubs is an exception, but everybody described the examples of violence in details. The participants agreed that parents interfered “too much” in the work of the coach, which is explained by paying the fee (this is why parents believe they are in a “partnership” relation with the coaches). They also stress that parents of children/bullies deny that their child is violent and refuse any discussions and cooperation with the coach on this topic. Finally, the participants of the discussion believe that there should be some official programmes for addressing peer violence and the social exclusion in the society, which would guide the children from their early age towards tolerance and non-violence.

**YOUTH, FOOTBALL AND SOCIAL ACTIVISM: THE ETHNOGRAPHIC RESEARCH OF „WHITE STONES“**

**Perasović, B., Mustapić M.**

Institute of Social Sciences Ivo Pilar

In last two decades new wave of rigid commercialisation and commodification of football provoked various reactions from the side of traditional and passionate football supporters. Against Modern Football is a common denominator of a worldwide, heterogeneous social movement that comprises various actors and methods of fight. In contemporary networked society, this movement exist globally but it is primarily embodied in local community and bonded with youth subculture. Among many types of action (from simple slogans on banners or city walls, to boycotts, petitions, protests and riots), the practice of founding new football clubs by the fans themselves has special significance within the movement. Our focus is on Varteks Varaždin FC, Croatian example of this process, which already produced well known cases (clubs) like FC United of Manchester, FC Falke Hamburg and many others. The goal of this paper is to present key findings from our ethnographic study of the ultras group White Stones and FC Varteks Varaždin, as a part of big international (H2020) scientific project PROMISE (*PROMoting youth Involvement and Social Engagement*). Between October 2016 and January 2018, we carried out ethnographic research on the White Stones ultras group from Varaždin, which resulted in 53 field diary entries (including 21 home and away matches) and 25 interviews with core members of the White Stones. We shall analyse key dimensions of social activism and political opinions of respondents, gathered through semi-structured interviews and also their behaviour in observed situations, at football matches as well as in their everyday life.

**EMPLOYMENT AND EMPLOYABILITY OF SLOVENIAN ELITE ATHLETES: BE A WINNER IN ELITE SPORT AND EMPLOYMENT BEFORE AND AFTER ATHLETIC RETIREMENT**

**Cecić Erpič, S.**

Faculty of Sport, University of Ljubljana

**Objectives**

While the EU Guidelines on Dual Careers of Athletes (European Union, 2012) and findings of numerous recent studies, conducted in the EU, provide an overview of “dual career” arrangements to combine sport and education, far less is known about the competences related and relevant to the employability and employment of (former) elite athletes. The aim of the study is to identify these competences and to analyse the activities and the barriers related to employment and employability of (former) elite athletes.

**Method**

57 Slovene former ( $n = 19$ ) and active ( $n = 38$ ) elite athletes ( $M_{age} = 30$  years,  $SD = 8.2$ ) participated in the study, responding to the Be a Winner In elite Sport and Employment before and after athletic Retirement (B-WISER) online survey.

**Results**

The results showed that 23 athletes were employed at the time of the study (only 7 of them in the public organisations). When asked about the competences that give them an advantage in comparison with employees without an elite sport background, these five were stated most often: willingness to do more for your organisation than your direct responsibilities ( $n = 30$ ), ability to maintain relations with important others ( $n = 24$ ), ability to be flexible and change career plans if necessary ( $n = 19$ ), understanding own career interests and options ( $n = 19$ ) and awareness of own strengths and weaknesses ( $n = 19$ ). On general, former and active elite athletes perceive moderately intensive barriers in securing a sustainable employment.

**Conclusion**

Current study brings several important findings about the competence perspective (i.e. knowledge, skills, attitudes and experiences) related to the employability and employment of former and active elite athletes.

**YOUNG ATHLETES FOR THEIR SPORT: VOLUNTEERING ON LARGE INTERNATIONAL EVENTS**

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The aim of the present study was to describe the role of sport participation in the willingness to volunteer at large scale sports events, specifically willingness of young athletes for volunteering on world events in their own sport. The study used the example of the 17<sup>th</sup> FINA World Championships organised in Budapest and Balatonfüred in the year of 2017. The question was whether the time contribution and the retention of volunteers would be more influenced by volunteers' sports participation and participation in FINA sports than previous volunteer experience and engagement to local community. The analysis was based on registration data (N=2856) of volunteers participating at FINA World Championships 2017 using SPSS 18.0. The analysis described age, gender, and main activity breakdown of volunteers and the total and average number of completed shifts additional to sports participation, volunteer experience and local community. It was found that volunteers coming from FINA sports or with previous event volunteer experiences were a minority in terms of numbers within the volunteer team, however, their engagement at the event and their dedication to their sport was shown by a significantly higher number of completed shifts at the event in comparison to other volunteers. This result may call upon FINA sports to allocate more attention to building a volunteer pool among their athletes to follow upcoming events as volunteers. Such approach may provide young FINA sport athletes with competencies in connection to participation at world events as competitors and with event management knowledge and skills, furthermore, assisting their carrier decisions in years to come.



**THE EFFECTS OF VERY HEAVY RESISTANCE SPRINTING EXERCISE ON ACCELERATION, SPRINT AND JUMP PERFORMANCE IN YOUTH SOCCER PLAYERS**

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The ability to accelerate and sprint short distances is crucial to achieve optimal sport performance in majority of team sports. Resisted sprinting training (RST) is an exercise modality involving an athlete sprinting with added load using different weighted equipment. Very heavy RST ( $\geq 80$  % of body mass) compared to unresisted sprint training (UST) increase horizontal force production, mechanical effectiveness, jump performance, whilst also improving sprint performance in team sport athletes.

The aim of the study was to investigate the effects of heavy RST and UST on sprint time, vertical and horizontal jumping and sprint mechanics in youth soccer players.

Youth male soccer players ( $n=27$ ) were randomised into RST, UST and control (CON) group. Athletes performed a 4-week training intervention (5x20m RST group and 8x20m UST group) and were tested 7 days after completion of intervention. The horizontal force-velocity profile using two unresisted sprints and load-velocity profile using four progressively resisted sprints was obtained for each individual. Subjects also performed counter-movement jump (CMJ) and standing long jump (SLJ).

Only RST improved sprint times (T30, T20, T10, T5) significantly (-4.2% to -7.9% in split times) and provided small changes in sprint mechanical parameters (maximal value of ratio of force that is directed in a forward direction [RFmax], maximal mechanical horizontal power output [Pmax], theoretical maximal horizontal force [F0]). UST and CON showed trivial or non significant effects in those parameters. RST and UST both showed a small increase in SLJ and a trivial effect in CMJ, while CON decreased in both.

RST has proven to be a novel method to improve acceleration, jumping performance, sprint performance and mechanical outputs, and can be used by practitioners across a wide array of sports.

**GENERAL AND SPECIFIC PERFORMANCE IN YOUNG MALE AND FEMALE KARATE ATHLETES**

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Scientific knowledge about general and specific performance in karate is of great importance for the development of athletes as well as the karate sport itself. The benefits we derive from those results support the training and selection of talent as well as the assessment of performance in young karate athletes. The aim of the study was to investigate differences in sex and age categories (U10: 8-9 yrs.; U12; 10-11 yrs.; U14: 12-13 yrs.) in general and karate specific performance.

Thirty-three male and female karate athletes aged between 8 and 13 years were instructed to perform six general and specific tests (Speed Memory, Karate Obstacle Course, Standing Long Jump, Medicine Ball Throw, High Jump and Mawaschi-Geri test).

MANOVA (Pillai's-Trace-Test) revealed a statistically significant multivariate effect for the factor age but no significant effect for the factor sex. The Post-Hoc-Analyze (Scheffe-Test) discovered seven significant differences ( $P < 0.05$ ) between the age categories. Differences in lower extremities and hip flexibility as well as coordination are found only between U10 and U14 age categories. In the Karate Obstacle Course test differences between the groups were not significant; however, the performance of girls and boys in this test tends to increase linearly according to age. We suggest that the small sample size explained the missing significant effect for sex ( $\eta^2 = 0.158$ , Power = 0.262). However, between the age groups performance increased with age, especially in the explosive strength.

We conclude that the differences in young athletes between age categories are strong expressed in general performance. This is primarily true in strength, where the technical efficiency is less important. These findings, as well as the decrease in coordination in U14 girls may have practical importance in the development of young karate athletes.

**VALIDITY OF THE SCALES OF THE IMPORTANCE OF THE TECHNIQUE MISTAKES IN SUCCESSFUL SWIMMING PERFORMANCES**

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Qualitative assessment of swimmer's performance is based on the coach's own knowledge and experience. Mainly, they try to identify the technique mistakes and correct it. For this purpose, Stibilj and co-workers (2016) recently developed the scales of the importance of the technique mistakes in successful swimming performances. The scales, determined for breaststroke and front crawl, is based on the perceptions of experienced Slovenian swim teachers and coaches. The purpose of this study was to examine the validity of these scales by using the times of the maximal 50 meters swim test. One hundred and thirty female participated in the study. 41 and 89 from them swum maximal 50 meters breaststroke or front crawl, respectively. The swim tests were part of selection process of the candidates who applied to the study at the University of Ljubljana, Faculty of sport. Therefore, the participants could be classified as average or advance swimmers. Their swim performances were recorded. Two swim experts determined the mistakes, which appeared during participants' swimming. Additionally, the mistakes were numerically evaluated based on the criteria of Stibilj and co-workers, (2016) and summed for each participant. The validity of the scales was established by correlating the amount of numerically evaluated mistakes with time, which the participants both achieved at maximal 50 meters swim test. According to the observations, the most common mistakes during breaststroke were "insufficient gliding" and "head is above the water". In front crawl, common errors were "sinking the extending arm when inhaling" and "finish the stroke too early". By using Pearson's correlation coefficient, we confirmed a linear correlation between the amount of numerically evaluated mistakes, which occurred during swimming, and the result, which candidates achieved at the maximal 50 meters swim test. At both swimming techniques, the correlations between variables were statistically significant ( $p < 0,05$ ) and positive. This means that the candidates with lower amounts of numerically evaluated mistakes achieved better results at swim test. R values was 0,52 and 0,69 for breaststroke and front crawl, respectively. Considering the obtained results, we conclude that the scales of the importance of the technique mistakes at breaststroke and front crawl showed moderate to high level of validity for qualitative assessment of swimming performance at average and advanced swimmers.

**THE EFFECTS OF PRE-PERFORMED SEVERAL APNEAS ON A MAXIMAL 50 METERS FRONT CRAWL PERFORMANCE**

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The breathing pattern that swimmers adopt during front crawl largely depends on the swimming distance. For example, it is usual practice for swimmers to breathe every second stroke cycle during events of 200 metres or more, to adopt a more restricted pattern during shorter front crawl distances due to biomechanical advantages. Therefore, competitive swimmers use different practices to overcome the need for breathing. The aim of our study was to obtain the effects of pre-performed several apneas on a maximal 50 meters front crawl performance. Eighteen competitive and ex-competitive swimmers performed the maximal 50 meters front crawl twice. First immediately after interval set of apneas in seated position where two breatholds were performed after maximal exhalation and holding breath till second (struggle) phase with two minute brake beetwen breatholds (experimental trial) and second 30 minutes after identical apnea intervals (placebo trial). The results showed that apnea intervals did not effect on swimming time nor on stroke or breathing frequency on 50 meters front crawl (there were no significant differences in times between the experimental (EX) and control trial (CT) (EX:  $29,27 \pm 2,42$  sec, CT:  $29,38 \pm 2,42$  sec;  $p > 0,05$ )). On the contrary, there were significant differences between the experimental and the control trial in subjective perception of exertion during swimming and fatigue after it ( $p < 0,01$ ). The exertion feelings were lower and swimmers expressed less fatigue in experimental swimming in comparison with the control placebo swimming. For further studies, we suggest to familiarize the swimmers to swim with fewer breaths before the study. Moreover, similar research idea should be examined at longer swim tests, where acidosis and consequently fatigue are more severe, thus, better synchronization between breathing needs and breathing response is needed.

**THE QUALITATIVE ANALYSE OF SERBIAN AND SLOVENIAN YOUTH HANDBALL NATIONAL TEAM AT U- 20 EUROPEAN CHAMPIONSHIP 2017**

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The junior women's handball team (u\_ 20) Slovenia and Serbia at the European Championship 2017 are analysed. The official statistical database from EHF, complete personal tournament observation and method of deduction were used. All together at the tournament the teams played 56 games, scored 2804 goals (4840 shots) with 57.9 % efficiency in total. Out of sixteen teams, Slovenia ended at 12th and Serbia at 15th position (out of 16 teams). Slovenia team has better (61,0%) shot effectiveness (162goals/267 attempt) then Serbia (145goals/288 attempt) with 50, 1 % effectiveness. With quantitative analyse we found out many reasons; firsts-there is a big gap in playing model and overall quality between the first eight teams (58,9% effectiveness) and the teams ranking from ninth to sixteenth place where also Slovenia and Serbia belong; all last decade; the teams in the best 8 ranked teams were tactically and technically much better prepared; in team Slovenia and Serbia it was obvious that both teams have not enough elite- or extremely talented players to play at a similar level; team Slovenia and Serbia has a similar handball school; but after analyses we can conclude, that something in selection, training process, physical and mental preparation, is necessary to change, if reaching the first ranking part is wanted. Strategical planning in talent development would be suggested

## **EFFECT OF MAXIMAL CONCENTRIC STRENGTH ON VERTICAL JUMP PARAMETERS IN BASKETBALL PLAYERS**

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Many different studies have shown relation between vertical jump performance in squat and countermovement jump to different types of leg strength. Several parameters of squat and countermovement jump have been proved to be associated with better sports performance. Basketball is sport that requires power, strength and agility which can be correlated to different vertical jump parameters. The aim of this study is to determine the effect of maximal concentric strength of hamstrings and quadriceps to squat jump and countermovement jump parameters.

Sixty-two male basketball players participated in this study with average age of  $16.16 \pm 1.01$  years, height  $190.33 \pm 7.67$  cm and weight  $80.05 \pm 9.57$  kg and were a part of wider national team of basketball in Slovenia. After familiarisation with testing protocol we performed a standard warm up routine. First part of measurements players performed three repetitions of squat and countermovement jumps of which we examined the highest jump. After vertical jumps tests players performed isokinetic testing of hamstrings and quadriceps at speed of 60 degrees per second. Correlation was calculated with Pearson's or Spearman's correlation coefficient.

There were no significant correlations found in SJ and CMJ height and maximal hamstring strength. Also, there were no significant correlations between SJ acceleration and in SJ starting power (acceleration in first 50 ms) and hamstring or quadriceps strength. However, there was significant correlation between SJ height and quadriceps maximal strength ( $r=0,331$ ,  $p<0,01$ ) and between and CMJ height and quadriceps maximal strength ( $r=0,277$ ,  $p<0,05$ ).

Our results indicate low significant correlation between maximal concentric quadriceps strength and height of both (squat and countermovement) jumps. Based on these study, basketball strength and conditioning coaches should include exercises which include strengthening of quadriceps muscles to enhance SJ and CMJ performance.

**THE VIEWS AND EXPERIENCE OF FORMER TOP SLOVENIAN ATHLETES ENTERING A SECOND CAREER**

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**Objectives:** The purpose of the research is to understand what kind of challenges and problems await top athletes who have decided, from early childhood onwards, to follow their goals in the field of professional sport. A life of an athlete is a unique one therefore experience as well as reactions of former athletes when entering a new life can be of immense value for young athletes who are at a start of their sports careers.

**Methods:** Open ended interviews of randomly chosen former top Slovenian athletes available on web portal 'Druga kariera' were used. The analysis included 74 top athletes who have already ended their sports careers (women, n=21; men, n=53; individual sports, n=48; team sports, n=26). On the basis of these interviews, common characteristics of athletes were sought after to obtain information regarding their dual career.

**Results:** The findings indicate a) a multi-dimensional knowledge of experience of top athletes' dual careers. The athletes were only able to lead a dual career if it was planned in advance and ensured sport engagement in accordance with educational or working environment, b) in the field of sports retirement the transition to post sports life is much easier if the sports retirement was voluntary and if the athletes have already been planning and working towards a new career path during their sports career, c) the psycho-social competences that are obtained during a career in sport come of great help when adjusting to a new life and that these skills and knowledge can be transferred to the working environment.

**Conclusion:** The findings of the research indicate the need for a better support system for an athlete during as well as after a sporting career.

**THE POSITION OF YOUTH IN THE GOVERNANCE OF SPORT POLICY**

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Numerous studies over the world has been showing the importance of sport in the upbringing processes of young people, be it from the physical, social, health and also emotional reasons. Just as the same can also be seen in the reversed direction, affirming that also the processes of future development of sport and its activities has been importantly dependent on the attitudes of young people's towards sport and practising it.

Speaking from the perspective of the latter, the main aim of this contribution is to explore whether and how youth are involved in the formal institutional structures and processes of sport governance at the level of sport policy-making architecture. In this regard, we understand sport governance to be a leading mode in the contemporary democratic processes of sport policy making, and youth to be undertaking a recognisable and important role in sport governance structures and processes, just as they do in every-day exercising of sport practices.

The secondary analysis of already conducted research findings and data sets related to the topic will be applied, as well as the analysis of official policy documentation and institutional settings will be made to gather the data for the analysis of the position of youth in sport governance.



**SPORT PRECARIAT**

**Macura, D., Jeglič, B., Jordan, K.**

Sport as a very important and wide social phenomenon permeates all areas of life and every generation. But still the main part of the sport activity is connected with youth. In this sense youth is the main social resource in the area of sport. The first problem regards the orientation of trainings: athletes spend most of their time training and resting between trainings. The second problem is that there is more and more ballast surrounding sport activities. The amount of services and products, aimed to give support to athletes, is increasing rapidly. By this we mean all kinds of consultants, advocates and promoters. They are the ones who benefit directly from this, while athletes enjoy those benefits only in the case of extraordinary achievements. The only difference exists in professional sport, where athletes are paid to train regularly. The third problem is connected with hyperactivity when it comes to marketing, for which public funds are being spent. Usually the thing that is being promoted is something that is already implemented into praxis, which proves that this kind of marketing truly benefits only the ones who are behind it. The organizational form of this sort of events is usually given a name day, week or month of sport. In this regard the only benefit for the athletes is the experience, but it comes with a high price – it necessarily requires a Faustian deal, which means that the amount of effort that a person has to put in is always higher than potential benefits. And the fourth and the biggest problem is the drastic decrease of the athletes / conditions in which only a few individuals get the opportunity to thrive. There are crowds of athletes who in reality are equally good, but they are excluded and completely anonymized. In this sense the extent of precarization in sport is bigger than in any other field. This is why sport is the most suitable area for implementing universal basic income (UBI) as one of the most likely measures for achieving social stabilization of the society.

**A STUDY ON THE DETERMINATION OF UNIVERSITY STUDENTS' LEVEL OF UNIVERSITY ADAPTATION**

**Demirel, D. H., Demirel, M., Serdar, E.**

The university life, which can be considered as a transition to a new phase of life, requires to successfully meet the academic requirements, to have a healthy interaction with new entrants and to adapt to this situation as soon as possible. In the related field literature, Adaptation to the university is considered as a four-dimensional concept: academic cohesion, social cohesion, personal-emotional cohesion, and institutional cohesion. In the 2017-2018 academic year, 378 volunteer participants were employed by Akbalık in 1997 as a unique Turkish measuring instrument developed to measure university compliance. There are two sub-dimensions in the scale and these dimensions are expressed as social adjustment and academic adjustment subscales. It is a scale consisting of a total of 31 expressions and a 4-point Likert scale. High score, high level of compliance. It can be said that the loyalty of students to the university influences academic achievement.

## HEPA POLICY IN SLOVENIA

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The challenge for Health enhancing physical activity (HEPA) promoters is to tackle physical inactivity by mobilising political, organisational and community support. The planning and implementation of the strategies for health enhancing physical activities is implemented with regards to various policies, such as: health policy, transport policy, economic policy, social, regional and cohesion policy, educational policy, working environment, research policy, environmental protection and other policies.

A review of the current HEPA policy in Slovenia and its effects on the population with the emphasis on the youth population through the level of physical activity was performed. From the results of the review is visible that the problem of physical inactivity among the population in Slovenia is recognized by the governmental organisations and NGO's. Slovenia is among those EU countries that implement almost all suggested policies that promote HEPA programmes according to the monitoring framework proposed by EU commission. In spite of the efforts of all stakeholders in Slovenia working to develop the HEPA programmes, the results of recent surveys on the population show that the number of physically inactive children and population in general in Slovenia is increasing and there is no significant progress in this field however this trends are less pronounced than in other EU countries. Only the exchange of good practices, knowledge in this area and a multidisciplinary and coordinated approach by all stakeholders will help to stop the negative trends in physical activity that are currently present in Europe due to the modern way of life.

## DUAL CAREER AND CAREER TRANSITIONS: A SLOVENIAN PERSPECTIVE

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### **Objectives**

Athletic career development contains several areas of athletes' functioning, including their psychosocial development. The purpose of this study was to explore psychosocial characteristics and factors of Slovene young female athletes involved in team sports.

### **Method**

12 Slovene female athletes (age 16 – 22 years) participated in semi-structured interviews about their psychosocial level of development. The athletes came from various types of team sports. The interviews were transcribed verbatim and content analysed using the qualitative analytic software program.

### **Results**

Results revealed that young female team athletes stress the importance of several people in their athletic career, i.e. parents, coach, team players, and friends. Female athletes' parents were described as strong supporters for their dual career investments. Participants' relationship with their coach and other athletes was often described as difficult, holding several tensions and conflicts.

### **Conclusion**

For young female team athletes in this study, their relationships with significant others included both positive and negative aspects and appeared as very influential for their athletic career development. Current study brings several important findings about psychosocial aspects of young female athletes participating in team sports, which could be implemented in practical work with this group of athletes, as well as with their coaches.

## EARLY DROP OUT OF SPORT IN SLOVENE ADULT EMERGING ATHLETES

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### Objectives

Dual career of young athletes is a career with two foci: education and sports. Student athletes in Slovenia cope with two major transitions simultaneously: first transition from developmental level to mastery level in sports and a second transition from secondary school to university in education. Simultaneous transitions are stressful and can lead to an early termination of sports career. The purpose of this study was to follow up emerging adult athletes at those life transitions and explore athlete's self-reported reasons for early quitting of their sports career.

### Method

25 participants were included in the study. For instruments we used a part of the *Gold in Education and Elite Sports questionnaire: Sports and Education*, additional demographic questions and questions about early drop-out.

### Results

Almost half of the participants dropped out of the dual career and focused only on their education. The dropouts stated that the reasons for an early quitting of their sports career were education, problems in sports clubs and sports injuries. Most of them terminated their sports careers after the first semester at the university. More females than males continued their dual career.

### Conclusions

The study revealed some trends in dual career development among the participants, but due to the small sample we cannot make any generalizations about the dual career in Slovene adult emerging athletes. A larger study to obtain knowledge on characteristics of their dual career still awaits further inquiry.

Session - Challenges in the field of physical education

**ANALYSIS OF THE REASONS FOR THE TANDEM TEACHING OF THE TEACHERS OF PHYSICAL EDUCATION AND CLASS TEACHERS IN THE FIRST THREE YEARS OF ELEMENTARY SCHOOL PROGRAMME FROM THE POINT OF VIEW OF DEVELOPMENT OF MOTOR AND SPORTS SKILLS**

**Majerič, M.<sup>1</sup>, Žvan, M.<sup>1</sup>**

**Kampjut, B., Kebler Zaletel, J.<sup>2</sup>, Avbelj, P.<sup>2</sup>**

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The aim of the research was to analyze the reasons for the tandem teaching of the teachers of physical education and class teachers in the first three years of elementary school programme from the point of view of development of physical abilities. We analyzed accessible researches, which determined the influence of tandem teaching of the teachers of physical education and class teachers on the development of students' motor and sports skills. We used the comparative analysis. We found out some interesting findings that will be presented at the congress. The conclusions will be useful for narrower and wider professional public.

**PHYSICAL EDUCATION CLASSES POSITIVELY EFFECTS BODY COMPOSITION AND MUSCULAR FITNESS IN PRIMARY SCHOOL CHILDREN**

**Kapo, S.<sup>1</sup>, Čaušević, D., Doder, I.<sup>1</sup>, Kapo, A.<sup>2</sup>, Gurda, E.<sup>2</sup>, Kapo, N.<sup>2</sup>, Čuljević A., Fočo, R.<sup>1</sup>, Bandić, M.<sup>2</sup>, Džafić, S.<sup>2</sup>, Čović, N.<sup>1</sup>**

<sup>1</sup> University of Sarajevo, Faculty of Sport and Physical Education

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Regular physical activity can induce changes in body composition and overall body power of skeletal muscles. Mainly this is caused due to aerobic energy expenditure and muscular adaptations to forces during the activities. Aim of the study was to evaluate the effects of regular physical education classes on changes in body composition and muscular fitness in primary school children.

Overall 38 school age male and female children (age:  $13 \pm 0.34$  years; weight:  $49.74 \pm 9.07$  kg; height:  $157 \pm 10.36$  cm) performed regular physical education classes for 90 min per week for eight weeks. Activity consisted of two classes per week including variety of sport elements. Body composition was measured using BIA method (Tanita Scale 420BC) and broad jump as a measure of lower extremities power.

Results suggest that significant change occurred in body weight (increase  $p < 0.001$ ), fat free mass (increase  $p < 0.05$ ) jump height and flight time ( $p < 0.001$ ). Male subjects significantly achieved better jump height results compared the female participants ( $p < 0.0001$ ).

Regular physical education classes can cause increase in muscle mass and lower limb muscular power performance. It is unclear whether this occur due to biological maturation or under the influence of regular physical activity.

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The main objective of the Erasmus+ project “Intercultural Education through Physical Activity, Coaching and Training” (EDU:PACT) applies to the consistent migration flow towards Europe and the intercultural challenges, which are most of the countries in Europe are facing nowadays.

Although in most European countries, sport-educators teach culturally, ethnically and linguistically heterogeneous classes of pupils, teachers and coaches have not been well prepared for this task of intercultural education through sport. Research into intercultural education indicates that many practitioners still do not have sufficient professional competence in this area and that initial teacher/trainer education (pre-service) and continuing professional development (in-service) neither provides them with the necessary knowledge, nor covers practices, skills, competences and appropriate models to face the everyday reality in classrooms and training sessions, respectively. Hence, consistent and didactical guidelines are lacking.

EDU:PACT aims to improve quality of pre-service and in-service education strengthening the professional profile of both sport related teaching professions preparing teachers and coaches for inclusive intercultural education in and through physical education and sport. Furthermore, the development of teaching and learning guidelines, didactical concepts and study units for initial teacher/trainer/coaches education and continuous professional development towards an inclusive intercultural behaviour are the centrepiece of this project.

The project is structured into work packages (WP), each targeting a specific part of the project. While WP-1 focuses on the “Management, Monitoring and Evaluation” of the project, WP-2 outlines a “Survey and Mapping” process to assess the current situation of trainers/coaches/teachers. In WP-3, the “Module and Training Concept” will be developed and WP-4 refers to the “Piloting and Implementation”. Additional WPs describe the process of “Review and Validation (5)”, “Quality Assurance (6)” and “Valorisation and Sustainability (7)”.



**EFFECT OF SHORT FOOT EXERCISE ON FOOT ARCH AT YOUNG TRIATHLETES**

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The purpose of this study was to determine the effects of a six-week exercise program with a short-foot exercise and its progressions on the medial longitudinal foot arch (MLFA) between static and dynamic loading in young triathletes.

Sample was represented by 11 young triathletes who were measured and tested before and after the exercise intervention in the kinesiology laboratory at the Faculty of Sport in Ljubljana. Training intervention consisted of a 6-week training program, where subjects performed one of the four progressions of short-foot exercise 3-times a week at home. Exercise was performed with 5 repetitions of 2 second contraction for 3 total sets with 5 minute rest between the sets.

The size of the MLFA at static load was determined using Sit-to-Stand Navicular Drop Test (SSNDT) and during the dynamic load with Dynamic Navicular Drop (DND) method.

Acquired measurement data was statistically processed with SPSS program. The mean value of left and right MLFA for each foot was calculated before and after training program. To determine the differences in the size of the MLFA during static and dynamic loading, before and after exercise intervention, we used an analysis of the variance for repeated measurements.

Obtained results of the study indicate that the intervention statistically significantly reduced SSNDT<sub>mp4</sub> in absolute (-52.8%,  $p < 0.001$ ) and relative (-55.4%,  $p < 0.05$ ) values of the left foot and DND in absolute (-32.6%,  $p < 0.05$ ) and relative (-36.1%,  $p < 0.05$ ) values of the same foot. Other test demonstrated trend of decreasing size MLFA but didn't achieve statistical significance. From that we can conclude that intervention significantly decreases MLFA during static and to a lesser degree dynamic loading.

**BILATERAL DIFFERENCES IN GROUND REACTION FORCES DURING THREE TYPES OF VERTICAL JUMPS**

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Vertical jumping tests such as squat jump (SJ), countermovement jump (CMJ) and drop jump (DJ) are often used within different sport testing battery. Vertical jumps parameters provides us with information about acceleration, strength, power and force in basketball movements, which are important element in various strength and conditioning exercise regimes.

To date research regarding force reaction parameters during vertical jumps failed to provide us with insights into the bilateral differences, as latter may occur during testing and may be associated with improper sport specific training. It is well established that bilateral differences in lower limb strength may negatively impact sport performance and can lead to higher injury rates. Thus, the aim of this study was to assess the bilateral differences in selected parameters during SJ, CMJ and DJ jump in elite youth female basketball players.

Twenty-seven elite youth female basketball players from different national basketball teams were included into the study, with mean age  $17.37 \pm 2.97$  years, height  $178.68 \pm 6.99$  cm and weight  $70.66 \pm 10.52$  kg. After familiarisation with all three jumps technique, all participants performed at least three separated repetitions of SJ, CMJ and DJ in randomised order on bilateral force plate. Bilateral differences were calculated with Paired samples t-test in case of normally distributed variables, otherwise Wilcoxon`s rank test was applied.

There were no significant bilateral lower limb differences in SJ average force, CMJ breaking phase force, CMJ acceleration phase force and CMJ average force. On contrary, bilateral differences were obtained between in average force during DJ ( $p=0.037$ ).

Our results indicate that performing DJ from 0.25 m height can elicit bilateral differences in lower limb force, which can contribute to higher risk of future injuries.

**SPORT MEDICAL EXAMINATION IN SERBIA**

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“Sports medicine is a field of medicine which estimated positive and negative impact of sport on the body of people, and in people of both sexes and all age groups, the healthy and the sick.” – Prof. Smodlaka

The goals of sports medicine are to safeguard the health of participants in the sport through: prevention, treatment, rehabilitation of injuries and illnesses, and improving mental and physical skills necessary to achieve good competition results.

The American College of Sports Medicine's in 1988 was first introduced guidelines for physical activity to achieve: the optimal functioning of vital parameters, improve physical endurance, improve quality of life.

In Serbia Sports Medicine examinations are regulated by the Law on Sport (adapted on April 4, 2011), and implemented by the Regulations on determining the medical fitness to sports activities and participation in sports competitions. Regulations by mutual agreement by the minister responsible for health affairs and the Minister of Youth and Sport.

Sports medical examination this ordinance enacted in 2012 included in the mandatory review of all competitors. According to article 19 the Law on sport in a sports competition can participate athletes or sports expert who has in period of six months before the sport competition show the overall medical fitness to perform sporting activities. It is recommended to be reviewed by a specialist in sports medicine, all those who engaged in physical activity. This is necessary in order to prevent unfortunate events that can occur due to uncontrolled physical activity.

Methodology of sport medicine examination is also prescribed by the ordinance. Preventive examinations of children involved in sports activities include blood count, measurement of body height and body weight, ECG record a general overview by systems after the inspection inferring about abilities. Children who are registered as competitors in one of sports association in addition to this review work and stress test, and then draw conclusion and certified competitive license.

**HOW TO IMPROVE OCULO-MANUAL MOTOR COORDINATION IN AN EVOLUTIVE EXAMPLE IN THE PRACTICE OF BASKETBALL AND VOLLEYBALL**

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Abstract Manual oculus coordination can be defined as the ability that allows us to perform tasks that use both the eyes and the hands at the same time. We use our eyes for direct attention and hands to perform a certain activity. Eye-hand coordination is a complex of cognitive abilities, and should guide our hand movements based on visual and feedback. The development of eye-hand coordination is particularly important for normal child development and school learning. The oculo-manual coordination is fundamental for the development of literacy and, moreover, we use it daily in an infinite number of activities of our daily life, such as when we cook, draw, insert the credit card into the ATM, type in the computer, we launch and / or collect items. In fact, when we drive, we use the eye-hand coordination in an uninterrupted way: based on the information on the journey we perceive through the eyes, the hands constantly act on the steering wheel. Almost all the activities of our daily life require eye-hand coordination, so it is important to stimulate and improve it. It is usually stimulated in the preschool and child age of the child for the development of thin and thick psychomotor, but also in adulthood is important

**THE TREND OF DEVELOPMENT OF MORPHOLOGICAL MEASURES AND MOTOR FEATURES OF TALENTED SLOVENIAN VOLLEYBALL PLAYERS AGED 14 AND 15**

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The process of evaluating talented young volleyball players from each generation begins at the Tournament of regional national teams (The Volleyball Association of Slovenia). In addition to changing technical-tactical knowledge of the game, measurements of selected characteristics and features were also realized, and their results represent the basis for the evaluation of talent of a particular generation and of a particular individual player.

The research includes the trends of development of the results for certain generations of volleyball players (2004, 2006, 2007, 2008, 2015, 2016, 2017) and the statistical significance of the difference between them was determined. The results obtained from 554 volleyball players aged 14 and 15 were analyzed. The battery of measuring instruments included tests of morphological measurements (the results of seven generations: body height, the height of the reach, body weight) and motor skills (the results collected from seven generations: the takeoff height according to Sargent, reach height from a running start, reach height in a block, and the results collected from four generations: throwing a medicine ball, pirouettes, hyperextensions). The basic parameters of descriptive statistics were calculated. The results of the generations were compared using a single-factor analysis of variance.

The analysis has indicated that the results for body height, reach height, body weight and takeoff height according to Sargent, reach height from a running start, reach height during a block and throwing a medicine ball improved from one generation to the next. The results for hyperextensions and the pirouette produced a wave-like shape, but a trend of improvement in the results was determined from the first to the final measurement. A positive trend of improvement of the results among selected generations in some of the tests was also statistically significant at the 5% level (body height –  $p = 0,00$ ; body weight –  $p = 0,00$ ; reach height from a running start –  $p = 0,00$ ; reach height in a block –  $p = 0,00$ ; throwing a medicine ball –  $p = 0,00$ ; pirouette –  $p = 0,00$ ; hyperextensions –  $p = 0,00$ ). The differences are not statistically significant for the results for reach height ( $p = 0,15$ ) and takeoff height according to Sargent ( $p = 0,16$ ).

The findings, based on results compiled over a period of ten years, regarding some of the features and characteristics important for success in volleyball, indicate an essential improvement in them, which is an important fact. It is probable that these findings are a part foundation of a new elite and of more stable success of Slovenian male national representatives in all categories.

## IDENTIFICATION OF TALENTED CHILDREN IN SWIMMING

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Talent identification (TID) programs usually use tests results and prediction of possible extraordinary performance in selected sport. However, one of the several definitions using additional dimension of talent is: talent currently show an advanced performance in observed skill, without specific training. Therefore, the need for an absent of regular training of subjects under identification should be included. Therefore, TID program we investigated consisted of two categories of talent: TALENT 1, represented by swimming velocity reached at competition, combined with training frequency and TALENT 2, represented by the rate of increasing of swimming velocity during past three years. The aim of the study was to observe how presented criteria will differentiate between young swimmers. We have used competition results in 100m, 200m, and 400m crawl of more than 100 children (age: 15 and 14 yrs) who compete on national level. Their competition swimming speed and training frequency were criterions for TALENT 1 identification. A computer program sorted subjects according to the high swimming velocity combined with low training frequency. Results showed that in this age swimmers already trained more than 3 times per week and most of them were not TALENT 1, but already trained subjects. Therefore TALENT 2 criterion was a dominant criterion: the rate of increasing of swimming velocity in the past 3 years. This criterion was more sensitive for talent identification of the observed age of swimmers. Using of both TID: TALENT 1 and TALENT 2 reduced errors of evaluation. However, such evaluations should be repeated yearly for enhancing accuracy of evaluation. Using solely national level of swimmers was not the best level for TID. Regional level of swimming competition can evaluate larger number of less trained but talented swimmers.

**SPORT SELECTION ON THE BASIS OF SOMATOTYPE**

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Analysing of somatotypes may give guidelines for selection in sports activities and may lead to avoiding mistakes for selection of potential athletes and rejecting of some children or incorrectly selecting. For boys in puberty, muscle mass increases and that is the main reason for increasing maximum oxygen intake and improving the endurance for sports achievement. In training for running on middle distances aerobic energy systems are involved and lead to increase endurance. The aim of the research was to determine the effects of the training process for runners on middle distances on the somatotype to get guidelines for selection in the youth age of the male population. The sample consisted of 168 male respondents (16 years old). By analyzing of changes in percentage of distribution of experimental group in six types of predispositions for a particular sport, performed by the statistical analysis of  $\chi^2$  test, statistically significant difference (29,59) was established which indicate that between the initial and final state of somatotype distribution of experimental group after training process increased the percentage of respondents who have a talent for sport by 6.97%, then those who have predispositions for endurance sports by 9.30% and predispositions for sports for 6.98%. The training process for runners on middle distances had positive effects on the somatotype of respondents and can be used to change the somatotype. The selection in youth age of male population must be systematic since this research has shown that targeted and programmed activity can change somatotype and most likely and the ability of respondents.

**THE BATTLE BETWEEN “MAN” AND “WOMAN” - MEDIA INTERPRETATION OF TINA MAZE**

**Bartoluci, S., Doupona Topič, M.**

Sport is uppermost constructed in the mass media as a male domain. Extensive research into media representations of sport has pointed to the dominance of gender as a framing device (Wensing & Bruce, 2003). In this paper we will put focus on how media reproduces, legitimates, and challenges gender ideology, using the case of Tina Maze, former Slovenian World Cup alpine ski racer and two-time Olympic gold medal winner. The public picture of Tina Maze was a battle of masculinity against femininity. When she was winning, media described her as “gladiating Maze”; when she was not good enough, they pointed out her woman’s nature calling her just “Tina”. In our paper we have used Wensing and Bruce (2003) five key techniques or unwritten rules employed by the media to suggest appropriate femininity (gender marking, compulsory heterosexuality, emphasize appropriate femininity, infantilization and non-sport related aspects). In analyzing different narratives which media produced, content analysis and discourse analysis have been implemented in the sample of all articles that were published in three Slovenian newspapers (*Dnevnik*, *Delo* and *Ekipa*) during three seasons, from 2013 till 2015, when she retired.



**SPORT AND YOUTH WITH DISABILITY: AN EXPLORATORY STUDY ON PARENTAL BELIEFS**

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**Background:** children with disabilities do not participate in sports activities as much as their peers without disabilities, due to different physical and social environmental barriers (WHO, 2004; Shields et al., 2012).

Social barriers refer to the lack of support or to negative attitudes of others that may hinder participation on an equal basis with others (WHO, 2001).

In developmental age, parent play a key role in sport socialization. In this regard, several studies have shown a significant correlation between parental beliefs and children sports participation, suggesting that when parents attribute value to sport and expect it to be a positive experience for their children, they are more likely to create opportunities for their children to participate (Horn et al., 2007; Welk et al., 2009; Magnanini et al., 2018).

Other studies suggest that child's disability is associated with parental fears and concerns due to which parents discourage their children to take part in sports activities (Boufous et al., 2004; Stuart et al., 2006; Piskur et al., 2012; Shields et al., 2016).

However, no study has been conducted about the comparison between parents of children with and without disabilities.

**Objectives:** To verify if parents of children with disability have “more negative” beliefs about sport than parents of children without disability.

**Methods:** a questionnaire, adapted form Fredericks et al., (2005), was administered to a purposive sample composed by 60 parents of children (10-12 years), divided in 30 with disabilities (15 sports practitioners, 15 non-practicing) and 30 without disabilities (15 sports practitioners, 15 non-practicing). Data were analyzed with the support of SPSS, using Cramer's V index.

**Results:** no statistically significant differences emerge between groups.

**Conclusions:** results suggest that parental beliefs do not explain differences in sport participation between children with and without disabilities.

## DIFFERENCES IN MOTIVATIONAL ORIENTATION AND PSYCHOBIOSOCIAL STATES AMONG YOUNG SPORTS ITALIAN TALENTS

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The psychological characteristics play a key role in the development of Sport Talents (ST). The purpose of this study was to investigate the motivational orientations and psychobiosocial states in young Italian ST, by analyzing athletes of different sport, age and gender.

Participants were 123 young athletes (71 Males; 52 Females, 49 aged 13-14y and 74 aged 15-17y from Emilia-Romagna, Italy, practicing the following sports. [ENDURANCE (EN): Cycling n=12, Canoe n=12, Swimming n=7, Pentathlon n=9, Cross-Country-Skiing n=7, Triathlon n=9; SITUATIONAL (SIT): Basketball n=6, Volleyball n=8, Handball n=7, Hockey n=4, Tennis n=8, Alpine-Skiing n=1), TECHNICAL AND STRENGTH-POWER (TSP): Track&Field n=19, Sport-Dance n=8, Figure-Skating n=6]). Athletes completed the Task and Ego Orientation Self Questionnaire (TEOSQ) and a Psychobiosocial Questionnaire (PBS), in order to assess the motivational orientations and psychobiosocial states respectively.

Significant differences were detected in the Ego orientation score between genders ( $p=0.034$ ), and between EN and both SIT and TSP ( $p<0.01$ ). Ego mean scores in males were 28 and 23-24 for EN and SIT/TSP, respectively, while in females 23 and 19, respectively. Higher Ego scores ( $>30$ ) were obtained by males competing in Triathlon, Cycling, Canoe and Figure Skating, while the highest values ( $>23$ ) among females were recorded in Swimmers, Triathletes and Volleyball players.

Volleyball and Basketball players and Hockey and Tennis players showed the lowest values among males ( $<21$ ) and females ( $<18$ ), respectively.

Genders did not show significant differences in the Task orientation component. Sport-Dance, Alpine-Skiing, Cycling and Swimming athletes showed the highest scores ( $>36$ ), significantly different from the lowest, represented by Pentathlon, Basketball and Handball ( $<34$ ).

Significantly lower scores ( $p=0.009$ ) for negative PBS were detected in 13-14 years old athletes compared to 15-17 years old group, with PBS- scores of 4.3 vs 6.2 respectively.

High task orientation and low negative PBS scores characterize a high percentage of the entire group.

## CHRONIC EFFECTS OF REGULAR EXERCISE AND PHYSICAL ACTIVITY ON COGNITIVE FUNCTIONS

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### INTRODUCTION

Recent findings showed how the cognitive function could be enhanced by the Physical Activities (PA). Through a Free Recall Memory Test (FRMT) it was highlighted how the acute exercise could improve the storage capacity of children's memory. The present investigation was run to understand whether PA has chronic impact both on physical and cognitive functions.

### METHODS

93 middle school students ( $12.22y \pm 0.93$ ) were selected from a Rimini school. 47 female and 46 male students performed in three different days Motorfit physical Tests, International Physical Activity (IPAQ-C) and the self-esteem questionnaires and a Free Memory Recall Test. Students' physical-skills has been related to the cognitive skills through a multivariate analysis of the variance (MANOVA). For each student we assigned values of 1 if they performed the test over the discreet value of the guide line, while 0 if they performed below of it. To evaluate the level of physical activity reported by the children, a linear regression was computed with IPAQ-C scores as dependent variable and gender and the dummy variables for each test as independent variables.

### RESULTS

Significant effect emerged from IPAQ-C, gender, speed and endurance. The MANOVA analysis, instead, revealed a significant interaction for speed and sex for both the memory tasks ( $F = 4.92, p < .01$ ). Specifically, the high-speed participants were able to storage more words than slower ones both in the first and second session of the FRMT. Moreover, differences between female and male were found. Males have better memory abilities in task 1 than females, while no differences emerged in memory task 2.

### CONCLUSION

The present investigation revealed a chronic effect of the physical activity on speed capacities and on the storage capacity of children's memory, providing evidence that physical exercise could enhance some cognitive functions in children.

## RELATION OF CHILD'S BIRTH WEIGHT TO MOTOR SKILLS IN PRESCHOOL CHILDREN

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Low birth weight (less than 2500 g) is a major public health problem particularly in developing countries (Tavasoli et al., 2014). Low birth weight newborns are considered to have global developmental delay risk in motor, cognitive and language domains (da Costa Ribeiro et al., 2017). Neurodevelopmental follow up, long term monitoring and well-resourced health services are needed to ensure proper neonatal care and early intervention programs (Ballot et al., 2012). Main purpose of this study was to determine relation of birth weight to motor skills of preschool children. Participants in this study were 1189 kindergarten children (3-7 yrs, 115,59cm, 21,25kg). Motor skills were measured using Test of Gross Motor Development 2 (TGMD2)(Ulrich, 2000) and Bruininks-Oseretsky Test of Motor Proficiency 2 (BOT2)(Bruininks&Bruininks, 2005) while birth weight and complications during pregnancy and childbirth were reported by parents. Correlation analysis was used to determine relation between birth weight and motor skills in children. Univariate analysis was used to determine the differences in motor skills in children in different categories. Correlation analysis showed there are no relation of child weight at birth to overall motor development ( $r=0.034$ ,  $p>0.05$ ) or to child motor proficiency ( $r=0.057$ ,  $p>0.05$ ) in preschool children. No differences were found in motor skills between low birth weight children (<2500g) compared to normal birth weight children. However, poorer motor skills were found in children whose mothers reported complications in pregnancy and childbirth (CPC)(TGMD2=89,25; BOT2=45,84) compared to children with no reported CPC (TGMD2=93,72, BOT2=49,31)( $F=6.76$ ,  $F=6.97$ ;  $p<0.01$ ). Early assessment and detection of motor deficits are necessary for implementation of interventional program, and future reduction of developmental problems in children (Tavasoli et al., 2014). Our study shows motor deficiency in preschool children born after CPC. Practically, we can suggest that following CPC, child should be enrolled in preventive early childhood motor stimulation and interventions.

**PAIN PERCEPTION AND PAIN TOLERANCE IN SPORT**

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There is an inevitable association between pain and sport. Regardless of discipline, many athletes experience pain on daily basis to obtain a higher level of their performance and they are put under expectation of high pain tolerance. However, pain is also one of the limited factors that can disrupt athletes' performance. The connections between pain and its negative consequences in sports behaviour is related to an injury. Coordinate-aesthetic sports (e.g. gymnastics, figure skating, ballet dancing) are quite specific due to an important qualitative aesthetic aspect of valuation in addition to their performance. These sports are also known by a high amount of injuries, perceived difficulty of moves and workload exposure with fatigue as one of the injury factors.

The aim of this paper is to offer a brief theoretical review of pain perception and pain tolerance in sport in general as well as focusing on these specific sports disciplines.

**ASSESSMENT OF PSYCHOMOTOR DEVELOPMENT OF PRESCHOOL CHILDREN**

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Preschool age is a very important stage of life for improving psychomotor skills such as running, jumping, throwing and others. These fundamental motor skills influence and form the foundation for health, social, educational and emotional aspects of children life. Early detection of level of psychomotor development could help us with identification of children with motor impairment, prepare appropriate intervention program for them and prevent potential problems in other domains in children's life. Nowadays, we have an enormous number of diagnostic methods, which are intended to assess the psychomotor development of children. Before we use one of them for research or diagnostic work, we must consider many aspects.

This overview study discusses the different aspects of assessment methods of psychomotor development of preschool children. Our aim was to define the psychomotor development, characterize different types of assessment methods and provide review of the most used methods of psychomotor development. In this study, we analysed studies dealing with assessment of psychomotor development of preschool children, covering the period from 2010 to 2018, searching for the terms „assessment of psychomotor development, assessment of motor development, psychomotor development methods” AND „preschool children, pre-schoolers”.

In literature review, we identified discrepancy in terminology, therefore, first part of the study explains the difference between terms – psychomotor development, motor development and psychomotoricity. Then we described two types of psychomotor methods – process-oriented and product-oriented assessment. Last part discusses important aspects of the most used assessment methods for preschool children and reveals their advantages and disadvantages. We believe that results could be interesting for anybody, who intends to evaluate psychomotor skill in preschool children, for example psychologist, doctors, teachers, coaches and parents.

**ROLE OF PERFECTIONISM AND PARENT-INITIATED MOTIVATIONAL CLIMATE IN OVERTRAINING SYNDROME IN ADOLESCENT ELITE ATHLETES\***

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The overtraining of an athlete is affected not only by the training factors and overall physical load, but also by personality traits of the athlete. The perfectionism is considered to be a significant personality characteristic of an athlete's attitude towards sporting activity. Particularly during adolescence, athletes may be subject to the influence of the social environment, including parental influence. Parents' attitudes to sports, as well as their attitudes to achieving their own goals, influence how the athlete perceives his own success and failure. In particular, performance parent-initiated motivation may cause tension and anxiety, and is therefore considered a risk factor for overtraining syndrome. Harwood et al. (2015) demonstrated that the performance motivational climate encourages also the development of perfectionist tendencies among athletes. The aim of our study was to find out whether the relationship between the motivating parental climate and the athlete's overtraining can be mediated by the perfectionist tendencies of the athlete. These were measured by the Sport Multidimensional Perfectionism Scale 2 based on the 3-dimensional concept of perfectionism (socially conditioned perfectionism, self-oriented and other orientated perfectionism). The Profile of Mood States Questionnaire was used to measure the degree of negative affects associated with overtraining; the motivational climate was captured by the Parent-Initiated Motivational Climate Questionnaire (PIMCQ-2). The research sample consisted of 153 Czech athletes aged 14-19 ( $m=16.20$ ;  $sd=2.07$ ), with 24.8% females. Athletics (52%), tennis (29%), and swimming (19%) were sporting activities; an inclusive criterion for inclusion in the study was participation in national or international competitions. The regression analysis confirmed the PCP-Sport, DAA-Sport and Org-Sport perfectionist dimension as a mediator of the relationship between performance father-initiated motivational climate and overtraining of the athlete. The DAA-Sport was the only significant mediator for mother-initiated climate. Thus, fathers' approach to sports discipline may have a greater impact on athletes.

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**RELATIONSHIP BETWEEN PARENT-INITIATED MOTIVATIONAL CLIMATE, MOTIVATION AND OVERTRAINING SYNDROME IN ADOLESCENT ELITE ATHLETES IN COLLECTIVE SPORTS\***

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The aim of the study was to explore the relationship between parent-initiated motivational climate, motivation of young elite athletes in collective sports, and their influence on symptoms associated with overtraining syndrome. Our previous studies suggested a relationship between the parent-initiated motivational climate and the degree of internal and external motivation of the young elite athletes. We assumed that motivation could be a mediator of the relationship between the parent motivational climate and overtraining. The motivation was measured using the Sport Motivation Scale, 7-dimensional questionnaire based on the theory of self-determination. The extend of overtraining was indicated by Total Mood Disturbance score resulting from the Profile of Mood States. Further, the Parent-Initiated Motivational Climate Questionnaire (PIMCQ-2) was used. The research sample consisted of 230 boys aged 15-19 years ( $m=16.93$ ;  $sd=1.81$ ), classified as elite athletes competing at national or international level. Our study was focused on collective sports; soccer and ice hockey are among the most popular sports in the Czech Republic and have a wide base of young athletes. For this reason, our sample consisted of young footballers (58%) and hockey players (42%), selected by the convenient sampling method. The results linear regression analysis showed the significant impact of the motivation climate created by the father on self-determination of the athlete, but also on the mood disorder symptoms related to the overtraining syndrome. The influence of the mother-initiated motivational climate was not confirmed. It seems that the mastery father-initiated motivational climate increases the degree of self-determination and consequently reduces the rate of overtraining, while the performance motivational climate reduces self-determination, which is associated with an increased extend of overtraining. The results of the present study correspond with the conclusions of past studies that confirmed the significance of the influence of the father, especially in the case of the sporting sons.

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**POSSIBILITIES FOR PROFESSIONAL DEVELOPMENT AND CO-OPERATIONAL TEACHING IN PHYSICAL EDUCATION FROM PERSPECTIVE OF PE SPECIALIST WITH DIFFERENT WORKING EXPERIENCE**

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Teachers have a crucial role in fulfilling quality education. In this regard, their education, competences and motivation are the key factors for successful implementation of PHE curriculum and realization of PHE process. This paper analyses two important aspects closely related with PHE teacher's effectiveness: the possibilities for professional development and possibilities to extend their competences in teaching PHE at elementary level in primary education. The aim of this study was to investigate the differences in teachers opinions regarded years of their working experience upon the issues related with continuous education, opportunities for professional development and possibilities to extend their competences in co- operational teaching with classroom teachers. The study was realized on a sample of 40 PHE specialists that deliver PHE from 6<sup>th</sup> to 9<sup>th</sup> grade in 15 primary schools in Republic of Macedonia. Differences between groups were determined using chi – square test. The results suggested that PHE teachers consider that continuous education and different forms of professional development are needed mainly with to keep step with changes, innovations and new trends in PE teaching, but their opinions are divided when referring to involvement of technology and participation in professional networks of teachers. Regarded the possibility to extend their activities in the segment of elementary primary PHE, PHE teachers` consider it possible, both as independent or as cooperation teaching with classroom teachers. Most of the interviewed teachers also consider that the initial education that they had is give them competences to be involved in this segment. Based on results from chi – square test there is no statistically significant differences in teachers opinions regarded the years of their working experience. The paper emphasizes that professional development and interest for continuous learning is more likely to be related with personal characteristics of the teachers and not with years of working experience.

**IMPLEMENTATION ISSUES IN SCALING UP A WHOLE-CHILD INITIATIVE OF PHYSICAL ACTIVITY PROMOTION**

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Most common paradigms to disseminate good practices start by testing a small samples to move on with a replicability study and finally expand to a large scale. An advanced paradigm to build evidence necessary for large scale dissemination is one that considers the bidirectional relationship between implementation and adaptation and the need for impact evidence to be applied in new implementation contexts.

This study aims to describe the protocol of an ecological evaluation model employed to perform a replicability study at Italian national level of a whole-child initiative of school-based physical activity promotion. This initiative, named »Joy of Moving«, pursues goals of motor, cognitive and social development by means of designed physical activity games. The replicability study protocol consists of multiple levels of information gathering from the different actors involved. One hundred-fourty teachers, including one coordinator of the »Joy of Moving« methodology, parents, school principals from 239 participating schools, and local and regional coordinators of Physical Education were involved in a participative evaluation extending from the school to the community level. The protocol comprised elements of process and outcome evaluation with a major focus on the implementation process, its features and the factors influencing it and its adaptability to different school settings. Key elements of this mixed quantitative and qualitative approach were an initial needs analysis and the evaluation of facilitators, constraints and barriers acting on the implementation, as well as the outcomes of the »Joy of Moving« on children's enjoyment in physical activity and social skills in classroom behavior.

**APPLICATION OF FITNESS PROGRAM IN A PURPOSE OF HEALTH IMPROVEMENT**

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In younger ages, when the period of puberty is the most intense, girls are not active in sports as boys are and this is one of causes of accelerated accumulation of fat tissue and termination of developing motor skills. In order to find ways of involving young girls in sports activities, a sample of 22 respondents 16 years old is conducted fitness training program aimed at improving the strength in order to determine their effects on the health of the respondents after eight weeks of their implementation, by adjusting their body compositions and mobility and stability (FMS method) whose changes are positive in terms of health indicators and can be a good predisposition to dealing with a variety. The success of the implemented program was verified because after the implemented program a statistically significant difference was found between the groups of mobility of the experimental subjects in relation to the control group ( $t = 5.721$   $p = 0.000$ ) and showed a positive effect on the body composition in the sense of reducing the percentage of body fat segmentally. Therefore, the hypothesis that a fitness program aimed at improving strength in young girls will have a positive effect on reducing the percentage of fatty tissue, but also on increased mobility and stability, what suggesting on need to conducting similar researches to enable girls to doing sport activities that not require high-intensity efforts but have a positive bearing on their health status.

**EXAMINATION OF THE LIFE SATISFACTION AND HAPPINESS LEVELS OF THE STUDENTS WHO ARE STUDYING IN SPORTS EDUCATION INSTITUTIONS**

**Hanci, S., Demirel, D. H., Demirel, M.**

The extent to which life satisfaction and happiness take place within the aims of life and how to provide it is a subject that has been discussed throughout human history. Life satisfaction and happiness give meaning to the life of the individual and to live a happy life is among the most important life goals of people. Research In the 2017-2018 academic year, 800 volunteer participants of the faculty of education and sports sciences were given the Life Satisfaction Scale and the Oxford Happiness Scale together with the Personal Information Form. The Life Satisfaction Scale (LSS) was developed by Diener, Emmons, Larsen and Griffin (1985) in order to measure the general life satisfaction of the individuals are self-assessment scale. The scale is answered by marking the degrees between (1) and completely appropriate (7). Low scores from the scale (minimum 5) indicate low life satisfaction and high scores (highest 35) indicate high life satisfaction. Students' happiness levels were developed by Hills and Argyle (2002). The scale was developed by Doğan and Çötök (2011). For the scoring of the Oxford Happiness Scale, 1 (disagree), 2 (mostly disagree), 3 (slightly agree), 4 (agree) 5 (mostly agree) and 6 (totally agree) satisfaction and satisfaction levels.

## ACROBATIC R'n'R VS. FIGURE SKATING - DIFFERENCES IN EXPLOSIVE STRENGTH

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The aim of the paper was to examine the differences between explosive strength between female and male Acrobatic R'n'R dancers and Figure skaters.

The subject sample consisted of 80 Croatian competitors in Acrobatic R'n'R and Figure Skating (60 females mean age  $13.50 \pm 2.24$  and 20 males, mean age  $16.65 \pm 4.21$ ). All subjects were tested in the Sport Diagnostic Center of the Faculty of Kinesiology, University of Zagreb. According to the motor test protocol for explosive strength testing, which consists of 7 tests (sprints at 5, 10 and 20 m, CMJ, CMJmax, CMRJ in 15 secs and standing long jump). T-test for independent samples per group ( $p > 0.05$ ) showed statistically significant difference between acrobatic R'n'r and skater dancers, while no statistically significant differences were found between dancers and skaters. Acrobatic RnR dancers on average achieve better results in MES10m, MES20m, MESCMJ, MESCMJmax, MESCMRJ, MESSDM variables, while in MES5m variables there are no statistically significant differences. The results obtained can be interpreted from the aspect of difference in anthropometric characteristics (height and weight ratio and subcutaneous fat tissue), different training methodology, different biomechanics of movement and different equipment. The pair dance in the acrobatic RnR can be defined as ballistic training because the partner's movements dominantly imitate lifting, throwing and jumping. In acrobatic R'n'R lower extremities muscles are more activated while in figure skating the maximum foot force transfer is disabled because of skates (limited plantar and dorsal flexion). Also, it is important to note that in figure skating, when it goes about explosive strength skaters use the transfer of frontal force (speed achieved by sliding) into vertical force as well as burial of ice skates. In acrobatic R'n'R explosive strength transfer goes from standing position. Structure of tests were more similar to acrobatic R'n'R movements than figure skating

**THE SPEED OF THROWING BALL IN DIFFERENT PERIODS OF TEACHING HANDBALL ELEMENTS**

**Ohnjec, K., Hećimović, M., Žnidarec Čučković, A., Kanjugović, I.**

Future teachers of PE, in Faculty of Kinesiology, Zagreb, are also attending the Handball College. The same content includes teaching the different handball shootings. Aim of this research is to study the speeds of ball in different shooting for a 46 student. The set of variables contains tests of ball speed from the standing position shot (MJ), then from the base shot (OU), and from the jump shot (SŠ). The flight speed was estimated by the radar gun (Stalker ATS) in the km/h units, three times in each mode of shooting. Measurement was conducted in two time points during the course in the summer semester 2017/2018. years. The first measurement was carried out after the first lesson teaching and the second measurement a month later. The average speeds in the first point were: MJ - 59.25; OU – 61.60 and from SS - 61.62 km/h. At the second point of measurement, the average results were 59.36 (MJ); 61.33 (OU); and SŠ 61.33 km/h. Using the t-test for the dependent samples, it was found that there are no statistically significant differences in the observed set of variables in two time points. The obtained results can be interpreted through the methods of directing and evaluation of the teaching process as well as through the program effects for the improvement of the explosive power type of throwing. Contemporary teaching should be directed to the student with the collaborative role of the teacher who, by planning and programming, takes into account the curricular context with all the particulars. Evaluation as an important part of the educational process occupies a significant place here, as it offers feedback on teaching, defining basic quality teaching features, defining measurable indicators, and providing the ability to use new tools to evaluate, self-analyze and improve the teaching process by all participants.

## TIBIAL MUSCLE CO-CONTRACTION DURING MEDIAL AND LATERAL INCLINE RAMP WALKING

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### **INTRODUCTION:**

Muscle co-contraction is the simultaneous contraction of agonist and antagonist muscles crossing a joint (Smith, 1981), which increases stability and stiffness in the target joint (Kornecki, 1992). Greater muscle co-contraction appears when subjects walk on unstable surfaces or when learning and performing different motor tasks. When walking is performed on unstable conditions, like incline ramp in this study, co-contraction increases due to lack of stability (Nagai et al., 2012).

### **METHODS:**

In this study, 32 male subjects ( $21.09 \pm 3.82$  age,  $1.82 \pm 0.85$  m,  $80.52 \pm 15.87$  kg) participated who performed normal walking (NORM), walking on lateral (INV) and on medial inclined ramp (EVE). During these types of walking, we monitored the EMG of six tibial muscles (PL, PB, TA, SOL, GM, GL), which were normalized to corresponding isometric MVC. For calculating the co-contraction value of two muscles, we used the co-contraction index (CCI) using the method of Rudolph (Rudolph et al., 2000; Chen et al., 2018;). When performing INV, we calculated CCI by the value of TA and other five tibial muscles during incline walking. When the subjects performed EVE, we calculated CCI by the value of PL and other four tibial muscles' EMG activity during incline walking.

### **RESULTS:**

The results showed significantly increased ( $p < 0.05$ ) CCI values in EVE (PL/TA, PL/SOL, PL/GM, PL/GL) and INV (TA/PL, TA/PB, TA/SOL, TA/GM, TA/GL) in comparison to the NORM type of walking.

### **CONCLUSION:**

Changing the foot position and performing walking on different ramp inclinations increase the co-contraction of tibial muscles. The results showed that the triceps sura muscle is most active during normal walking. Different results appear in EVE, where peroneal muscles take the primary role of muscle agonist and therefore increase CCI. Similar results are observed in INV. TA, as the foot invertor, is the most active muscle in INV, which causes higher CCI value in comparison to other tibial muscles.

**STUDY ON CORRELATION BETWEEN POSTURE AND SPORT**

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Abstract Posture is the position of our body in space; understood both as an attitude that the body assumes with respect to the supporting surface, both as an interrelationship between the various skeletal segments. In physiatrics, orthopedics, dentistry, ophthalmology, neurology, dietology etc. we are now talking about posture. In fact, posture studies, thanks to technological innovations, have made great strides in recent years. But what determines an individual's posture? The postural tonic system determines on the person's posture, complex neurophysiological and biomechanical mechanisms, where the various parts of the body are in relation to each other. Schematically we can say that a disharmonic posture causes dysfunctions of various disorders gravity, from back pain, headache, joint and muscle pain, as well as predisposition to trauma, injuries, muscular disorders (sprains, cramps, etc ...). The Posturologist performs a global functional clinical diagnostic assessment of equilibrium postural as a whole, evaluating with specific tests on the equilibrium (vestibular receptor), test on visual function (ocular receptor), tests to determine if there are occlusal interferences, coming from the masticatory system (teeth and jaw) that could condition the position of the spine, test to assess the position of the foot, test for evaluation musculoskeletal system, and other kinesiological tests. In addition, through computerized devices such as the "stabilometric platform", the exact podalic supports performing, examinations: baropodometric and stabilometric, both in position static that in dynamic trend. The posturologist determines an analytical and functional balance of the postural system and the individual receptors, evaluating the situation from a psychosomatic point of view, or trying to understand to what extent the psychological aspects come into play on the subject's posture. Often incorrect postures are identified that are specifically related to some emotional and character traits of the subject.



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