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PROGRESO PARA NUESTRO DEPORTE MEDIANTE CONOCIMIENTO

2017

Annual Compilation of Wrestling Research



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CSC Sports Photography

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The Annual Compilation of Wrestling Research 2017 is compilation of published wrestling-related research during 2017 is provided by the International Network of Wrestling Researchers (INWR). The INWR is the largest scientific support group for a sport in the world! Our group has grown to over 400 academics, scientists, doctors and wrestling professionals, from 80 countries who are involved with the sport of wrestling. (www.inwr-wrestling.com) Our Mission Statement is:

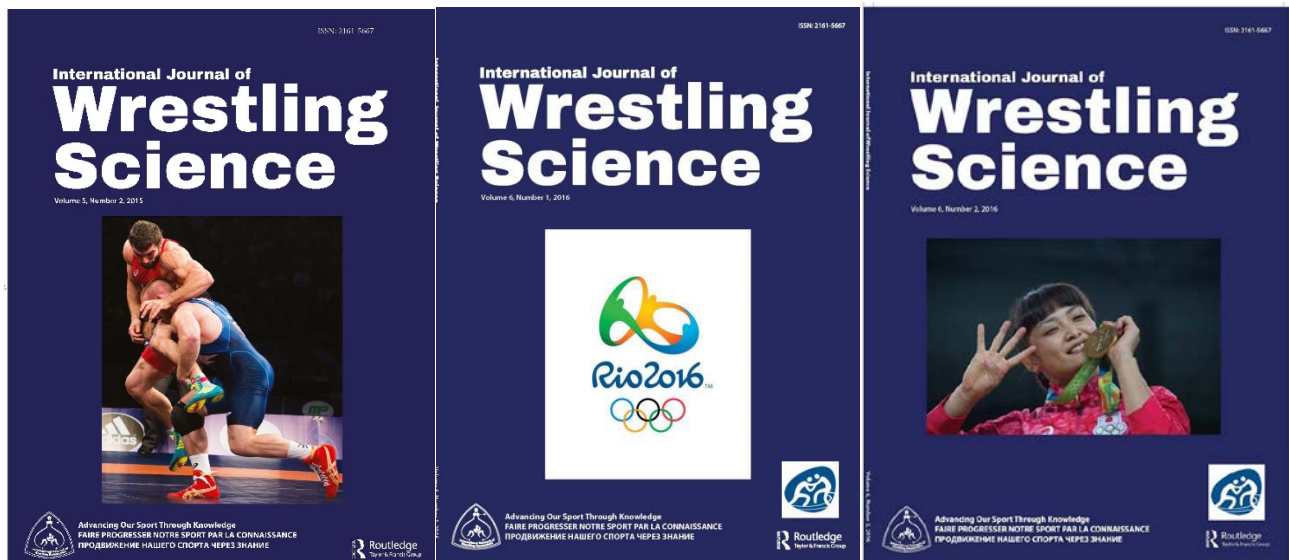
The International Network of Wrestling Researchers (INWR) seeks to facilitate the development of wrestling around the world by drawing all wrestling sport science professionals together, in a manner that through our international and intercultural cooperation we are empowered to support the development of wrestling with our research and educational programs.

We have organized scientific meetings at the last 5 senior world wrestling championships and we were instrumental in working with United World Wrestling (UWW) in establishing the Scientific Commission.

The INWR sponsors the **Rayko Petrov Honor Lecture** memorializing the great Bulgarian wrestler, coach and prolific scholar. Each year the INWR names the person to be honored and that person delivers the memorial lecture at the INWR Annual Meeting. They are presented with the spectacular bronze trophy commissioned of Christo Christov by the Bulgarian Wrestling Federation. The **Young Researcher Award** is also presented to a researcher less than thirty years of age.



We publish the **International Journal of Wrestling Science** which is the only journal dedicated to the study of the world's oldest sport. The International Journal of Wrestling Science is a peer reviewed journal for professionals working in wrestling and wrestling sport science. Issues are published twice a year.



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2017 Wrestling Research Bibliography

- Ahmetov, I., Lutomski, P., Pospieszna, B., Jurasz, M., Wielinski, D., & Doberska, A. (2017). Genetic and environmental risk factors for lumbar disc disease in Olympic grappling athletes: a review. *Trends in Sport Sciences, 24*(1), 5-11.
- The authors examine genetic and environmental risk factors for lumbar disc disease in Olympic grappling athletes. The spine is the primary site of injuries in combat sports involving kicking, striking, throwing and joint locking. The execution of such techniques involves multiple repetitions of rapid movements, short maximal muscle contractions, usually with heavy external loads, and frequent training bouts with a partner. This type of training is associated with a significantly increased risk of injuries and overloads of the lumbar spine. The consequences of musculoskeletal overloads are often caused by the insufficient elasticity of the soft tissues.
- Aksoy, Y., Agaoglu, S. A. (2017). The comparison of sprint reaction time and anaerobic power of young football players, volleyball players and wrestlers. *Kinesiologia Slovenica, 23*(2), 5-14.
- This study was surveyed in order to compare and contrast the sprint, reaction time and anaerobic power of football players, volleyball players and wrestlers. The sportsmen were divided into 3 groups according to branches, and the rates of speed, reaction time and anaerobic strength of sportsmen have been measured. Identification of the differences of the groups in terms of statistical evaluation for reaction time and minimum power in sport branches has been indicated by Kruskal Wallis and Dunn's Multiple-Comparison test. On the other side, (one-way anova) and Tukey Multiple-Comparison test were used to indicate the differences among the branches in terms of sprint, peak power, average power and fatigue index. The measurements according to the branches are like below; reaction time 0.164 sec for footballers, 0.182 sec for volleyball players and 0.185 sec for wrestlers, Sprint time; 3.24 sec for footballers, 3.38 sec for volleyball players and 3.42 sec for wrestler; Peakpower; 278.51 watt for football players, 263.23 for volleyball players and 235.51 for wrestlers; Average power; 209.51 watt for footballers, 207.05 watt for volleyball players and 180.97 watt for wrestlers; Minimum power; 166.55 watt for football players, 163.29 watt for volleyball players and 143.22 watt for wrestlers; Fatigue index; 2.48 watt/sec for football players, 2.23 watt/sec for volleyball players and 1.99 watt/sec for wrestlers. It is found out that there are considerable differences ($P > 0.05$) in sprint, reaction time and anaerobic power values between football players and the other branches. As the trainings and matches of the football players mostly depend on leg-muscle strength and the leg-muscle strength is important for the measurements in the survey, football players' anaerobic power and sprint values are better than the other branches by considering the fact that reaction time is a part of speed.
- Alpay, C. B., & Isik, O. (2017). Comparison of body components and balance levels among hearing-impaired wrestlers and healthy wrestlers. *Acta Kinesiologica, 11*(1), 79-84.
- The purpose of this study is to compare the body components and static and dynamic balance levels of hearing-impaired wrestlers (H-IW) and healthy wrestlers (HW). Thirty-five H-IW and twenty-two HW participated in this research. The body components of the participating wrestlers were obtained by the Bioelectrical Impedance Analyzer (BIA), static and dynamic balance measurements via the Biodex Balance System, and back and leg strengths according to the protocols of back and leg dynamometry. The normality of data was tested by the Kolmogorov-Smirnov test. The independent Samples T Test was used to compare pair wise group variables that followed a normal distribution. Significance was accepted for values of $p < 0.05$ with a 95% confidence interval. No statistically significant difference was found among the values of H-IW and HW in terms of age, height, weight, Body Mass Index (BMI), sporting age, Percentage of Body Fat (PBF), Fat Mass (FM), Free Fat Mass (FFM). On the other hand, that there was a significant difference between back and leg strengths and static and dynamic balance levels among H-IW and HW. As a result, when H-IW and HW were compared, it was found that there was no difference between body components (PBF, FM and FFM) and demographic variables (age, height, weight, BMI, sport age) whereas HW had both higher average back and leg strengths and their dynamic and static balance levels were better than H-IW.
- Altungül, O. (2017). Branches Investigation of the Religious Beliefs in Various Terms of Variables of the Turkish National Team Athletes in Individual. *Journal of Education and Training Studies, 5*(4), 209-213.
- In general, and broadest sense, the word religion; "No matter what submission to a higher authority, to accept orders and provisions that arising from this authority as the rules that must be followed, when the prize comply with these rules will be taken when the penalty point against is the general name of a living system into believing the area. The study's population is the athletes participating in the competition in individual branches of the Turkish national team. The sample of the study is 50 females and 102 males totally 152 national athletes who representing Turkish National Team in individual branches such as Boxing (46), Taekwondo (30), Wrestling (76). Personal Information Survey and Religious Belief Scale were used in collecting the data. When the data analyzed statistically, it is determined that there is significant differences in terms of gender, marital status and level of education. As a result, it is emerged that, religious is known by everyone unheeded by someone but believed to be

in every respect and worshipping in availability by the elite athletes and in terms of sports and athletes it is different in normal people.

Aranson, M. V., Ozolin, E.S., Shustin, B.N. (2017). Nutrition and recovery of women in speed-strength and combat sports (foreign literature review) *Theory and Practice of Physical Culture*, 2017(2), 14-16.

In the present paper, we continue our analysis of the sports science development trends abroad. At this stage, we studied current issues of women's sports. The work was carried out within the framework of the public task of the Ministry of Sport of the Russian Federation.

Objective of the research was to carry out a scientific analysis of nutrition and recovery characteristics of women in speed and strength sports and identify priority trends of current research in the field abroad. Research methods and structure. Over a hundred papers on medical and biological aspects of female athletes' training in combat sports and similar kinds of activity were analyzed. The focus was on works that dealt with nutrition control in women's sports, along with the articles on recovery methods for female athletes. Results and discussion. It is known that eating disorders in sport are most common for women (the so-called "female athlete triad"). This condition is a significant risk factor for a variety of pathologies and increases the athlete's susceptibility to bone fractures.

Artioli, G. G., Saunders, B., Iglesias, R. T., & Franchini, E. (2017). Authors' Reply to Davis: "It is Time to Ban Rapid Weight Loss from Combat Sports". *Sports Medicine*, 47(8), 1677-1681. doi:10.1007/s40279-017-0715-1

Aydogan, A. (2017). Methods of weight reduction in elite wrestlers and their impact on the performance of athletes. *Leistungssport*, 47(6), 21-24.

170 Turkish and 135 German wrestlers took part in the survey. There were 104 Turkish champions, 55 European champions and 60 World champions among the 170 Turkish wrestlers. At the same time there were 8 wrestlers who had won an Olympic medal. And there were 65 German champions, 32 European champions and 28 World champions among the 135 German wrestlers. Additionally, 20 German wrestlers won an Olympic medal. With a survey of 29 question different pieces of information on the weight reduction of the wrestler were found out. The differences were checked after the following values. As a result of the survey we found out that 65,25% of the wrestlers lose weight (68,82% of the Turkish and 60,74% of the German) before a match. Among the Turkish participants the number of wrestlers who lose 5-6 kilos of weight is very high. Among the German wrestlers the maximum weight reduction lies between 4-5 kilos. A large part of the wrestlers loses weight with personal methods. Again 33,77% of the German and Turkish wrestlers stated that they start losing weight 7-9 days in advance of a match. Another aspect of weight reduction before matches is that 26,23% of the wrestlers lose weight by changing their diet or by exercising more intensively. 41,3% of participants stated that wrestlers had to lose weight in order to be successful in the match.

Bakonska-Pacon, E., Dziubek, W., Forgiel, G., Murawska-Cialowicz, E., Zaton, M., & Witkowski, K. (2017). Effects of gradual weight loss on anaerobic capacity and muscle strength in elite taekwondo ITF athletes. *Archives of Budo*, 13, 117-130.

Background & Study Aim: Intentional reduction of body weight is a well-known and common practice among athletes, especially in weight category sports. The aim of this study was the effects of a 6-week gradual weight loss (GWL) program on anaerobic capacity, body composition and muscle strength of taekwondo athletes. Material & Methods: The study included 9 men and 9 women practicing taekwondo ITF athletes (proficiency second dan). The following indicators were determined during the anaerobic capacity test: maximum power Pmax (W; W·kg⁻¹), time to maximum power t(Pmax) (s), time of maintenance power tmP (s), total work Wtot (J · kg⁻¹) and fatigue index % FI. The list of determined body composition indicators included: relative content of fatty tissue (% FAT), lean body mass (LBM) and total body water (TBW). Moreover, we calculated body mass index BMI (kg·m⁻²) of the athletes. Concentration of lactate was determined in the arterialized blood from the finger pulp, obtained immediately prior to the warm-up and proper Wingate test, as well as 3 minutes post-exercise. Blood lactate concentration (La) was determined enzymatically using a LP400 Photometer (Dr Lange, Germany). Results: After GWL, both men and women showed a significant decrease in body weight (p<0.05). Also the relative content of fatty tissue (% FAT) decreased significantly (p<0.05) in both men and women, by 2.99% and 1.69% on average, respectively. GWL resulted in changes in the analyzed indicators of anaerobic capacity. Maximum power (W) decreased significantly (p<0.05), by 82.10 and 11.78 in men and women, respectively. Following the GWL program, both women and men presented with significantly lower values of the peak torque and average power in dominant limbs tested at both angular velocities. However, the decrease in these indicators did not correlated significantly with maximum power determined during a Wingate test. Conclusions: The GWL programs may exert beneficial effects as a method of weight control in taekwondo athletes if followed by an individualized control of training effects. Changes in body weight and composition, including a decrease in BMI, did not alter significantly the indices of anaerobic capacity.

Barbas, I., Giannakou, E., Aggeloussis, N., Gourgoulis, V. (2017). *3D DUTH wrestling dummy and training*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad, Serbia.

The purpose of the training partner 3D DUTH wrestling dummy is to allow wrestling athletes to train at full speed and full contact, to improve their technique along with their specific wrestling power and speed. Using this dummy many head snapping technical holds and head snap set-ups, used to attack the legs, can be perfected without the risk of injury. At the same time significant data of technical applications are recorded in a database and compared with a previous training session in order to improve the configuration of the training program. The 3D DUTH wrestling dummy is made of durable and flexible materials and has Wi-Fi and Bluetooth connectivity, a point-of-view camera, auditory stimulus, 6 visual stimuli sensors, 11 pressure sensors and 4 accelerometers which can wirelessly send data to a computer. With the measurement of the kinematic parameters and the help of an analysis system, the motion curves (graphs) that describe the motion of the individual parts of the body and especially the legs can be derived during the whole training session, using the 3D DUTH wrestling dummy, the athlete's most valuable partner.

Barkov, A. Y. (2017). Securing university wrestlers' technical and tactical progress based on competitive performance quality rating data. *Theory and Practice of Physical Culture*, 2017(1), 53-55.

The study gives an overview of National Research Moscow State University of Civil Engineering (NRMSUCE) picked freestyle wrestlers' technical and tactical progress (TTP) rating methodology based on the competitive performance rating data and analyses of the NRMSUCE athletes versus those of the top-ranking competitors in the Moscow Student's Sport Games (MSSG) for the period of 2013-15. The study data and analyses gave the means to offer the following practical recommendations to the university wrestlers: - Focus on the holds and inside-distance wins, i.e. cut down the average fight time; - Expand the range of attacking actions to step up the average individual score to 30-35 points; - Excel the quality of holds and completed techniques to the best possible level.

Barley, O. R., Chapman, D. W., & Abbiss, C. R. (2017). Weight Loss Strategies in Combat Sports and Concerning Habits in Mixed Martial Arts. *International journal of sports physiology and performance*, 1-24. doi:10.1123/ijsp.2017-0715

PURPOSE: Combat sports are typically divided into weight classes and body mass manipulation to reach a weight class is commonplace. Previous research suggests that mixed martial arts (MMA) weight loss practices may be more extreme than other combat sports. We sought to investigate the magnitude of weight lost and prevalence of weight loss strategies in different combat sports.; METHODS: Competitors (n=637) from Brazilian jiu jitsu (BJJ), boxing, judo, MMA, Muay Thai/kickboxing (MT/K), taekwondo (TKD) and wrestling completed an online questionnaire seeking information regarding their weight loss practices.; RESULTS: Body mass manipulation was commonly undertaken by all combat sports athletes, with a particularly high incidence of gradual dieting, increased exercise and fluid restriction. Skipping meals was higher in TKD and wrestling (84%) compared with the other combat sports (~58%), whilst training in heated rooms and forced oral fluid loss (spitting) was higher in wrestling (83% and 47%, respectively) compared with other combat sports (~45% and ~19%, respectively). MMA athletes reported the highest usage of sauna (76%) and water loading (67%) whilst also reporting the second highest use of training in rubber/plastic suits (63%).; CONCLUSIONS: Body mass manipulation was present in all combat sports with the prevalence and magnitude of acute weight loss greater in MMA. The incidence of and practices reported will assist support staff to be fully aware of the variety of methods these athletes and coaches may use to achieve weight loss. Additionally, the results could aid regulatory bodies in the further development of policies on weight cutting.

Baum, R. M. (2017). Wrestlers on the Awasena Path: Wrestling, Fertility, and Rites of Passage among the Diola of Southern Senegal. *Numen: International Review for the History of Religions*, 64(4), 418-433. doi:10.1163/15685276-12341473

The existing literature on religion and sport focuses on the ways that sporting events take on many aspects of religious events, fostering a sense of community and reinforcing a sense of opposition to external groups. This article focuses on a different aspect, the use of ritual to reduce the uncertainties of athletic competition in wrestling matches and its role in socializing boys and girls into the religious obligations that they will assume as adults. Utilizing a case study from the southern Diola of the Casamance area of Senegal, it builds on the author's participation in wrestling rituals to analyze the ways in which rituals surrounding wrestling matches socialize boys and girls into ritual life, while providing individual wrestlers with a sense of protection against spiritual attacks and the uncertainties of individual competitions.

Bayraktar, I. (2017). Agility and Speed Standards for Student Teenager Wrestlers. *Universal Journal of Educational Research*, 5(4), 557-560.

The processes of talent identification and development provide serious advantages to success of athletes. The interpretation of the current situation in the process of the athletes' education gets more worth through the use of objective assessment, in other words using norm values. The observation of the talent by norms is important for each sport event like it is for wrestling. The purpose of this study is to determine the normative values of speed and agility ability for student wrestlers. The research group is a group of 480 male student wrestlers between 13-16 years old. The linear speed ability of the group is identified for 13 year olds is $3,576 \pm 0,239$ sec., for 14 years is $3,422 \pm 0,197$ sec., for 15 years is $3,316 \pm 0,195$ sec. and for 16 years is $3,22 \pm 0,166$ sec. Agility ability of the students is found out for 13 years is $5,701 \pm 0,399$ sec., for 14 years is $5,487 \pm 0,391$ sec., for 15 years is $5,399 \pm 0,439$ sec. and for 16 years is $5,303 \pm 0,346$ sec. Coaches will have the opportunity to determine objectively the level of

their athletes according to their ages because of this study is standardizing speed and agility abilities of student wrestlers as 10% of slices.

Boden, B. P., Pierpoint, L. A., Boden, R. G., Comstock, R. D., & Kerr, Z. Y. (2017). Eye Injuries in High School and Collegiate Athletes. *Sports Health: A Multidisciplinary Approach*, 9(5), 444-449.

Although eye injuries constitute a small percentage of high school and college sports injuries, they have the potential to be permanently debilitating. Hypothesis: Eye injury rates will vary by sport, sex, and between the high school and college age groups. Study Design: Descriptive epidemiology study. Level of Evidence: Level 3. Methods: Data from eye injury reports in high school and college athletes were obtained from the National High School Sports-Related Injury Surveillance System, High School Reporting Information Online (HS RIO) database over a 10-year span (2005-2006 through 2014-2015 school years) and the National Collegiate Athletic Association (NCAA) Injury Surveillance Program (ISP) over an 11-year span (2004-2005 through 2014-2015 school years). Injury rates per 100,000 athlete-exposures (AEs), injury rate ratios (RRs), and 95% CIs were calculated. Distributions of eye injuries by diagnosis, mechanism, time loss, and surgery needs were also examined. Results: A total of 237 and 273 eye injuries were reported in the HS RIO and the NCAA ISP databases, respectively. The sports with the highest eye injury rates (per 100,000 AEs) for combined high school and college athletes were women's basketball (2.36), women's field hockey (2.35), men's basketball (2.31), and **men's wrestling** (2.07). Overall eye injury rates at the high school and college levels were 0.68 and 1.84 per 100,000 AEs, respectively. Eye injury rates were higher in competition than practice in high school (RR, 3.47; 95% CI, 2.69-4.48) and college (RR, 3.13; 95% CI, 2.45-3.99). Most injuries were contusions (high school, 35.9%; college, 33.3%) and due to contact (high school, 89.9%; college, 86.4%). Only a small percentage of injuries resulted in time loss over 21 days (high school, 4.2%; college, 3.0%). Conclusion: Eye injury rates and patterns vary by sport, sex, and between the high school and college age groups. Although severe injuries do occur, most eye injuries sustained by high school and college athletes are minor, with limited time loss and full recovery. Clinical Relevance: Additional focus needs to be placed on preventing eye injuries at the collegiate level in women's and men's basketball, women's field hockey, and men's wrestling.

Broennle, M., Kivi, D., Zerpa, C. (2017). Maximal static and dynamic neck strength in hockey players and wrestlers. *International Journal of Sports Science*, 7(3), 111-117.

The purpose of this study was to compare maximal static and dynamic neck strength between hockey players and wrestlers. Athletes were recruited from the university men's hockey and wrestling teams, with active male university students serving as a control group. Each group consisted of eight participants between the ages of eighteen and twenty-four. Anthropometric measurements, including height, mass, neck length, and neck girth were taken prior to testing. Static and dynamic cervical strength testing was completed using a modified Nautilus neck strengthening machine. Maximal static neck flexion and extension strength were measured using a load cell attached to the arm of the Nautilus machine, which was set in a neutral neck position. To measure dynamic neck strength, a 6-Repetition Max (RM) submaximal test was completed for cervical flexion and extension, from which 1-RM values were predicted. Mean normalized strength values were significantly higher among all participants for neck extension (M = .32, SD = .12) than for neck flexion (M = .20, SD = .07). Mean neck strength was significantly greater for dynamic muscle contractions (M = .31, SD = .13) than for static muscle contractions (M = .22, SD = .08). When comparing among groups, mean normalized static neck strength of the wrestlers was significantly greater than that of the hockey players in both the flexion and extension directions, with no differences seen between the hockey players and the controls. Differences in static and dynamic neck strength between hockey players and wrestlers are likely associated with the demands of each sport and their sport-specific strength training.

Bromley, S. J., Drew, M. K., Talpey, S., McIntosh, A. S., & Finch, C. F. (2017). A systematic review of prospective epidemiological research into injury and illness in Olympic combat sport. *British Journal of Sports Medicine*. doi:10.1136/bjsports-2016-097313
BACKGROUND: Combat sports involve body contact through striking, kicking and/or throwing. They are anecdotally referred to as 'dangerous', yet long-term investigation into specific injury rates is yet to be explored. OBJECTIVE: To describe incidence and prevalence of injury and illness within Olympic combat sports and to investigate risk of bias of prospective injury and illness research within these sports. METHODS: We systematically searched literature published up until May 2016. We included prospective studies of injury/illness in elite combat athletes lasting more than 12 weeks. Risk of bias was assessed using a modified version of the Downs and Black checklist for methodological quality. Included studies were mapped to the Oxford Centre for Evidence-Based Medicine levels of evidence. RESULTS: Nine studies were included, and most (n=6) had moderate risk of bias. Studies provided level 1/2b evidence that the most frequently injured areas were the head/face (45.8%), wrist (12.0%) and lower back (7.8%) in boxing; the lower back (10.9%), shoulder (10.2%) and knee (9.7%) in judo; the fingers (22.8%) and thigh (9.1%) in taekwondo; and the knee (24.8%), shoulder (17.8%) and head/face (16.6%) in wrestling. Heterogeneity of injury severity classifications and inconsistencies in exposure measures prevented any direct comparisons of injury severity/incidence across combat sports. CONCLUSIONS: There is currently a lack of consensus in the collection of injury/illness data, limiting the development of prevention programmes for combat sport as a whole. However, sport-specific data that identify body areas with high injury frequency can provide direction to clinicians, enabling them to focus their attention on developing pathologies in these areas. In doing so, clinicians can enhance the practical elements of their role within the integrated combat sport performance team and assist in the regular update of surveillance records.

- Burdukiewicz, A., Pietraszewska, J., Stachon, A., & Andrzejewska, J. (2017). Anthropometric profile of combat athletes via multivariate analysis. *The Journal of sports medicine and physical fitness*. doi:10.23736/s0022-4707.17.07999-3
- BACKGROUND: Athletic success is a complex phenotype influenced by multiple factors, from sport-specific skills to anthropometric characteristics. Considering the latter, the literature has repeatedly indicated that athletes possess distinct physical characteristics depending on the practiced discipline. The aim of the present study was to apply univariate and multivariate methods to assess a wide range of morphometric and somatotypic characteristics in male combat athletes.; METHODS: Biometric data were obtained from 206 male university-level practitioners of judo, jiu-jitsu, karate, kickboxing, taekwondo, and wrestling. Measures included height- and length-based variables, breadths, circumferences, and skinfolds. Body proportions and somatotype, using Sheldon's method of somatotomy as modified by Heath and Carter, were then determined. Body fat percentage was assessed by bioelectrical impedance analysis using tetrapolar hand-to-foot electrodes. Data were subjected to a wide array of statistical analysis.; RESULTS: The results show between-group differences in the magnitudes of the analyzed characteristics. While mesomorphy was the dominant component of each group somatotype, enhanced ectomorphy was observed in those disciplines that require a high level of agility. Principal component analysis reduced the multivariate dimensionality of the data to three components (characterizing body size, height-based measures, and the anthropometric structure of the upper extremities) that explained the majority of data variance.; CONCLUSIONS: The development of a sport-specific anthropometric profile via height- and mass-based and morphometric and somatotypic variables can aid in the design of training protocols and the identification of athlete markers as well as serve as a diagnostic criterion in predicting combat athlete performance.
- Byrd, J. W. T., Clohisy, J. C., Kim, Y.-J., Gwathmey, F. W., Jones, K. S., & Millis, M. B. (2017). Hip dysplasia in wrestlers: three lessons learned. *Journal of hip preservation surgery*, 4(4), 332-336. doi:10.1093/jhps/hnx028
- Hip problems due to dysplasia are commonly associated with female athletes in sports demanding supraphysiologic motion, such as ballet, gymnastics and figure skating. However, hip problems are rarely mentioned among wrestlers, a male sport in which flexibility is advantageous. Dysplasia may have a mostly unrecognized prevalence among wrestlers that can lead to problems and benefit from reorientation periacetabular osteotomy (PAO). Study design in this research is Level 4 evidence case reports. Three consecutive intercollegiate wrestlers ages 20, 21 and 22years underwent PAO for dysplasia and are reported. Two underwent concomitant arthroscopy. Each returned successfully to intercollegiate wrestling at 6, 8 and 11months. There were no complications. This work concludes that dysplasia has an unknown but mostly unrecognized prevalence among wrestlers. With proper recognition and treatment with PAO, there is a reasonable expectation that they could return to wrestling.
- Cae Rodrigues, A. I., Baião Junior, A. A., Moreira Antunes, M., & de Almeida, J. J. G. (2017). Percepção dos dirigentes das escolas do município de jaguariúna sobre as lutas. *The perception of school directors in the city of jaguariúna about combat sports.*, 28(1), 1-14. doi:10.4025/jphyseduc.v28i1.2809
- The objective of this study is to understand the perceptions of elementary school leaders in the municipality of Jaguariúna (State of São Paulo, Brazil) about the benefits that combat sports can bring to education in Physical Education classes or as extracurricular activities and the possibilities to enabling this process. Semi-structured interviews were conducted with school directors and coordinators in all 15 public and private schools, totaling 30 interviews. Most of the interviewed had little contact with combat sports and only three had this activity at the school. The interviews were recorded, transcribed, and organized for qualitative textual analysis. The results point out that combat sports are valuable teaching tools in elementary schools, and that in order for their benefits to be achieved, they should be developed following school regular activities, and the professionals must be inserted in the school context. Several benefits were emphasized by the school leaders, including aspects of student attitudes, transmission of values, emotional development, social relations and benefits related to physical activity.
- Canuzakov, K., Demirhan, B., Sukrab Uulu, N., & Geri, S. (2017). Investigation of regional strength of kirgiz greco-roman and freestyle national team wrestlers. / kirgiz greko-romen ve serbest milli güreşçilerin bölgesel kuvvetlerinin incelenmesi. *Journal of Physical Education & Sports Science / Beden Eğitimi ve Spor Bilimleri Dergisi*, 11(1), 20-27.
- The aim of this study is to determine body fat ratio (BFR), body mass indexes (BMI) and regional strength differences of Greco-Roman and freestyle wrestlers in Kyrgyzstan national team. 20 Greco-roman wrestlers participated in the study with mean age of $25,00 \pm 5,83$ (years), height length of $175,45 \pm 6,80$ (cm) and body weights of $73,15 \pm 17,21$ (kg), while 20 freestyle wrestlers participated in the study with mean age of $21,50 \pm 3,05$ (years) height length of $175,20 \pm 8,34$ (cm) and body weight of $79,50 \pm 19,65$ (kg). The measurements of the claw strength of the subjects were made by using a Takkei brand hand dynamometer and their back and leg strength made by using a Takkei brand back and leg dynamometer. The body fat ratios have been determined in accordance with the HOLTAIN brand skinfold caliper and according to LANGE formula. Expressions such as SPSS 15.00 package program, mean, standard deviation, percentage and t test have been used in the analysis of the data. Significance level has been determined as ($p < 0.05$) in statistical calculations. As a result, it has been found that the average of Greco-Roman style wrestlers' back strength was significantly higher than that of Freestyle wrestlers' ($P < 0.05$). According to wrestling style difference, there was no statistically difference between paw strengths and body fat ratios and body mass

indexes ($P > 0,05$). The values of Greco-roman style wrestlers' leg strength were higher than Freestyle wrestlers', but this difference was not statistically significant ($P > 0,05$).

Capranica, L., Condello, G., Tornello, F., Iona, T., Chiodo, S., Valenzano, A., . . . Cibelli, G. (2017). Salivary alpha-amylase, salivary cortisol, and anxiety during a youth taekwondo championship an observational study. *Medicine*, 96(28). doi:10.1097/md.00000000000007272

The aim of this study was to assess the stress-related responses and the coach's capability to match perceived efforts of youth athletes during a taekwondo championship. Using a cross-sectional study design, salivary cortisol (sC) and alpha-amylase (sAA) were measured in 6 males and 3 females young (11.0 ± 0.9 years) athletes at awakening, 5 minutes before, and 1 minute and 30 minutes after official combats. State anxiety was recorded 60 minutes before the first competition, whereas coach's and athletes' ratings of perceived exertion (RPE) were obtained at the end of the combats. Time-matched (awakening and pre-competition) salivary samples and trait anxiety were collected 7-day postcompetition during a resting day. No effect for match outcome emerged. No difference emerged between athletes and coach RPEs. Higher ($P = .03$) state anxiety (41.6 ± 10.9 points) was shown than trait anxiety (34.8 ± 7.1 points). Time-matched sAA were similar. Peak sAA observed at the end of the combat (114.2 ± 108.1 U/mL) was higher ($P < .01$) than the other samples (range: 20.6-48.1 U/mL), whereas sC increased ($P < .05$) from awakening (8.0 ± 1.5 nmol/L), with peak levels observed at 30 minutes into the recovery phase (19.3 ± 4.3 nmol/L). Furthermore, pre-competition sC (16.5 ± 4.5 nmol/L) values were higher ($P < .01$) with respect to time-matched samples during the resting day (4.6 ± 1.0 nmol/L). The 3 athletes engaged in consecutive matches showed a tendency toward increasing sAA and sC. Taekwondo combats pose a high stress on young athletes, eliciting a fast reactivity of the sympathetic-adrenomedullary system relative to the hypothalamic-pituitary-adrenocortical system. Understanding the athlete's efforts during combats, coaches are recommended to apply effective recovery strategies between matches.

Carl, M. (2017). Der Einfluss von Regeländerungen auf das Technikprofil im Ringen im griechisch-römischen Stil (The influence of rule changes on the technique profile in Greco-Roman style wrestling) *Heft 2017* (pp. 17-23). Norderstedt, Germany: Norderstedt Books on Demand.

Aufgrund neuer Regeländerungen sowie der Forderung des IOC. Ringen wieder attraktiver zu gestalten, wirken sich Regeländerungen auch immer auf das Technik-Wettkampfprofil der einzelnen Athleten aus. Da die Athleten immer ihr eigenes Technik- Wettkampfprofil dem Schwerpunkt der Regeländerungen anpassen. Vor diesem Hintergrund soll in der Studienarbeit eine Analyse von ausgewählten Spitzenathleten erfolgen, in der Analyse wird untersucht, inwieweit sich die Änderung der Weltkampfgeltn auf die Technik-Wettkampfprofile von internationalen Spitzenathleten im griechisch-römischen Stil ausgewirkt hat. Es wird vermutet, dass sich internationale Spitzenringer sehr schnell an Regeländerungen anpassen und ihr individuelles Technik-Taktik-Profil) dementsprechend verändern bzw variieren können. Die Protokollierung der Wettkämpfe erfolgt über die Kategorisierung der Angriffstechniken im Stand- und Bodenringen nach einem vom Deutschen Ringerbund e.V. (DRB) neu entwickelten Ordnungssystem (Ruch et al. 2014). Mit der Analyse werden Rückschlüsse auf das Techniktraining im Trainingsprozess der Nationalmannschaft Ringen griechisch-römischer Stil im Hinblick auf die Vorbereitung der Athleten auf die Olympischen Sommerspiele 2016 in Rio de Janeiro gezogen.

Carl, R. L., Johnson, M. D., & Martin, T. J. (2017). Promotion of Healthy Weight-Control Practices in Young Athletes. *Pediatrics*, 140(3), 1-13. doi:10.1542/peds.2017-1871

Children and adolescents may participate in sports that favor a particular body type. Some sports, such as gymnastics, dance, and distance running, emphasize a slim or lean physique for aesthetic or performance reasons. Participants in weight-class sports, such as wrestling and martial arts, may attempt weight loss so they can compete at a lower weight class. Other sports, such as football and bodybuilding, highlight a muscular physique; young athletes engaged in these sports may desire to gain weight and muscle mass. This clinical report describes unhealthy methods of weight loss and gain as well as policies and approaches used to curb these practices. The report also reviews healthy strategies for weight loss and weight gain and provides recommendations for pediatricians on how to promote healthy weight control in young athletes.

Casals, C., Lopez-Gullon, J. M., Trivic, T., Drid, P. (2017). *Somatotypes and anthropometric profile of elite Serbian Greco-Roman wrestlers*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad, Serbia.

The aim of this study was to compare the anthropometric profile of elite Greco-Roman wrestlers by their body mass. Somatotypes of 32 Serbian wrestlers were determined according to the Heath-Carter method, being balanced-mesomorphic in lighter athletes and mesomorph-endomorphic in heavier ones; statistically significant for endomorphy ($r = -0.70$, $p < 0.001$), mesomorphy ($r = -0.68$, $p < 0.001$), and ectomorphy ($r = 0.79$, $p < 0.001$). Body fat percentage was calculated as: ($6 \text{ skinfolds} \times 0.1051$) + 2.58, including triceps, subscapular, suprascapular, abdomen, thigh, and medial calf skinfolds; showing similar percentages in light and middle-weight categories, while heavier athletes presented higher body fat percentages ($r = 0.73$, $p < 0.001$). Therefore, weight-specific characteristics in body composition was reported in elite Greco-Roman wrestlers.

Chaabene, H., Negra, Y., Bouguezzi, R., Mkaouer, B., Franchini, E., Julio, U., & Hachana, Y. (2017). PHYSICAL AND PHYSIOLOGICAL ATTRIBUTES OF WRESTLERS: AN UPDATE. *Journal of Strength & Conditioning Research (Lippincott Williams & Wilkins)*, 31(5), 1411-1442.

Wrestling is one of the oldest combat sports, disputed since the ancient Greek Olympic Games. This combat sport discipline has caught the attention of scientists since 1943 which is the date that matches the appearance of the first scientific research dealing with wrestling. The current short review aimed to summarize and critically analyze the scientific literature related to wrestling's physical and physiological attributes and to provide practical recommendations for testing/training together with new perspective and areas of future scientific research. Regardless of sex and wrestling styles, an optimal level of cardiorespiratory fitness is important to help sustaining effort throughout the duration of the match and to stimulate the recovery process between periods. With regard to the anaerobic power and capacity, the available studies were in agreement about their critical importance toward reaching high-level wrestling success since these variables have discriminated well between successful and less-successful wrestlers regardless of age, weight classes, and wrestling styles. Physical fitness parameters such as maximal dynamic strength, isometric strength, explosive strength, and strength endurance are closely related to high-level wrestling performance. However, flexibility level seems not to be one of the key fitness variables that help to reach high-level wrestling success. Overall, to achieve high-level wrestling performance, training should be directed to develop anaerobic power and capacity, aerobic power, maximal dynamic and isometric strength, explosive strength, and strength endurance.

Channon, A. & Matthews, C.R. (Eds.) (2017). *Global Perspectives on Women in Combat Sports: Women Warriors around the World*. London, UK: Palgrave Macmillan, 2015, 322 p.

Chen, W.-Y., Wu, S. K., Song, T.-F., Chou, K.-M., Wang, K.-Y., Chang, Y.-C., & Goodbourn, P. T. (2017). Perceptual and motor performance of combat-sport athletes differs according to specific demands of the discipline. *Perceptual and Motor Skills*, 124(1), 293-313. doi:10.1177/0031512516681342

The specific demands of a combat-sport discipline may be reflected in the perceptual-motor performance of its athletes. Taekwondo, which emphasizes kicking, might require faster perceptual processing to compensate for longer latencies to initiate lower-limb movements and to give rapid visual feedback for dynamic postural control, while Karate, which emphasizes both striking with the hands and kicking, might require exceptional eye-hand coordination and fast perceptual processing. In samples of 38 Taekwondo athletes (16 females, 22 males; mean age = 19.9 years, SD = 1.2), 24 Karate athletes (9 females, 15 males; mean age = 18.9 years, SD = 0.9), and 35 Nonathletes (20 females, 15 males; mean age = 20.6 years, SD = 1.5), we measured eye-hand coordination with the Finger-Nose-Finger task, and both perceptual-processing speed and attentional control with the Covert Orienting of Visual Attention (COVAT) task. Eye-hand coordination was significantly better for Karate athletes than for Taekwondo athletes and Nonathletes, but reaction times for the upper extremities in the COVAT task—indicative of perceptual-processing speed—were faster for Taekwondo athletes than for Karate athletes and Nonathletes. In addition, we found no significant difference among groups in attentional control, as indexed by the reaction-time cost of an invalid cue in the COVAT task. The results suggest that athletes in different combat sports exhibit distinct profiles of perceptual-motor performance.

Choi, D., & 장유진. (2017). The life of the First Korean Gold Medalist of World Amateur Wrestling Championship, 'Jang Chang-Sun'. [대한민국 최초의 세계아마추어레슬링선수권대회 금메달리스트 '장창선' 선수 시절의 삶]. *Korean Society for the Study of Physical Education*, 22(2), 53-70. doi:10.15831/jksspe.2017.22.2.53

Purpose: This study's goal is searching the life and the educational meaning of the first Korean Wrestling Gold Medalist of World Championship, 'Jang Chang-Sun.' Methods: The materials are collected by interviews and documented data. The collected materials are analyzed by using the method of holistic-content approach of Lieblich, Tuval-Mashiach & Zilber (1998). To guarantee the credibility of materials, member checking, peer debriefing and triangulation are carried out. Results: Firstly, in the 'A poor boy becomes a wrestling player(1941~1960)', a poor boy, separated from his family, found manly wrestling that have nothing to do with money, and soon 'the wrestling' became the only motive of his life. Secondly, in the 'To promote South Korea by conquering the world (1961~1966)', he got silver medal for the first time in the Korean wrestling history, at the 4th Asian Game held in Jakarta, Indonesia in 1962, which was the first international competition that he participated in and he tried to go much higher and wider. At 1964 Tokyo Olympic Games, he got silver medal for the first time in the Korean wrestling history. At 1966 Toledo World Championships, conquering the world, he got 'the long-awaited gold medal' for the first time in the Korean history so that Korean national anthem was resonated all over the world. Conclusion: Jang Chang-Sun was the legend of Korean wrestling and a true hero among the sports hero, who showed that one could someday achieve the dream if he constantly challenged to his dream and hope.

Chorney, S. R., Sobin, L., Goyal, P., & Suryadevara, A. C. (2017). Maxillofacial injuries among National Collegiate Athletic Association athletes: 2004-2014. *Laryngoscope*, 127(6), 1296-1301. doi:10.1002/lary.26441

Objective: Participation in National Collegiate Athletic Association (NCAA) sports increases annually, yet the risk of maxillofacial injuries among these athletes is unknown. We report the incidence and trends in maxillofacial injuries among NCAA athletes.

Study Design: Retrospective study of the NCAA Injury Surveillance System (ISS) representing athletes from seven men's and eight women's sports across Divisions 1, 2, and 3. Incidence of maxillofacial injuries by sport, gender, anatomic location, and injuries requiring surgery were measured. Methods: Athlete exposure data from 2004 to 2005 through 2013 to 2014 were analyzed, along with maxillofacial injuries recorded in the NCAA-ISS. Results: There were 2,017 injuries recorded, which projects to 41,204 injuries from 202,087,229 athlete events, or 2.04 injuries per 10,000 athlete events (95% confidence interval [CI], 1.68 to 2.40). Women had higher injury rates, 2.06 versus 2.03 ($P = 0.016$ [95% CI 0.22 to 2.09]). Highest rates were noted in men's wrestling 7.02 (95% CI, 2.84 to 11.19) and men's basketball 4.80 (95% CI, 3.57 to 6.02), and were lowest in women's ice hockey 0.61 (95% CI, 0.17 to 1.06) and women's volleyball 0.43 (95% CI, 0.20 to 0.66). No gender differences in fractures or need for surgery, but men sustained more operative fractures, 27.85% versus 17.04% ($P = 0.035$ [95% CI, 0.79 to 20.82]). Men's football, women's ice hockey, women's volleyball, and women's gymnastics had consistently low fracture rates. Conclusion: Maxillofacial injuries represent approximately 3.4% of all injuries sustained by NCAA athletes. Women had a higher injury rate, whereas men had a higher rate of operative facial fractures. Awareness and improved facial protection, especially among noncontact sports, will be crucial in reducing the incidence of these injuries. Level of Evidence: 4. Laryngoscope, 127:1296-1301, 2017.

Cicioglu, H. I., Isik, O., Yildirim, I., Unveren, A., & Karagoz, S. (2017). The effects of dehydration before competition upon body compositions, leptin hormone and ghrelin hormone among elite wrestlers. *Biomedical Research (0970-938X)*, 28(10), 4335-4341.

The aim of the study was to determine the changes in body compositions and hydration levels before a competition among elite wrestlers and to demonstrate the difference among leptin and ghrelin hormone levels due to dehydration. Pre and post-test measurements were performed among the twenty-four voluntary wrestlers in before an international tournament. A personal information form that addressed pre-competition weight loss duration and demographic variables was administered to the participant wrestlers. Additionally, body compositions were analyzed using BIA (Bioelectric Impedance Analyzer), and with the help of specialists, 5 cc of blood was drawn from the forearm veins of the wrestlers. Sodium (Na^+), Blood Urea Nitrogen (BUN), glucose, leptin and ghrelin levels were analyzed in the blood samples. The wrestlers' Plasma osmolarity (POsm) levels were calculated through Na^+ , BUN and glucose in a mathematical formula. The wrestlers who had $\text{POsm} > 290$ mOsm/L constituted the weight loss group while the wrestlers who had $\text{POsm} \leq 290$ mOsm/L constituted the non-weight loss group. It was identified that all the body composition variables of weight loss group were different both in the pre-test and posttest. Furthermore, BUN, glucose, POsm and ghrelin hormone levels of the weight loss group were different whereas there were no differences in sodium and leptin levels. As a result, it was found that wrestlers who lost weight before a competition did it quickly; therefore, wrestlers who underwent significant changes in their body compositions demonstrated serious increases in POsm and ghrelin hormone levels.

Cimic, S., Luksic, I., Luznik, Z., & Kopic, M. (2017). Awareness of Dental Trauma Management At Combat Sport. *Research Journal of Pharmaceutical Biological and Chemical Sciences*, 8(4), 469-473.

The purpose of this study was to investigate awareness of possible tooth replantation after avulsion and awareness of optimal time for tooth replantation at different combat sports. Study included 56 participants (average 26,7 +/- 9,3 years). All responses were collected with anonymous electronic survey which was sent to different combat sports clubs in Croatia. Survey recorded type of combat sport, past dental traumas, loss of consciousness, awareness of possible tooth replantation and awareness of optimal period for replantation. 42 participants (75,0 %) did not experience dental trauma. Two participants (3,6%) had tooth avulsion, 11 (19,6 %) tooth fracture and 1 participant (1,8 %) had tooth dislocation. Eleven participants (19,6 %) experienced loss of consciousness during sparing of fight. Twenty-eight participants (50 %) responded negatively on question, "Do You know that avulsed tooth can be replanted". Nine participants (16,1 %) new optimal time for tooth replantation. Combat sports fighters showed low level of knowledge about tooth avulsion and replantation, and low level of knowledge about optimal time for tooth replantation. It is necessary to provide knowledge about dental traumas and dental trauma management information to all combat sports participants, especially fighters.

Curby, D. G. (2017). *Considerations in the Establishment of Weight Classes for Wrestling*. Paper presented at The International Scientific And Professional Conference On Wrestling "Applicable Research in Wrestling", Novi Sad.

The decision by the international governing body for wrestling, United World Wrestling (UWW) to reorganize its weight classes, along with an increase to 10 classes for competition in non-Olympic years, provides the sport with a wonderful opportunity to create an approach that is rational, based on scientific knowledge and creates more opportunities for participation. We now have a blank slate, and while no set of weight classes can be perfect, one should be able to explain the basis for its formulation. This paper will review the history of weight classes in the sport, and attempt to put forth a rationale means for the establishment of a weight class model in the future, and also to provide an example of such a process.

Cynarski, W. J. (2017). Towards a General Theory of Fighting Arts. *Physical Activity Review*, 5, 83-90. doi:10.16926/par.2017.05.12

Introduction: The fighting arts are an interesting area for researchers from many scientific disciplines around the world. Scientific investigations need to choose appropriate theory, language and methods. The first theory that gives us a special language is the Humanistic Theory of Martial Arts, HTMA. The second is the Anthropology of Martial Arts, AMA. The problem

considered in this study is how we should study the martial arts & combat sports & systems, or 'combatives'; what theoretical framework should we use. It is the author's proposal for a scientific perspective which should be useful; an elaboration the Humanistic Theory of Martial Arts (HTMA) and definitions, the General Theory of Fighting Arts (GTFA), and the Anthropology of Martial Arts. Methodology: Participant observation, and qualitative content analysis of the literature were used. Methodology of research (in the area of the fighting arts) was also analyzed. Results and Discussion: General Theory of Fighting Arts GTFA. In the GTFA we can study and explain a broad area of fighting arts and the related problems. These are: 1. Cultural areas of martial arts & combat sports & combat systems (according to AMA and HTMA); 2. Teaching concepts (technical and tactical issues), combat strategy (for self-defence and in combat sports), aspects of real fighting interdisciplinary; 3. Bio-technical issues from the perspective of sports sciences. The Research methodology for traditional East Asian martial arts requires its own practice and a high level of sophistication at best, in more than one martial art. It is a qualitative method of participant observation associated with the experience of metaphysical dimensions. This special method is the 'shugyo' (Jap. shugyo) psychophysical study and experience from practicing psycho-physical systems. Michael Maliszewski was one of first researchers using this method. Conclusion: The GTFA is the sum of HTMA (humanistic, social and cultural issues), AMA (philosophical, cultural and biological approaches), and a part of Sport Sciences, for coaching, bio-technical and bio-medical issues, the methodology of teaching, etc. The GTFA now created should give us the opportunity to research and explain complicated problems of fighting arts, according to this new, holistic paradigm.

Cynarski, W. J., & Kubala, K. (2017). Congress in Rio Maior: the particular example of martial arts tourism and scientific tourism. / Kongres w Rio Maior: szczególnie przykład turystyki sztuk walk i turystyki naukowej. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(2), 34-40.

Background. Particular forms of non-entertainment tourism and cultural tourism include scientific and martial arts tourism. In this conference devoted to the theme of martial arts, there is a certain common range, because the objectives are complementary - in terms of scientific research, as well as martial arts studies. The problem. From the perspective of concepts of scientific tourism and martial arts tourism the problem of the description of the next event (which should be evaluated) appears to be significant for both forms of tourism. It is both a description and an evaluation of the next conference, as well as a contribution to the history of the institutionalisation of research into martial arts and combat sports. The authors are looking for characteristics and criteria for the assessment of similar events. This is also a contribution to the state of knowledge on scientific/conference tourism. Method. The first qualitative method is one case study research, including descriptive, interpretive and evaluative methods. The second is participant observation. The third is visual sociology (photos from the reviewed event). Results and Conclusions. It was established that the congress discussed here represents a specific type of conference which allows for a gathering of martial arts and combat sports experts, but is based on strictly scientific debate. The Congress also had significant historical importance for the integration of the international society of researchers into the area of martial arts and combat sports.

Cynarski, W. J., Pawelec, P., Zeng, H. Z., Yu, J.-H., Vit, M., Bielec, G., . . . Blazejewski, W. (2017). Social Determinants of Attitudes towards Health in Martial Arts: comparison between combat sports and combat systems and martial arts practitioners. / Społeczne uwarunkowania postaw wobec zdrowia w sztukach walki: porównanie praktyków sztuk, sportów i systemów walki (typu „combat”). *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(1), 23-29.

Background. The theoretical perspective for this research is inspired by Humanistic Theory of Martial Arts, the anthropology of martial arts, the sociology of health, and the sociology of physical culture/sociology of sport. Aim. This research poses two research problems. The first research problem attempts to determine the significance of the social dimension of martial arts participation, comparatively, in Poland, the Czech Republic and the United States of America. The second research problem seeks the social determinants of attitudes towards health - the behavioural component. Methods. Respondents (n =112) were students of martial arts, combat sports and combat systems from the USA, Poland and the Czech Republic. A diagnostic survey was used - Questionnaire of Health Behavior of Martial Arts Students. The variables used for comparison in the chi-square tests were: education, types of martial arts, pro-health choices, cultural area and parental level of education. Results. Results showed that the level of education, cultural origin and health choices were not related to practising martial arts, combat sports and combat systems. Conclusions. The level of education did not affect respondents' decisions to engage in practising combat sports and combat systems or martial arts (non-contact). Parental educational level, which is related to the social background, is related to practising combat sports and combat systems or martial arts (non-contact). There are no differences between cultural origin with regard to practising combat sports and combat systems or martial arts (non-contact); 4) There are no differences between cultural origin of people practising combat sports and combat systems or martial arts (non-contact) and healthy lifestyles.

Davis, P. (2017). Comment on: "It is Time to Ban Rapid Weight Loss from Combat Sports". *Sports Medicine*, 47(8), 1673-1675. doi:10.1007/s40279-017-0713-3

de Araújo, L. F., da Silva, D. F., Peserico, C. S., & Machado, F. A. (2017). Effects of LED therapy and cryotherapy recovery methods on maximal isometric handgrip strength and blood lactate removal in Brazilian Jiu-Jitsu (BJJ) practitioners. *Science & Sports*, 32(6), 376-380. doi:<https://doi.org/10.1016/j.scispo.2017.08.003>

Introduction. — The post-fight recovery is a relevant topic that is used for improvement resting in order to keep performance as high as possible jiu-jitsu fighters. This study aimed to analyze the effects of three different recovery methods: (1) local cryotherapy by cold-water immersion; (2) light-emitting diodes (LED) therapy and (3) passive recovery on maximal isometric handgrip strength and lactate concentrations ([LA]) between fights in Brazilian Jiu-Jitsu (BJJ) practitioners. *Summary of facts and results.* — Ten men BJJ practitioners, in a crossover design, underwent to all the recovery methods proposed (cryotherapy, LED therapy, and passive recovery). The participants performed three visits with interval of seven days between them, in which each recovery method was used in a random manner between two sets of simulated fights. In each visit, practitioners performed a maximal handgrip strength test followed by blood sample collection to determine [LA] before the first fight. Then, they performed two sets of simulated fights with six minutes each set and 15 min resting interval between sets. The recovery method was applied during the resting period. Although there was no statistically significant difference between recovery methods for maximal isometric handgrip strength, there was a moderate ES between cryotherapy and passive recovery (ES = 0.78) and a moderate ES between LED therapy and passive recovery (ES = 0.58) for the percentage variation of handgrip strength before and after the recovery period. *Conclusion.* — Results suggest that LED therapy and cryotherapy are associated with greater maximal isometric handgrip strength recovery between fights compared to passive recovery.

de Sousa Fortes, L., da Silva Lira, H. A. A., & Caputo Ferreira, M. E. (2017). EFEITO DA RÁPIDA PERDA DE MASSA CORPORAL NO DESEMPENHO DA TOMADA DE DECISÃO EM JUDOCAS. *EFFECT OF RAPID WEIGHT LOSS ON DECISION-MAKING PERFORMANCE IN JUDO ATHLETES.*, 28(1), 1-9. doi:10.4025/jphyseduc.v28i1.2817

To date no studies investigated the effect of an intervention on the decision-making in combat sports athletes. The aim of this study was to analyze the effect of rapid weight loss methods on the performance of decision-making in judokas. Thirty-nine male judo athletes were selected on a non-probabilistic way and randomly divided in experimental (EG) and control (CG) groups. Forty-eight hours before the beginning of data collection, athletes were submitted to anthropometrical measurements and performed a simulated fight of judo, which was filmed. The weight loss in the EG was conducted to generate a mean loss of 5% per week during 2 weeks. There was a group and moment interaction ($p < 0.01$) for body mass, with decrease only for the EG ($p = 0.01$). There was also a group and moment for the GPAI index ($p < 0.01$), with an improvement only in the CG ($p = 0.01$). It was concluded that the rapid weight loss methods were not a good strategy for performance optimization in decision-making judokas. (English)

De Souza, B. C. (2017). LESÕES OROFACIAIS EM ATLETAS. *OROFACIAL INJURIES IN ATHLETES.*, 20(1), 143-146.

Objective: to seek information in the literature related to the prevalence of oral trauma in athletes. Material and methods: analytical study, which was conducted from the Pubmed database. The search strategy employed the term Athlete with the Boolean operator and the descriptors: Oral trauma, Dental trauma and Orofacial injuries. The articles published between 2000 and January 2017 were initially selected. Sequentially, the abstracts were read and analyzed. Articles that did not address the topic and those that were duplicated were excluded. The initial search identified 480 indexed articles, 18 of which were selected to compose the final review. Results: dental and orofacial injuries are frequent and worrying. The highest prevalence of orofacial injuries are related to team sports, such as basketball and handball, and combat sports. The highest frequency of damage is related to tooth support structures, dental losses, tooth fractures, soft tissue lacerations, mandibular displacement and bone fractures. Conclusion: the orofacial trauma is a problem encountered in sports practice, and the risk of injury is greater in contact sports. The use of mouth guards can reduce the prevalence of trauma and minimize the severity of the damage.

Dopsaj, M., Markovic, M., Kasum, G., Jovanovic, S., Koropanovski, N., Vukovic, M., & Mudric, M. (2017). Discrimination of Different Body Structure Indexes of Elite Athletes in Combat Sports Measured by Multi Frequency Bioimpedance Method. *Discriminación de Diferentes Índices de Estructura Corporal de Atletas de Elite en Deportes de Combate Medidos por el Método de Bioimpedancia de Múltiples Frecuencias.*, 35(1), 199-207.

In order to achieve high results in sports, it is necessary to provide an adequate status of an athlete in according to various factors, among which the body structure is one of greater importance. The aim of this research is to define the most discriminated indicators of body structure indexes, thanks to which a specific change of physical structure can be observed according to a branch of sport and type of combat sport. Variables in the research were: body height, body mass, body mass index, free fat mass index, fat mass index, protein mass index, skeletal muscle mass index, percent of body fat, percent of skeletal muscle mass and protein fat index. The measuring of the body composition is realized by using multichannel segmental bioimpedance with InBody 720 apparatus, applied on the total of 112 male high level senior-age athlete members of different national team's member of Republic of Serbia (62 judokas, 29 Greco-Roman style wrestlers and 21 karatekas). The discriminative analysis has shown that subsamples of the athletes statistically differ in morphology on Wilks' lambda level (0.435, $p = 0.000$), and that following variables have the highest discrimination compared to athlete respondents in sport function: percent of skeletal mass (0.34), percent of body fat (0.28) and protein fat index (0.26), as the first isolated factor ($p =$

0.000) by which is explained 86.3%, that is body weight (0.74), skeletal muscle index (0.73), protein mass index (0.72), body mass index (0.72) and free fat mass index (0.70), as the second factor ($p = 0.030$) by which 13.7% variability of measured body structure space is explained. By establishing body structure models of judokas, wrestlers and karatekas for variables examined and by using modern technological method of measuring (InBody 720, 2008) we got new information that characterize specificity of the sport, which all contribute to spreading and improving already existing knowledge in the sports sciences and sport body morphology area.

Driban, J. B., Hootman, J. M., Sitler, M. R., Harris, K. P., & Cattano, N. M. (2017). Is Participation in Certain Sports Associated With Knee Osteoarthritis? A Systematic Review. *Journal of Athletic Training (Allen Press)*, 52(6), 497-506. doi:10.4085/1062-6050-50.2.08

West Chester University of Pennsylvania Objective: Information regarding the relative risks of developing knee osteoarthritis (OA) as a result of sport participation is critical for shaping public health messages and for informing knee-OA prevention strategies. The purpose of this systematic review was to investigate the association between participation in specific sports and knee OA. Data Sources: We completed a systematic literature search in September 2012 using 6 bibliographic databases (PubMed; Ovid MEDLINE; Journals@Ovid; American College of Physicians Journal Club; Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Review, Database of Abstracts of Reviews of Effects; and Ovid HealthStar), manual searches (4 journals), and reference lists (56 articles). Study Selection: Studies were included if they met the following 4 criteria: (1) an aim was to investigate an association between sport participation and knee OA; (2) the outcome measure was radiographic knee OA, clinical knee OA, total knee replacement, self-reported diagnosis of knee OA, or placement on a waiting list for a total knee replacement; (3) the study design was case control or cohort; and (4) the study was written in English. Articles were excluded if the study population had an underlying condition other than knee OA. Data Extraction: One investigator extracted data (eg, group descriptions, knee OA prevalence, source of nonexposed controls). Data Synthesis: The overall knee-OA prevalence in sport participants ($n = 3759$) was 7.7%, compared with 7.3% among nonexposed controls (referent group $n = 4730$, odds ratio [OR] = 1.1). Specific sports with a significantly higher prevalence of knee O A were soccer (OR = 3.5), elite-level long-distance running (OR = 3.3), competitive weight lifting (OR = 6.9), and wrestling (OR = 3.8). Elite-sport (soccer or orienteering) and nonelite-sport (soccer or American football) participants without a history of knee injury had a greater prevalence of knee OA than nonexposed participants. Conclusions: Participants in soccer (elite and nonelite), elite-level long-distance running, competitive weight lifting, and wrestling had an increased prevalence of knee OA and should be targeted for risk-reduction strategies.

Driska, A. P., Gould, D. R., Pierce, S., & Cowburn, I. H. J. (2017). Understanding psychological changes in adolescent wrestlers participating in an intensive training camp: A mixed-methods investigation. *International journal of sport psychology*, 48(3), 303-330.

Research has indicated that adversity created in training environments can develop mental toughness in adolescent athletes (Bell, Hardy, & Beattie, 2013; Connaughton, Hanton, & Jones, 2010; Gucciardi, Gordon, & Dimmock, 2008). However, few studies (Bell et al, 2013) have explored this development prospectively. Employing a pragmatic, longitudinal, mixed methods design, this study assessed 70 adolescent wrestlers participating in an established intensive wrestling camp that systematically employed adversity. The Trait Sport Confidence Inventory, the State Hope Scale, and the Athletic Coping Skills Inventory-28 were administered at the outset, conclusion, and nine-months-following the camp. A repeated measures MANOVA with post-hoc measures showed increases in seven variables, maintained at the nine-month follow-up, with the strongest partial effect sizes in hope ($\eta = .242$), sport confidence ($\eta = .151$), and coping with adversity ($\eta = .142$). Interviews with eight participants, conducted throughout the camp, one-week post-camp, and nine-months post-camp, yielded five high-order themes: enhanced confidence, work ethic, development of empowering attributes (e.g., responsibility, internal control), enhanced thought processes (e.g., self-awareness), and enhanced interpersonal skills. Results suggest that this highly-structured adverse training environment has the ability to develop a range of skills and dispositions related to mental toughness, and that some of these factors may transfer to other life contexts.

Dunn, E. C., Humberstone, C. E., Iredale, K. F., Martin, D. T., & Blazeovich, A. J. (2017). Human behaviours associated with dominance in elite amateur boxing bouts: A comparison of winners and losers under the Ten Point Must System. *PLoS ONE*, 12(12), 1-12. doi:10.1371/journal.pone.0188675

Humans commonly ascertain physical dominance through non-lethal fighting by participating in combat sports. However, the behaviours that achieve fight dominance are not fully understood. Amateur boxing competition, which is judged using the subjective "Ten Point Must-System", provides insight into fight dominance behaviours. Notational analysis was performed on 26 elite male competitors in a national boxing championship. Behavioural (guard-drop time; movement style [stepping/bouncing time]; clinch-time; interaction-time) and technical (total punches; punches landed [%Hit]; air punches [%Air]; defence) measures were recorded. Participants reported effort required (0-100%) and perceived effect of fatigue on their own performance (5-point Likert scale) following bouts. Differences between winners and losers, and changes across the duration of the bout were examined. Winners punched more accurately than losers (greater %Hit [33% vs. 23%] and lower %Air [17% vs. 27%]) but total punches, defence and interaction-time were similar. From rounds 1-2, clinch-time and guard drops

increased whilst bouncing decreased. Perceived effect of fatigue increased throughout the bout while perceived effort increased only from rounds 2–3. %Hit and movement index together in regression analysis correctly classified 85% of bout outcomes, indicating that judges (subjectively) chose winning (dominant) boxers according to punch accuracy and style, rather than assertiveness (more punches thrown). Boxers appear to use tactical strategies throughout the bout to pace their effort and minimise fatigue (increased guard drops, reduced bouncing), but these did not influence perceived dominance or bout outcome. These results show that judges use several performance indicators not including the total number of successful punches thrown to assess fight dominance and superiority between fighters. These results provide valuable information as to how experienced fight observers subjectively rate superiority and dominance during one-on-one human fighting.

Durkalec-Michalski, K., Jeszka, J., & Podgorski, T. (2017). The Effect of a 12-Week Beta-hydroxy-beta-methylbutyrate (HMB) Supplementation on Highly-Trained Combat Sports Athletes: A Randomised, Double-Blind, Placebo-Controlled Crossover Study. *Nutrients*, 9(7). doi:10.3390/nu9070753

The aim of this study was to verify the effect of beta-hydroxy-beta-methylbutyrate (HMB) supplementation on physical capacity, body composition and the value of biochemical parameters in highly-trained combat sports athletes. Forty-two males highly-trained in combat sports were subjected to 12 weeks of supplementation with HMB and a placebo in a randomized, placebo controlled, double-blind crossover manner. Over the course of the experiment, aerobic and anaerobic capacity was determined, while analyses were conducted on body composition and levels of creatine kinase, lactate dehydrogenase, testosterone, cortisol and lactate. Following HMB supplementation, fat-free mass increased ($p = 0.049$) with a simultaneous reduction of fat mass ($p = 0.016$) in comparison to placebo. In turn, after HMB supplementation, the following indicators increased significantly in comparison to the placebo: the time to reach ventilatory threshold ($p < 0.0001$), threshold load ($p = 0.017$) and the threshold HR ($p < 0.0001$), as well as anaerobic peak power ($p = 0.005$), average power ($p = 0.029$), maximum speed ($p < 0.001$) and post-exercise lactate concentrations ($p < 0.0001$). However, when compared to the placebo, no differences were observed in blood marker levels. The results indicate that supplying HMB promotes advantageous changes in body composition and stimulates an increase in aerobic and anaerobic capacity in combat sports athletes.

Eichmann, B., Kobes, J., Sherve, C., Aho, A., Saghiv, M. (2017). *International journal of wrestling science*, 7(1).

The University of Mary Wrestling Anaerobic Performance Test (UMWAPT) protocol simulates the requirements of a full wrestling match. The purpose of the study was to compare and correlate the mechanical outcomes of the WANt and the UMWAPT. Fifteen wrestlers randomly underwent both protocols. Mechanical outputs (W) and fatigue index (%) were calculated and compared between the protocols and within the UMWAPT. Peak power correlations between protocols were weak to moderate and weak to strong within the UMWAPT test. Mean power correlations between protocols were weak and weak to strong within the UMWAPT test. Anaerobic capacity correlations between the protocols were weak and weak to strong within the UMWAPT test. Fatigue index correlations between protocols were weak and weak to moderate within the UMWAPT test. All participants indicated the UMWAPT as a very accurate simulation of their most challenging wrestling match. In conclusion, The UMWAPT seems to be a very good protocol to simulate a wrestler's most challenging match. The UMWAPT allowed the wrestlers to utilize their own technique, leading to better mechanical outputs, and, thus, it seems that this study gives hope that a wrestling-specific all-out performance protocol such as the UMWAPT may be utilized rather than a nonspecific protocol such as the WANt.

Evans, L. W., & Omaye, S. T. (2017). Use of Saliva Biomarkers to Monitor Efficacy of Vitamin C in Exercise-Induced Oxidative Stress. *Antioxidants*, 6(1). doi:10.3390/antiox6010005

Saliva is easily obtainable for medical research and requires little effort or training for collection. Because saliva contains a variety of biological compounds, including vitamin C, malondialdehyde, amylase, and proteomes, it has been successfully used as a biospecimen for the reflection of health status. A popular topic of discussion in medical research is the potential association between oxidative stress and negative outcomes. Systemic biomarkers that represent oxidative stress can be found in saliva. It is unclear, however, if saliva is an accurate biospecimen as is blood and/or plasma. Exercise can induce oxidative stress, resulting in a trend of antioxidant supplementation to combat its assumed detriments. Vitamin C is a popular antioxidant supplement in the realm of sports and exercise. One potential avenue for evaluating exercise induced oxidative stress is through assessment of biomarkers like vitamin C and malondialdehyde in saliva. At present, limited research has been done in this area. The current state of research involving exercise-induced oxidative stress, salivary biomarkers, and vitamin C supplementation is reviewed in this article.

Fereira-Vorkapic, C., Feitoza, J. P., Martins Dantas, E. H., & Bastos, A. (2017). The impact of yoga-based interventions on jiu-jitsu wrestlers' psychological profile: a pilot study. *Gazzetta Medica Italiana Archivio Per Le Scienze Mediche*, 176(7-8), 390-401. doi:10.23736/s0393-3660.17.03398-8

BACKGROUND: Athletic activities are naturally competitive. Different studies have shown that mental training is an effective intervention for improving mood and athletic performance. Contemplative practices such as yoga and mindful meditation have been successfully used as part of the mental training of athletes. Therefore, the goal of this study was to observe the impact of a yoga-based intervention (YBI) on the mental state of jiu-jitsu wrestlers. METHODS: Twenty participants were allocated to two

treatment conditions: Group 1 (G1; YBI) attended yoga-based interventions and Group 2 (G2; control) participated in group talks. RESULTS: Significant time effects were found across the YBI group on the following variables: anxiety, anger, fatigue and tension, indicating that on YBI group, mood improve from pre-to post-test. CONCLUSIONS: YBI has preliminarily shown to provide mental benefits for athletes including factors related to enhanced performance, such as reduced tension, fatigue and anxiety levels.

- Fontana, M., & Fry, M. (2017). Creating and Validating the Shame in Sport Questionnaire. *Journal of sport behavior*, 40(3), 278. Research exploring shame proneness has been substantial (Lewis, 1971; Tangney & Dearing, 2002; Tangney, Miller, Flicker, & Barlow, 1996). However, studies investigating shame's impact on athletes is more limited. A scale exploring why athletes may experience shame in sport would be beneficial to understanding how the emotion may manifest in individuals on teams. High school wrestlers (N=216) participated in a study to validate the Shame in Sport Questionnaire (SSQ) while exploring shame's relationship with goal orientations. The SSQ included two scales, result and process shame. Exploratory and confirmatory factor analyses were conducted to examine the factor structure of the measure, and structural equation modeling was employed to consider the effect of task and ego orientation, respectively, on process and outcome shame. The SSQ was shown to be a valid instrument for measurement. Additionally, SEM analyses revealed that individuals reporting high task-orientation were more likely to experience process shame and less likely to experience result shame, while individuals reporting high ego-orientation were more likely to experience result and process shame. High task orientation appears to help athletes limit the shame they may experience from factors such as losing and performance outcomes for which they have little control.
- Forrest, D., McHale, I. G., Sanz, I., & Tena, J. D. (2017). An analysis of country medal shares in individual sports at the Olympics. *European Sport Management Quarterly*, 17(2), 117-131. Research question: Several studies report modelling relating countries' medal shares at the Olympics to population and per capita income (host status and political system are typically included as controls). This paper uses a similar model but disaggregates to the level of the individual sport to ask questions such as whether some sports have a less steep relationship with income levels than others and whether hosting effects are more pronounced in some sports than others. Research methods: Employing a random effects tobit model, data on medal shares are modelled across 15 sports at six editions of the Games (1992–2012). Marginal effects, calculated for the case of cycling, illustrate how far many poor countries are from reasonable expectation of achieving medals. Results and findings: Income is influential on outcomes in all sports, its effects most pronounced in sports with substantial requirements for specific capital equipment; the distribution of medals is less unequal in sports practised in multi-sports venues. Gains from hosting vary in magnitude, performance tending to be elevated most in sports with outcomes strongly influenced by judges. Implications: For poorer countries, the paper identifies a small group of sports on which it would be most realistic to focus resources. For Games organisers, who must decide which sports to include, it provides information relevant to the goal of spreading success more evenly across countries. For example, proposals to exclude wrestling are shown to have been potentially harmful to medal prospects of poorer countries.
- Fortes, L. d. S., Lira, H. A. d. S., & Ferreira, M. E. C. (2017). Effect of rapid weight loss on decision-making performance in judo athletes. [Efeito da rápida perda de massa corporal no desempenho da tomada de decisão em judocas]. *Journal of Physical Education*, 28(0), e2817-e2817. doi:10.4025/jphyseduc.v28i1.2817 ABSTRACT To date no studies investigated the effect of an intervention on the decision-making in combat sports athletes. The aim of this study was to analyze the effect of rapid weight loss methods on the performance of decision-making in judokas. Thirty-nine male judo athletes were selected on a non-probabilistic way and randomly divided in experimental (EG) and control (CG) groups. Forty-eight hours before the beginning of data collection, athletes were submitted to anthropometrical measurements and performed a simulated fight of judo, which was filmed. The weight loss in the EG was conducted to generate a mean loss of 5% per week during 2 weeks. There was a group and moment interaction ($p < 0.01$) for body mass, with decrease only for the EG ($p = 0.01$). There was also a group and moment for the GPAI index ($p < 0.01$), with an improvement only in the CG ($p = 0.01$). It was concluded that the rapid weight loss methods were not a good strategy for performance optimization in decision-making judokas.
- Fukuda, D., Kelly, J., Albuquerque, M., Stout, J., & Hoffman, J. (2017). Relative age effects despite weight categories in elite junior male wrestlers. *Sport Sciences for Health*, 13(1), 99-106. Aims: To evaluate relative age effects (RAEs) in wrestlers at the junior world championships. Methods: Data for wrestling athletes representing 77 different countries that participated in the junior (under 21 years of age) world championships between 2006 and 2014 were collected from a publicly available source. RAEs were examined among 807 female freestyle, 1205 male freestyle, and 1202 male Greco-Roman wrestlers. Athletes were sub-categorized by weight class, as medalists, and according to the number of years active in wrestling. The observed frequency of athletes per birth quarter was compared to an even quarterly distribution using χ tests. Results: No RAEs were shown for female freestyle wrestlers. For male freestyle wrestlers, RAEs were found for the overall group, the medalists, all but the extra lightweights (under 50/55 kg), and both the least (<5 years active) and moderately (5-7 years active) experienced. For male Greco-Roman wrestlers, RAEs were shown for the overall group, the middle (under 74/84 kg) and heavy weights (under 96/120 kg), and only the moderately experienced (5-

7 years active). Conclusions: Despite weight categorization, junior male wrestlers are susceptible to RAEs; however, effects in the lightest and most experienced athletes may be diminished. Differences across weight categories appear to convey different trends between the male freestyle and Greco-Roman athletes. Thus, sporting organizations, training staff, and others interested in the welfare of athletes should consider the potential impact of RAEs in wrestling.

Gärtner, H., Müller, C. S. L., Becker, S. L., & Bozzato, A. (2017). A different kind of wrestler's ear. [Das Ringerohr der etwas anderen Art.] *HNO*. doi:10.1007/s00106-017-0435-8

We report the case of a 19-year-old patient who presented with recurrent circular and scaly skin changes. The patient reported wrestling as his main leisure activity. After an unsuccessful attempt at local antibiotic treatment, detailed dermatological work-up revealed the skin changes to be tinea corporis gladiatorum. According to dermatological guidelines for dermatophytosis, systemic treatment with fluconazole and local ointments containing ciclopirox olamine and ketoconazole were administered, which rapidly led to significant improvement.

Gierczuk, D., Lyakh, V., Sadowski, J., & Bujak, Z. (2017). Speed of Reaction and Fighting Effectiveness in Elite Greco-Roman Wrestlers. *Perceptual & Motor Skills*, 124(1), 201-213.

The purpose of the study was to determine the changes in simple reaction time and to define correlations between simple reaction time and technical and tactical actions performed by elite Greco-Roman wrestlers during a match. Twenty Greco-Roman wrestlers (M age = 19.5 years, SD = 1.8) from the Wrestling Sports Centre in Radom participated in the study. Simple reaction time (including reaction time and movement time) before a match and after the first, the second, and the third round was analyzed. The wrestlers' reaction time and movement time changed in the course of performance. Wrestlers with higher sports achievements demonstrated a smaller decrement in simple reaction time and performed more technical and tactical actions during a match. The strongest correlations were observed between both reaction time and movement time and the number of technical and tactical actions performed during the last round. Quick reaction was a significant factor in determining the match outcome, which is revealed at submaximal intensity of the effort during a match.

Gkrekidis, A., Barbas, I. (2017). *Psychological factors and their relation with performance in women's Olympic wrestling*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad, Serbia.

PURPOSE: It is scientifically proved that the psychological profile (spiritual power) of the wrestler has the same and even more importance with the natural characteristics of the athlete. Purpose of this research is to define the psychological factors that affect the performance in modern women's Olympic wrestling. METHOD: One hundred elite female wrestlers from 13 different countries participated volunteering in this research (n=100), their ages were between 18 and 29 years old and they participated in the «Dan Kolov-Nikola Petrov» tournament that took place in Sofia, Bulgaria and in the Hitit University championship that took place in Corum, Turkey in 2016. The athletes were asked to complete a specially designed, closed-type questionnaire consisted of 13 questions with 16 variables. Each question was related to a specific psychological characteristic, that can contribute in wrestling performance. The questionnaire was translated into four languages (English, French, Russian and Bulgarian) and a seven point scale was used to record the answer. The reliability of the questionnaire was tested with Cronbach coefficient alpha=0.82. The descriptive statistics and factor analysis were used for statistical analysis of data. RESULTS: The results of this study showed that in most athletes will, self-confidence, tactics, concentration, calmness and aggression were the most important and decisive factors for high performance. Regarding the Emotional intelligence and perception, the mood and passion women have positively increased indicators while the rapid alternation of emotions and adaptation to the realities indicators, are significantly lower. These findings can be very useful for coaches and scientists in their continuous efforts to improve performance in the women's Olympic wrestling.

Gligorov, S., Bogdanov, V. (2017). *Basic and specific fitness tests for freestyle wrestlers realized in the Republic of Macedonia: A review of research*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.

PURPOSE: The main goal was to perform a review of previous studies the tests of which were applied to assess basic and situation-specific motor fitness/abilities of freestyle wrestlers in the Republic of Macedonia. The second goal was to draw some conclusions about the sample of respondents, application of basic and situation-specific motor tests, data processing methods, and outcomes of research. METHODS: The empirical method was applied to analyze all available articles and documents on this topic usage of basic and specific fitness tests for freestyle wrestlers. RESULTS: Based on the review and analysis of the research, we can conclude that all measurement procedures and all records of testing and application of methods for data processing in the analysed studies were in accordance with the standard methodological requirements that apply to these types of tests. In most applied tests a satisfactory degree of measurement features was determined. In freestyle wrestlers we determined a relatively clean and clear existence of the following structure of factors of the basic motor tests: explosive power, dynamometric force, coordination, strength (repetitive and static), balance, flexibility, frequency of movement. In the situation-specific motor tests, four latent situation-specific motor dimensions were isolated: the factor of complex situation-specific ability in standing and parterre positions, the factor of situation-specific ability to perform complex techniques of throws, the

factor of situation-specific ability to quickly perform complex tasks in situational martial bridge, factor of situational ability to quickly transition from standing to parterre and vice versa. Basic motor skills – coordination, dynamometric force, power (repetitive and static), frequency of movements, explosive power, balance, and greater flexibility have hierarchically dominant influence on the determination of individually isolated situation-specific latent motor factors. CONCLUSIONS: Based on a previous review research on this topic (Basic and specific fitness tests for freestyle wrestlers realized in Republic of Macedonia), it can be concluded that the application of multivariate methods is very important and useful for determining the factorial structure and measurement features, and for the establishment of relations between the basic motor tests and situation-specific motor tests in freestyle wrestlers. Basic motor skills – coordination, dynamometric force, power (repetitive and static), frequency of movements, explosive strength, balance and flexibility, have hierarchically dominant influence on performance in freestyle wrestling. The findings may find their application in the implementation to further research projects related to the treated problems and they can also be used in the talent identification and selection of young wrestlers, and in rational, objective and cost-effective planning and programming of training process for different age categories in martial clubs and national teams.

- González Hernández, J., & González Reyes, A. (2017). Perfeccionismo y "alarma adaptativa" a la ansiedad en deportes de combate. *Perfectionism and "adaptive alarm" to anxiety in sports fighting. Journal of Sport Psychology*, Vol 26, Suppl 2, 15-23. The description of the characteristics of personality in sports has been one of the most popular topics for Sport Psychology, there are different lines of investigation. However, they have been smaller studies especially in combat sports. This study addresses the analysis of how the indicators of perfectionism relate to the vulnerability and sensitivity to anxiety symptoms. The sample consists of 110 athletes of combat, of which 78 men and 32 women. Different questionnaires were used to measure the study's variables, all of them adapted to Spanish population. We used different questionnaires adapted to Spanish population for the measurement of perfectionism (FMPS) and anxiety sensitivity (ASI-3). Results suggest that the lack of consistency between personal standards and own organization for sport (personal routines in training, rest, preparation of competitions, etc.) relate significantly with cognitive confusion and discrepancies. Differentiation by gender, women report significant differences in personal standards and vulnerability to social anxiety. Are doubts about actions and perceptions of parental expectations, the dimensions of perfectionism that more reactivity to alter social and physical anxiety. It can be said that although the existence of sensitivity symptoms of anxiety states, lack of resources for understanding and intervention will allow the development of the pathology of anxiety, early detection of key elements in their relationship with the personality allow anticipate and prepare for the athlete before his appearance through integrated strategies and psychological training to convert negative signals "adaptive alarms" sports practice and implementation resources.
- Gould, D., Pierce, S., Cowburn, I., & Driska, A. (2017). How Coaching Philosophy Drives Coaching Action: A Case Study of Renowned Wrestling Coach J Robinson. *International Sport Coaching Journal*, 4(1), 13-37. This case study examined the coaching philosophy of J Robinson, one of the most respected and successful NCAA wrestling coaches in the United States, and the founder of J Robison Intensive Wrestling Camps. Research has that shown that his camps foster short and long term psychological development in its youth participants (Driska et al., in press; Pierce, et al., 2016). He has established a well-delineated system for developing psychological skills in young athletes. The researchers were therefore interested in understanding the link between his coaching philosophy and coaching behavior, and in identifying factors that have influenced the development of this coaching philosophy over his lifetime. Using a case study approach, in-depth interviews at several points in time with Robinson were conducted. These were supplemented with interviews with camp staff and observations of the camp and Robinson's coaching. Results revealed that Robinson had a clearly defined philosophy, was very intentional in developing mental skills, and had clearly thought out rationales that guided his coaching actions. The coaching philosophy and approach to developing psychological skills in youth evolved over 35 years of implementing these camps and from Robinson's own life experiences. Implications for studying coach development and delivering coaching education are provided.
- Greenwell, T. C., Simmons, J. M., Hancock, M., Shreffler, M., & Thorn, D. (2017). The Effects of Sexualized and Violent Presentations of Women in Combat Sport. *Journal of Sport Management*, 31(6), 533-545. doi:10.1123/jism.2016-0333 This study utilizes an experimental design to investigate how different presentations (sexualized, neutral, and combat) of female athletes competing in a combat sport such as mixed martial arts, a sport defying traditional gender norms, affect consumers' attitudes toward the advertising, event, and athlete brand. When the female athlete in the advertisement was in a sexualized presentation, male subjects reported higher attitudes toward the advertisement and the event than the female subjects. Female respondents preferred neutral presentations significantly more than the male respondents. On the one hand, both male and female respondents felt the fighter in the sexualized ad was more attractive and charming than the fighter in the neutral or combat ads and more personable than the fighter in the combat ads. On the other hand, respondents felt the fighter in the sexualized ad was less talented, less successful, and less tough than the fighter in the neutral or combat ads and less wholesome than the fighter in the neutral ad.

Hausen, M., Soares, P. P., Araujo, M. P., Porto, F., Franchini, E., Bridge, C. A., & Gurgel, J. (2017). Physiological responses and external validity of a new setting for taekwondo combat simulation. *PLoS ONE*, 12(2). doi:10.1371/journal.pone.0171553

Combat simulations have served as an alternative framework to study the cardiorespiratory demands of the activity in combat sports, but this setting imposes rule-restrictions that may compromise the competitiveness of the bouts. The aim of this study was to assess the cardiorespiratory responses to a full-contact taekwondo combat simulation using a safe and externally valid competitive setting. Twelve male national level taekwondo athletes visited the laboratory on two separate occasions. On the first visit, anthropometric and running cardiopulmonary exercise assessments were performed. In the following two to seven days, participants performed a full-contact combat simulation, using a specifically designed gas analyser protector. Oxygen uptake (VO_2), heart rate (HR) and capillary blood lactate measurements ($[\text{La}^-]$) were obtained. Time-motion analysis was performed to compare activity profile. The simulation yielded broadly comparable activity profiles to those performed in competition, a mean (VO_2) of $36.6 \pm 3.9 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ ($73 \pm 6\%$ (VO_2PEAK)) and mean HR of $177 \pm 10 \text{ beats}\cdot\text{min}^{-1}$ ($93 \pm 5\%$ HRPEAK). A peak (VO_2) of $44.8 \pm 5.0 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ ($89 \pm 5\%$ (VO_2PEAK)), a peak heart rate of $190 \pm 13 \text{ beats}\cdot\text{min}^{-1}$ ($98 \pm 3\%$ HRmax) and peak $[\text{La}^-]$ of $12.3 \pm 2.9 \text{ mmol}\cdot\text{L}^{-1}$ was elicited by the bouts. Regarding time-motion analysis, combat simulation presented a similar exchange time, a shorter preparation time and a longer exchange-preparation ratio. Taekwondo combats capturing the full-contact competitive elements of a bout elicit moderate to high cardiorespiratory demands on the competitors. These data are valuable to assist preparatory strategies within the sport.

Henning, A. D., & Dimeo, P. (2017). The new front in the war on doping: Amateur athletes. *The International journal on drug policy*. doi:10.1016/j.drugpo.2017.05.036

The war on drugs is usually associated with criminal policies aimed at stemming consumption of drugs such as heroin, cocaine, and cannabis, less so with enhancement drugs like those used in sport. As drug use in sport, or doping, has become more visibly widespread, policies aimed at combating the issue have become more restrictive, intrusive, and harsh. In this article we draw new comparisons between the wider war on drugs and recent developments in sports anti-doping. We identify a growing trend towards criminalisation of traffickers and users, and associate that with another growing trend: the testing of amateur athletes. This article reviews the current anti-doping system, including the recent amateur policies, then considers the results of one such program in amateur cycling. We then shift to consider the possible implications for amateurs of criminal doping laws and the recent debates about allowing medical exemptions for therapeutic use of banned substances. We show that drug use in sport can be understood as a new front in the war on drugs, with some extreme measures and many negative unintended consequences. To remedy this, we argue that amateur athletes require a separate anti-doping policy focused on minimising harms of use.

Herrera-Valenzuela, T., & ValdÉS-Badilla, P. (2017). "Martial Arts and Combat Sports: Science, Research and Culture" hosted by the University of Santiago, Chile (USACH). / „Sztuki walki i sporty walki: Nauka, badania i kultura” na Uniwersytecie Santiago w Chile. *Do Movement for Culture. Journal of Martial Arts Anthropology*, 17(1), 54-57.

Introduction. Martial arts and combat sports are practiced by thousands of persons around the world and increasingly discussed in scientific publications. Material and Methods. We describe an observational case study by describing and analyzing the activities of the "Martial Arts and Combat Sports: Science, Research and Culture" event hosted by the University of Santiago, Chile. Results. Activities were organized by the School of Physical Activity, Sports and Health, August 16-19, 2016 and included six plenary conferences, six theoretical practical workshops, one Muay Thai clinic and the launch of the Combat Sports and Martial Arts Research Group. This was the first event of this type in Chile and had 370 participants. Conclusions. In conclusion the objectives of the activities were accomplished because both science and cultural aspects of the sports were considered in an academic context. Among the participants were academics from several universities, students from physical activity-related majors, coaches, instructors and martial arts practitioners. The activities provided momentum for new challenges in 2017, including the organization of a martial arts and combat sports society and the first Chilean conference on martial arts and combat sports.

Herzog, M. M., Fraser, M. A., Register-Mihalik, J. K., & Kerr, Z. Y. (2017). Epidemiology of Skin Infections in Men's Wrestling: Analysis of 2009-2010 Through 2013-2014 National Collegiate Athletic Association Surveillance Data. *Journal of Athletic Training (Allen Press)*, 52(5), 457-463.

Context: Our knowledge of the current epidemiology of skin infections among wrestlers is limited. Objective: To analyze and report the epidemiology of skin infections among National Collegiate Athletic Association (NCAA) men's wrestling student-athletes during the 2009- 2010 through 2013-2014 academic years. Design: Descriptive epidemiology study. Setting: Aggregate skin infection and exposure data collected by the NCAA Injury Surveillance Program. Patients or Other Participants: Collegiate men's wrestling student-athletes. Main Outcome Measure(s): All viral, bacterial, or fungal skin infections reported by athletic trainers at 17 NCAA programs were analyzed, providing 35 team-seasons of data. Skin infection rates per 10 000 athlete-exposures (AEs), rate ratios, skin infection proportions, and skin infection proportion ratios were calculated. Results: The athletic trainers reported 112 skin infections contracted by 87 student-athletes across 78 720 AEs. The overall skin infection rate was 14.23/10 000 AEs (95% confidence interval [CI] = 11.59, 16.86). Of the skin infections identified, 22.3% (n = 25) were recurrent skin infections. Most skin infections (65.2%) were attributable to 5 team-seasons (range, 11-19 infections). Most skin

infections occurred during the regular season (n = 76, 67.9%), were identified during practice (n = 100, 89.3%), and resulted in ≥24 hours' time loss (n = 83, 74.1%). The rate for viral skin infections was 1.72 times the rate for bacterial skin infections (95% CI = 1.09, 2.72) and 2.08 times the rate for fungal skin infections (95% CI = 1.28, 3.39). Fungal skin infections more often resulted in time loss ≥24 hours compared with all other skin infections (75.0% versus 12.5%; infection proportion ratio = 6.00; 95% CI = 3.30, 10.92). Conclusions: Our findings highlight the contagiousness of skin infections and suggest that skin infection rates may be attributable to high incidences among particular teams.

Hortiguela, D., Gutierrez-Garcia, C., & Hernando-Garijo, A. (2017). Combat versus team sports: the effects of gender in a climate of peer-motivation, and levels of fun and violence in physical education students. / Sporty walki kontra sporty zespołowe: wpływ płci na atmosferę motywacji, zabawy i przemocy wśród uczniów-rówieśników w trakcie zajęć wychowania fizycznego. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(3), 11-20.

Background and aim. The inclusion of martial arts and combat sports (MA&CS) in formal physical education (PE) has been suggested by many authors, although there is no strong evidence as yet of the benefits of its practice for students. This study aimed to describe the effects of the development of two MA&CS teaching units (judo and capoeira) on the motivational climate, enjoyment and attitudes toward violence of PE students, and to compare these effects with those experienced by students receiving team sports teaching units (football and basketball). Methodology. A quasi-experimental, pre-post (two groups), longitudinal study design was followed, involving 221 students aged between 13 and 16. The experimental group (n = 105) developed MA&CS teaching units, while the control group (n = 116) developed team sport, teaching units. A peer motivational climate questionnaire, the amusement/boredom in physical education scale and the attitudes toward violence scale psychological assessment tools were used. Statistical analyses included means and standard deviations, two-way equivalent multifactorial ANOVA and effect sizes Results: MA&CS teaching units significantly improved the classroom motivational climate involving tasks/learning, and students' attitudes toward unjustified violence. The post-test intergroup comparison showed that the experimental group rejected unjustified violence to a higher degree than the control group (p = .014, d = .81). Improvements in attitudes to unjustified violence were for both males (p = .017, d = .82), and females (p = .021, d = .78) in the experimental group, while the climate involving tasks/learning only improved in males (p = .037, d = .77). Conclusion. MA&CS teaching units improved students' attitudes toward violence and generated a higher peer motivational climate than, and similar fun as team sports teaching units. ABSTRACT FROM AUTHOR

Hostettler-Blunier, S., Muller, N., Haltmeier, T., Hosner, A., Bahler, H., Neff, F., . . . Schnuriger, B. (2017). Public Medical Preparedness at the "Swiss Wrestling and Alpine Games 2013": Descriptive Analysis of 1,533 Patients Treated at the Largest 3-Day Sporting Event in Switzerland. *Emergency medicine international*, 2017, 9162095-9162095. doi:10.1155/2017/9162095

Introduction. Medical preparedness at mass gatherings is challenging, as little is known about the optimal planning. Most studies and case reports are based on mass casualty incidents, so the results cannot be extrapolated to mass gatherings. Aim of this study was to evaluate the preclinical medical structure and the frequency of specific injuries and medical emergencies during the event. Methods. Retrospective analysis of a prospectively collected database. Three on-site medical assistance points were set up, completed by mobile teams, and coordinated by an on-site operational management team. Medical staff requirements were calculated using Maurer's formula. Results. A total of 1,533 patients were treated during the three-day event. Overall, the medical usage rate (MUR; patients per 10,000 visitors) was 51.1. A total of 58 patients (3.8%) required a hospital transfer. In 1,063 cases (69.3%) a diagnosis was documented. Of these, 503 patients (47.3%) suffered from hymenoptera stings; the two most common non-trauma-related diagnoses were alcohol/drug intoxication (4.1%) and gastrointestinal diseases (4.0%). Conclusion. Overall, the on-site medical care worked well. However, a high frequency of hymenoptera stings occurred, resulting in a shortage of antihistamine medication. Moreover, more than half of the patients were managed at the second largest medical assistance point. Prospective and critical evaluation of medical care at mass gatherings is crucial in order to optimize on-site medical preparedness at future events.

Hyttén, K., & Tonsaker, S. K. (2017). Medical ethics in combat sports that permit knockouts. *Tidsskrift for Den Norske Lægeforening*, 137(17), 1347-1348. The Council for Medical Ethics discourages doctors from accepting to act as ringside doctor for combat sports that permit knockouts or participating in approvals or appeals boards for such events. These types of assignments may violate the general duty of doctors to protect human health. Sports medicine encompasses all medical aspects of sports. One important task of the sports doctor is to prevent and treat sports injuries (1). In today's elite sports, the body is frequently exposed to stresses that approach and occasionally exceed the limits of what it can tolerate. This was recently thrown into sharp relief in the article 'The body as the Achilles heel of sports', in which Rune Slagstad discusses how medical expertise has assumed a dual role of promoter and degrader of health in the development of sports (2). Some sports involve a major risk of serious injuries, and this is a challenge to the doctor's role. Chapter I, Section 1 of the Code of Ethics for Doctors describes the doctor's role as follows: 'A doctor shall protect human health. A doctor shall help the ill to regain their health and the healthy to preserve theirs' (3). Concerns for a contestant's health on the one hand and optimisation of his or her performance on the other is a general ethical dilemma for sports doctors, who thus may come under pressure to prioritise purely sports and commercial interests.

- Ibis, S. (2017). The relationship of balance performance in young female national team wrestlers with strength, leg volume and anthropometric features. *Biomedical Research (0970-938X)*, 28(1), 92-97.
- The purpose of the study was to determine the relationship of strength, leg volume, and anthropometric features of Turkish National Team Young Female wrestlers with balance performance. Totally 17 volunteer sportsmen with 18.43 ± 2.25 age average, 165.25 ± 6.90 cm height average, 61.37 ± 8.24 weight average, 22.22 ± 1.63 kg/m² Body Mass Index (BMI), and 51.25 ± 6.93 kg Free Fat Mass (FFM) participated into the study. Leg and foot volume of the sportsmen participated into the study were evaluated using Frustum method, their leg strengths were evaluated using leg dynamometer, and balance performances were evaluated using Biodex Balance System. Balance performances were measured on double feet as dynamic and static. Spearman Correlation Analysis test as a non-parametric test was used for the statistical analysis of the data. A positive relationship was determined between leg strength and static balance ($r=0.735$ $p<0.001$), dynamic balance ($r=0.690$ $p<0.003$), leg volume ($r=0.692$ $p<0.003$), foot volume ($r=0.735$ $p<0.001$) and BMI ($r=0.508$ $p<0.012$); between static balance and dynamic balance ($r=0.572$ $p<0.05$), leg volume ($r=0.87$ $p<0.01$), foot volume ($r=0.841$ $p<0.01$) and FFM ($r=0.626$ $p<0.001$), and dynamic balance and leg volume ($r=0.583$ $p<0.05$), leg volume ($r=0.575$ $p<0.05$), BMI ($r=0.646$ $p<0.05$) and FFM ($r=0.529$ $p<0.005$) in female wrestlers. Consequently, it was concluded that increase at wrestlers' strength, leg volume and foot volume positively affected balance skill, strength and leg volumes were required to be developed at an adequate level in wrestling in which balance was essential. Moreover, it was also determined that associating the balance performance with FFM instead of BMI would be more correct.
- Imamoglu, O., Soygüden, A., Türkmen, M. (2017). *Comparison of female wrestler and female judokas' weight loss situations*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.
- AIM: The aim of this research is to compare the women wrestlers and judoist weight loss situations in Turkey. MATERIAL AND METHOD: According to the voluntary principle, 153 women wrestlers and 132 women judoists were filled out the questionnaire developed by the researchers. Statistically t-test and chi-square test were used. RESULTS: The average age of starting to wrestling for women wrestlers was 13.67 years old, and the average age for starting to judo was 11.36 years old. There was no significant difference in age, height and body weight among women wrestlers and judoist ($p> 0.05$). There was a significant difference between the sport branch starting age and starting age of losing weight ($p<.001$). In the group of those who continuously lose weight before the competition; 60.08% were in wrestlers, 53.0% in judoist and 57.2% in total in the group. In the group of 36.8% of the athletes declared that they did not lose weight. The athletes of 38.9% who lose weight before the competition were succeeded in the match and 39.9% athletes who didn't lose weight before the competition were also succeeded in the match. While the rate of those who started to lose weight 9 days or more before the competition was 45.5%, the rate of those who started to lose weight 5-8 days ago was 27.3%. There was no significant difference in the days of starting weight loss before the competition compared to the sport branch ($p> .05$). CONCLUSION: Similarities and differences were found in weight loss situations for women wrestlers and judoist. Although, the percentage rate of athletes who succeeded in non-weight loss matches was higher, but they lose weight unconsciously. It has come to the conclusion that both athletes in the two branches should be aware of the weight loss.
- Isik, O., Cicioğlu, H.I., Gul, M., Alpay, C.B. (2017). Development of the Wrestling Competition Analysis Form According to the Latest Competition Rules. *International journal of wrestling science*, 7(1).
- The rules of wrestling competition were changed by United World Wrestling (UWW) before the 2016 Olympic Games. The aim of this study was to develop a wrestling competition analysis form according to the latest wrestling competition rules of UWW for all age categories and styles. We observed and separately analyzed 300 wrestling competitions. Thereafter, we identified the deficiencies, confusions, and defects in the form and made a common decision about variables. Finally, we obtained the revised form. This form provides access to the latest wrestling rules, which will make it easier for researchers working on wrestling competition analysis, as well as helping coaches and managers to record the bouts of their wrestlers in competitions and their opponents. As a result, wrestlers can use this form to decide when, where, and how they applied a technique; from which lateral they applied the technique; and how many points they received. Moreover, the form will help them to obtain permanent results. Thus, the characteristics of wrestlers can be recorded according to the latest wrestling competition rules.
- Işık, Ö., Doğan, İ., Cicioğlu, H. İ., & Yıldırım, İ. (2017). A new approach to Special Judo Fitness Test index: Relative index. *Journal of Human Sciences*, 14(4), 4219-4225. doi:10.14687/jhs.v14i4.5100
- Although judo and wrestling have different rules, these branches are two different Olympic sports branches, partly based on similar basic techniques. For example; the technique called "Ippon-Seoi- Nage" (one shoulder throw) in judo is mechanically the same as the technique called "Arm Throw" in wrestling. The aim of this study was to gain relative special judo fitness test (SJFT) index with a new approach to the SJFT index used in the literature. The maximum number of "arm throw" is required from wrestlers during the tests. The test consists of 3 sets. The sets are 15 sec, 30 sec, and 30 sec, respectively, and rest between the sets is 10 seconds. The heart rate of the wrestlers has recorded at the end of each set of the test and 1 minute after. The wrestlers were classified as the elite and sub-elite group and also as weight classification. Statistical analyses were performed using Mann-Whitney U test and Kruskal Wallis test. There is no statistical difference between elite and sub-elite

female wrestlers according to heart rate, the number of "arm throw", SJFT index, and relative SJFT index. On the other hand, there is a statistical difference in relative SJFT index according to weight classifications. Accordingly, lightweight wrestlers have highest relative SJFT index than the other groups. As a result of this study, there was no difference in the weight categories of the wrestlers according to the SJFT index, whereas there was a difference in the weight categories of the wrestlers according to the relative SJFT index. The use of the relative SJFT index to determine the difference between the weight categories will provide more accurate results for performance evaluation.

Isik, O., & Dogan, I. (2017). Body components changes and depression scores before competitions among elite female wrestlers. *Acta Kinesiologica, 11*(1), 23-27.

Among weight-sports like wrestling where athletes are required to weigh-in before the competitions and their weights are measured; athletes generally lose weight. Athletes who carry out weight loss through sweat room, fluid and food restrictions undergo dehydration. The current study was undertaken to examine body components changes and their depression scores caused by dehydration among the female elite wrestlers. 29 female elite wrestlers who participated in Turkish Inter-University Wrestling Championship were included in the study. Beck's Depression Inventory (BDI) used to determine depression scores of female elite wrestlers; personal information forms that addressed age, height, weight, amount of weight lost before the competition and body components [Tanita BC-418 brand via bioelectrical impedance analysis (BIA)] were administered one hour before weigh-in competition. Data was tested for normality with the Shapiro-Wilk test. The independent Samples T Test was used to compare pairwise group variables that followed a normal distribution. In the current study it has been found statistically significant difference between percentage of body fat, body fat mass, percentage of total body water and depression scores according to weight loss group and non-weight loss group. As a result; it has been found that fat mass is lower and depression scores' is mild degree for female elite wrestlers performing weight loss.

Issurin, V. (2017). Evidence-Based Prerequisites and Precursors of Athletic Talent: A Review. *Sports Medicine, 47*(10), 1993-2010. doi:10.1007/s40279-017-0740-0

Extensive findings related to nature and nurture in determining athletic talent (AT) have been reviewed. Available data demonstrate the important contribution of hereditary factors as well as the crucial importance of environmental prerequisites for identifying and developing AT. Recent publications provide examples of contemporary approaches intended to solve the problem of how to discover and nurture AT. A number of cross-sectional and longitudinal studies highlighted possibilities of revealing a predisposition to certain sports among youthful prospects, but were unable to predict attainment of world-class status. Data pertaining to Olympic champions indicate that their superiority compared with other elite athletes is determined by high intrinsic motivation, determination, dedication, persistence, and creativity. These salient manifestations of personality could be successfully recognized even in the initial stages of their preparation, where exceptionally gifted individuals manifested high learnability and a high rate of athletic improvement. Moreover, future champions were characterized by an exceptional attitude to training and a willingness to perform more voluminous and high-quality training routines. Exceptionally talented athletes in endurance, power, and combat sports attained world-class status after 4-7 years of specialized preparation, accumulating 3000-7000 h of purposeful training. This stands in contradiction to Ericsson's theory of deliberate practice and the 10-year rule. In contrast, Olympic artistic gymnastics champions attained world-class status following an average of 9.7 years of specialized preparation, accumulating an average of 8918 h of specialized training. Apparently, the theory of 10,000 h of deliberate practice and the 10-year rule are selectively applicable to highly coordinative esthetic sports but not to general preparation trends in endurance, power, and combat sports.

Iwai, K., Takahashi, R., Yumoto, K., Nakazato, K. (2017). *Methodological development of a wrestling shuttle test on the mat*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling.", Novi Sad, Serbia.

PURPOSE: Elite wrestlers have high aerobic and anaerobic capacities. They also acquire their sport-specific movements and techniques while wrestling. However, there is no wrestling shuttle test which requires wrestling-specific movements on the wrestling mats. Thus, this study methodologically developed a shuttle test for wrestlers to evaluate their aerobic and anaerobic capacities on the mat while using wrestling-specific movements. A convenient feature of this wrestling shuttle test is its easy administration in the practice room and without extraneous equipment. **METHODS:** Twenty-two Canadian wrestlers participated in this study (15 males and 7 females). We designed a wrestling shuttle test using a concept which includes 4 main standpoints; 1: wrestling-specific movements, 2: the international wrestling rules, 3: on the mat, 4: individuality. The wrestling-specific movements can have many directions depending on the wrestling styles with wrestlers and their opponents. Therefore, we decided that wrestlers should move in four directions by running forward, backward, and side-shuffling steps in both left and rightward directions. As shown in the Figure, the wrestling shuttle test was conducted on the wrestling mat. The length of each shuttle is 4 meters between the center circle and 3 designated points (., ., .) outside the mat circle (passivity zone). This shuttle test involves performing as many shuttle lengths as possible in 3 minutes (incomplete lengths were not recorded). A full cycle of 8 shuttle lengths (right side: lengths 1 to 4, left side: lengths 5 to 8) includes two lengths of each of the four movement directions, and is to be repeated as many times as possible by the wrestler. **RESULTS:** The normal distribution of scores were observed in this study (wrestling shuttle test: $z = 1.042$, p value = 0.228). We also confirmed similar results depended on sex

(males: $z = 0.622$, p value = 0.833, females: $z = 0.790$, p value = 0.561). CONCLUSIONS: This study can suggest that the wrestling shuttle test we developed is an easy and convenient method to conduct measures of aerobic and anaerobic capacities on the wrestling mat

Jensen, A. R., Maciel, R. C., Petrigliano, F. A., Rodriguez, J. P., & Brooks, A. G. (2017). Injuries Sustained by the Mixed Martial Arts Athlete. *Sports Health: A Multidisciplinary Approach*, 9(1), 64-69.

Context: Mixed martial arts (MMA) is rapidly growing in popularity in the United States and abroad. This combat sport joins athletes from a wide variety of martial art disciplines, each with characteristic and distinguishing injury profiles, together in competition. Because of increasing participation by professionals and amateurs alike, injuries sustained by MMA athletes have been on the rise. Evidence Acquisition: A review of relevant publications using the search term mixed martial arts and each of its component combat sports (eg, Muay Thai, Brazilian jiu-jitsu) from 1980 through 2015 was completed using PubMed and Google Scholar. Study Design: Clinical review. Level of Evidence: Level 5. Results: The majority of studies on MMA injuries evaluate those sustained during competition, which range in incidence from 22.9 to 28.6 per 100 fight-participations. Striking-predominant disciplines such as boxing, karate, and Muay Thai have high rates of head and facial injuries, whereas submission-predominant disciplines such as Brazilian jiu-jitsu, judo, and wrestling have high rates of joint injuries. Conclusion: Numerous studies have evaluated injuries in athletes who participate in MMA and its component disciplines during competition but much remains to be discovered about injuries sustained during training and in specific patient populations such as adolescents and women.

Johnson, B. K., & Comstock, R. D. (2017). Epidemiology of Chest, Rib, Thoracic Spine, and Abdomen Injuries Among United States High School Athletes, 2005/06 to 2013/14. *Clinical journal of sport medicine*, 27(4), 388-393.

Objective: Describe chest and abdominal injury epidemiology among US high school athletes. Design: Retrospective analysis of longitudinal surveillance data. Setting: Injury data from 2005/06 to 2013/14 academic years were collected using an internet-based surveillance system. Participants: A large sample of US high schools. Assessment of Risk Factors: Injuries sustained as a function of sport. Main Outcome Measures: Chest, rib, thoracic spine, and abdominal injuries sustained during high school athletic events. Results: Overall 1487 chest, rib, thoracic spine, and abdominal injuries occurred during 30 415 179 athletic exposures (AEs); an injury rate of 4.9 injuries per 100 000 AEs. Over half (56.8%) of injured athletes were evaluated by another medical provider in addition to the athletic trainer, and 34 injuries (2.3%) required surgery. Diagnostic techniques, including x-ray, magnetic resonance imaging or computed tomography were used in 729 (49.0%) injuries. The injury rate was higher in boys' (6.8) than girls' (2.0) sports [rate ratio (RR), 3.43; 95% CI, 3.04-4.10]. Football (47.7%) accounted for the highest proportion of injuries followed by wrestling (18.5%), boys' soccer (4.6%), and girls' soccer (3.7%). The rate of injury was higher in competition than practice, (RR, 2.86; 95% CI, 2.59-3.23). Only 57.7% of injured athletes were able to return to play within 1 week. Conclusions: Chest and abdominal injuries in high school sports although relatively rare, can result in loss of playing time and frequently prompt medical evaluation. Thus, they present a physical and economic burden. To optimize prevention, further studies can focus on subgroup risk factor identification to drive development of targeted prevention strategies.

Jówko, E., Gierczuk, D., Cieśliński, I., & Kotowska, J. (2017). SOD2 gene polymorphism and response of oxidative stress parameters in young wrestlers to a three-month training. *Free Radical Research*, 51(5), 506-516. doi:10.1080/10715762.2017.1327716

The aim of the study was to analyse the effect of Val 16Ala polymorphism in SOD2 gene on oxidative stress parameters and lipid profile of the blood during a three-month wrestling training. The study included 53 Polish young wrestlers. Blood samples were collected at the beginning of the programme and following three months of the training. The list of analysed parameters included erythrocyte and serum activities of superoxide dismutase (SOD), whole blood glutathione peroxidase (GPx) activity, total glutathione (tGSH) level, concentration of lipid hydroperoxides (LHs), total antioxidant capacity (TAC) and creatine kinase (CK) activity in the serum, as well as lipid profile parameters: triglycerides (TG), total cholesterol (TC), high-density (HDL-C), and low-density lipoprotein cholesterol (LDL-C). Three-month training resulted in a decrease in CK activity, an increase in serum SOD activity, as well as in unfavourable changes in serum lipid profile: an increase in TC, LDL-C, and TG, and a decrease in HDL-C. Aside from CK activity, all these changes seemed to be associated with presence of Val allele. Prior to the training programme, subjects with Ala/Ala genotype presented with lower levels of LHs, lower whole blood GPx activity, and lower serum concentrations of TC than the individuals with Ala/Val genotype. Both prior to and after three-month training, higher levels of tGSH were observed in Val/Val genotype as compared to Ala/Val genotype carriers. Moreover, multiple regression analysis demonstrated that SOD2 genotype was a significant predictor of pre-training whole blood GPx activity and erythrocyte SOD activity (Val/Val > Ala/Val > Ala/Ala). Altogether, these findings suggest that Val 16Ala polymorphism in SOD2 gene contributes to individual variability in oxidative stress status and lipid profile of the blood in young wrestlers, and may modulate biochemical response to training.

Julio, U. F., Panissa, V. L. G., Esteves, J. V., Cury, R. L., Agostinho, M. F., & Franchini, E. (2017). Energy-System Contributions to Simulated Judo Matches. *International journal of sports physiology and performance*, 12(5), 676-683. doi:10.1123/ijspp.2015-0750

Purpose: To estimate the contribution of the 3 energy systems to simulated judo matches. Methods: Twelve judo athletes (18 y, 175.1 +/- 5.3 cm, 74.3 +/- 10.5 kg, 11.7% +/- 1.5% body fat, 8 +/- 2 y of practice) performed 5 combats with different durations (1, 2, 3, 4, and 5 min), against the same opponent, on different days and blinded to the duration. The estimated energy contributions for the oxidative, glycolytic, and ATP-PCr systems were calculated based on oxygen uptake (VO₂) during activity, Delta of lactate, and the fast phase of excess VO₂, respectively. Analysis of mixed models for repeated measures was used to compare the contribution of the 3 energy systems and different durations of judo matches, followed by a post hoc Bonferroni test. Results: The oxidative system's contribution (70%) was higher than those of the glycolytic (8%; P < .001) and ATP-PCr (21%; P < .001) energy systems (in all durations), and the ATP-PCr contribution was higher than that of the glycolytic energy system (up to 3 min). In addition, during the match there was an increase in the oxidative (from 50% to 81%; P < .001), a decrease in the ATP-PCr (from 40% to 12%; P < .001), and maintenance of the glycolytic contributions (between 6% and 10%). Conclusions: There is a predominance of the oxidative system to supply the energy cost of judo matches from the first minute of combat up to the end, compared with the anaerobic systems.

Kajaia, T., Maskhulia, L., Chelidze, K., Akhalkatsi, V., & Kakhbrishvili, Z. (2017). The effects of non-functional overreaching and overtraining on autonomic nervous system function in highly trained athletes. *Georgian medical news* (264), 97-103. Aim of the study was to compare the ANS functioning, as measured by heart rate variability (HRV), in athletes with non-functional overreaching (NFO) and overtraining syndrome (OTS) and in athletes without NFO/OTS. In 43 athletes with NFO/OTS, 40 athletes without NFO/OTS, as well as in 35 sedentary subjects the ANS function was evaluated with the Autonomic Balance Test, based on the HRV analysis of resting heart rate recordings. Results of the study show lower HRV and lower vagal influence along with increased sympathetic cardiovascular control in athletes with non-functional overreaching and particularly in athletes with overtraining, than in highly trained athletes without NFO/OTS. "Stress Response" in athletes with NFO, as well as in some athletes with OTS, showing sympathetic dominance, considered as a sign of physical or mental fatigue and chronic stress, whereas "Total Autonomic Dystonia" in most of the athletes with OTS (67%) reflects more advanced stage of maladaptation associated with depressed regulatory function of the ANS, both sympathetic, as well as vagal influences. Most frequently NFO and OTS were seen in wrestling, which needs further investigation and regular medical monitoring. Thus, results of the study show progression of autonomic imbalance and depression of regulatory function of the autonomic nervous system in athletes with OTS. The cardiac autonomic imbalance observed in overtrained athletes implies changes in HRV and therefore would consider that heart rate variability may provide useful information in detection of overtraining in athletes and can be a valuable adjacent tool for optimising athlete's training program as well as for timely diagnosis and prevention of progression of NFO/OTS.

Kajmovic, H., Rado, I., Kapur, A., Mekic, A., Kapo, S. (2017). *Differences in performed actions of winners and defeated female cadet wrestlers in a standing position*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad. PURPOSE: Wrestling is very intense polystructural acyclic activity in which female wrestlers have the possibility to win or be defeated based on their current performances. For this reasons, athletes and coaches must understand the demands of wrestling in competition as well as the significance of the information collected by notation analysis at the competition, which are later analyzed in purpose of improving wrestling performances on a higher, better level. The purpose of this research is determining differences in performed wrestling technical actions of winners (W) and defeated (D) female cadet wrestlers in a standing position at European cadet championship for male and female cadets. METHODS: The sample of subjects consists n=267 throwing technique from which the winners achieved n=203, and defeated contestants n=67 throwing techniques. The sample of variables are all from standing throwing techniques which were successfully applied during the fight, and the judges, based on that efficiency, gave adequate points. The data were collected based on notation analysis of videos at European championship for cadets, held in Sarajevo (Bosnia and Herzegovina) in 2010. in all weight categories for cadets. In order to identify differences in accomplished performances between winners and defeated contestants, the Wilcoxon rank test was used, at the level of statistical significance of p 0.05. RESULTS: The results of Wilcoxon rank test showed that the winners dominate in comparison to defeated wrestlers in the following techniques in the standing position: Take down (p<.001) W=70,9% - D=29,1%, Push out techniques (p=.013) W=84,6% - D=15,4%, Throw with both legs locked (p=.002) W=92,3% - L=7,7%, A Fireman's carry (p=.011) W=90,0% - D=10,0%, Pulling down (p=.014) W=100,0% - D=0,0%, Side throws (p<.001) W=99,4% - D=5,6%, while in counterattack techniques in standing position (p=.157) and Shoulder throw with no significant difference (p=.157). CONCLUSION: The value of the data collected indicate that, in cadet phase on this level of competition, individual wrestling techniques significantly dominate over other wrestling techniques. By far the most effective techniques, used by winners and defeated contestants, is Take down technique, and after it, Side throws. It is clear that the contestant's inexperience, technical excellence and fitness levels contributed to the differences between winners and defeated contestants. Based on the results, this type of collecting data about performance levels is repeatable, and based on this, coaches can design new programs of training that will improve the performance of contestants, both in attack and in defense.

Karadag, M. (2017). Compare the Values of Blood Lactate and Heart Rate of Kickboxers during Kickboxing Matches. *Journal of Education and Training Studies*, 5(7), 13-19.

The aim of this study was to compare the values of heart rate (HR) and blood lactate (BL) of kickboxers during kickboxing match. This study was conducted with the participation of 18 male and 16 female sportsman in Turkish Kickboxing championship, an organization of Turkish Kickboxing Federation. After the participant athletes read and signed informed voluntary consent form (BGOF) prepared for them, the measurements were collected. While no significant difference was found between ages, pre-match HR, post-match HR, pre and post-match BL of male and female Kickboxers, a significant difference was statistically found between the height ($P \leq 0.05$) and body weights ($P \leq 0.01$) of athletes. Age distribution of athletes was determined as 14-23 and mean age distribution was determined as 17.03 ± 2.41 . HR pressures of athletes differs according to pre-match and post-match periods ($P \leq 0.001$). As HR frequencies increase by 29.4% according to pre-match HR regardless of the gender, this increase was determined as 31.4% for male athletes and 27.2% for female athletes. While post-match BLs of athletes increase by 4.02 times compared to pre-match regardless of the gender, this increase was determined as 4.20 for male athletes and 3.82 for female athletes. Kickboxing is a combat sport which has high intensity of anaerobic physical fitness. Matches and rounds for HR and BL concentrations show the importance of the aerobic metabolism in kickboxing. However, the significant rise of HR and BL during simulated match indicates that the anaerobic metabolism is also important in kickboxing.

Karnincic, H., Baic, M., Sprem, D. (2017). *Optimal age to begin with Greco-Roman wrestling and reach peak performance trends in cases of world-class medal winners of various weight groups*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.

When to start doing Greco-Roman wrestling? How many years of experience are needed to accomplish world-class standard and achievements? At which age do wrestlers nowadays win their world championship or Olympic medals? What age-related trends can be observed in wrestlers of different weight groups? This study explored all these questions. PURPOSE: The aim of the research was to determine differences between weight groups in age-related parameters (beginning age, wrestling experience, and peak performance age) of world-class top-level wrestlers and to analyse the revealed trends. METHODS: The sample of entities ($N=299$) comprised wrestlers who won their first World Championship or Olympic Games' medals in the period 2002-2015. The sample of variables consisted of three age-related parameters: Beginning, Experience and Peak. The variables were processed by descriptive statistics. The differences between weight groups were analysed using the Kruskal-Wallis test and trends were added to graphical representation to perform analysis across years. RESULTS: Olympic Games or world championship (OG/WCh) medal winners started their wrestling training at the age of 10.51 ± 2.98 years. They had been training for 15.09 ± 4.28 years before they won their first medal at the age of 25.55 ± 3.10 years. The middleweight wrestlers started to train wrestling significantly earlier ($p < 0.01$), than their lightweight counterparts and most heavyweight counterparts and they acquired more wrestling experience before the first OG/WCh medal winning. CONCLUSIONS: The wrestling beginning age demonstrated a decreasing trend across the years of the observed period, so caution is advisable as regards early specialization. A rising trend in training experience is a consequence of a declining trend in wrestling beginning age. Analysis across weight groups indicated, although not pronouncedly, that lightweight- and heavyweight-group wrestlers may begin to train at later age and accomplish outstanding achievements with less experience. This study provides a precise set of information to wrestling coaches on when to include their trainees in wrestling, for how long one needs to wrestle before winning the first medal and at which age we can expect a wrestler to win his/her first major competition (WCh or Olympic) medal in accordance with the respective weight groups.

Kavoura, A., Kokkonen, M., Chroni, S. A., & Ryba, T. V. (2017). 'Some women are born fighters': Discursive constructions of a fighter's identity by female Finnish judo athletes. *Sex Roles*. doi:10.1007/s11199-017-0869-1

Martial arts and combat sports have been traditionally associated with masculinity, and a range of contradictory meanings have been attached to women's engagement and experiences. The present study draws on cultural praxis and feminist poststructuralist frameworks to explore how female martial artists are subjectified to dominant cultural discourses surrounding fighting and competition. Interviews with nine female judoka (judo athletes) were gathered in Finland and analyzed using Foucauldian Discourse Analysis (FDA). The FDA revealed that in female judoka talk, judo was constructed as a sport for all, but also as a male domain and a manly sport with fighting and competition as innate masculine qualities that are not learned. Two sets of wider, competing discourses provided the dominant structure for participants' constructions of judo: (a) a mass sport discourse versus an elite sport discourse and (b) a gender equality discourse versus a female biological inferiority discourse. Drawing on this discursive context and in seeking to make sense of their experiences, participants constructed a 'naturally born fighter' identity. Although this might be an empowering identity for female judoka, it does not advance the agenda of gender equity in martial arts because it constructs 'ordinary' women as biologically incapable of competitive judo. Our findings reveal that even in the relatively egalitarian culture of Finland, gender hierarchies persist in judo and that it is only by disrupting prevalent constructions of fighting and competitiveness as masculine that progress toward gender equity can be made.

Kay, M. C., Register-Mihalik, J. K., Gray, A. D., Djoko, A., Dompier, T. P., & Kerr, Z. Y. (2017). The Epidemiology of Severe Injuries Sustained by National Collegiate Athletic Association Student-Athletes, 2009-2010 Through 2014-2015. *Journal of Athletic Training (Allen Press)*, 52(2), 117-128.

Context: Few researchers have described the incidence of the most severe injuries sustained by student-athletes at the collegiate level. Objective: To describe the epidemiology of severe injuries within 25 National Collegiate Athletic Association

(NCAA) sports in the 2009-2010 through 2014-2015 academic years. Design: Descriptive epidemiology study. Setting: Aggregate injury and exposure data from 25 NCAA sports. Patients or other participants: Collegiate student-athletes in the 2009-2010 through 2014-2015 academic years. Main outcome measure(s): Injury data from the NCAA Injury Surveillance Program were analyzed. A severe injury (1) occurred during a sanctioned competition or practice, (2) required medical attention by an athletic trainer or physician, and (3) resulted in at least 21 days lost from sport activity or a premature end to the sport season. Injury counts, proportions, rates per 1000 athlete-exposures (AEs), rate ratios (RRs), and injury proportion ratios were reported with 95% confidence intervals (CIs). Results: A total of 3183 severe injuries were reported, for an injury rate of 0.64/1000 AEs. Wrestling had the highest severe injury rate (1.73/1000 AEs), followed by women's gymnastics (1.40/1000 AEs) and football (0.97/1000 AEs). Overall, the severe injury rate was higher in competition than in practice (RR = 4.25, 95% CI = 3.97, 4.56). Most severe injuries were reported during the regular season (69.3%, n = 2206); however, severe injury rates did not differ between the preseason and regular season (RR = 0.98, 95% CI = 0.91, 1.06). Common severely injured body parts were the knee (32.9%, n = 1047), lower leg/ankle/foot (22.5%, n = 715), and head/face/neck (11.2%, n = 358). Common severe injury diagnoses were sprains (32.9%, n = 1048), strains (16.9%, n = 538), and fractures (14.4%, n = 458). Common severe injury mechanisms were player contact (25.1%, n = 800), noncontact (25.1%, n = 800), and surface contact (12.0%, n = 383). Conclusions: Severe injuries occurred across many sports and by numerous mechanisms. By identifying these sport-specific patterns, clinicians' efforts can be tailored toward improving injury-prevention strategies and health outcomes.

Kaynar, O., Engin, R. I., Dagdeviren, F., Yilmaz, M., Ozkan, B., & Ozturk, S. (2017). Investigation of skin infection frequency in Turkish wrestlers. *Turkderm-Archives of the Turkish Dermatology and Venerology*, 51(3), 84-87. doi:10.4274/turkderm.81231
Background and Design: The aim of this study was to determine the frequency of dermatological infections among Turkish wrestlers. Materials and Methods: We included 202 wrestlers from different regions of Turkey who volunteered to participate in the study. The "Athlete Biography and Dermatologic Examination Findings" survey that was designed before the research was completed during dermatological examination and dermatologic findings of each athlete were evaluated. Results: During the physical examination of 202 Turkish wrestlers, 115 (57%) of participants were observed to have skin infection while no skin infection was found in 87 (43%). It has been detected that these infections were fungal, bacterial and viral in 31%, 18% and 8% of patients, respectively. The rates of infections were 25 (12%), 28 (14%), 15 (8%), 12 (6%), 12 (6%), 8 (4%), 6 (3%), 5 (2%), 2 (1%), and 2 (1%) for tinea corporis, tinea pedis, erythrasma, folliculitis, wart, onychomycosis, paronychia, herpes, impetigo, and tinea versicolor, respectively. Conclusion: In this study, it was found that Turkish wrestlers had skin infections, these infections were not as common as reported in the literature. It can be understood that early diagnosis and treatment is very important in reducing the prevalence of these infections in wrestlers.

Kerr, Z. Y., Cortes, N., Caswell, A. M., Ambegaonkar, J. P., Hallsmith, K. R., Milbert, A. F., & Caswell, S. V. (2017). Concussion Rates in U.S. Middle School Athletes, 2015-2016 School Year. *American Journal of Preventive Medicine*. doi:10.1016/j.amepre.2017.05.017
INTRODUCTION: Concussion incidence estimates in middle school sports settings are limited. This study examines concussion incidence in nine U.S. middle schools during the 2015-2016 school year. METHODS: Concussion data originated from nine public middle schools in Prince William County, Virginia, during the 2015-2016 school year. Certified athletic trainers collected concussion and athlete exposure (AE) data in school-sanctioned games and practices in boys' baseball, basketball, football, soccer, track, and wrestling; and girls' basketball, cheerleading, soccer, softball, track, and volleyball. Athletic trainers also acquired data on non-school sanctioned sport concussions. In 2017, concussion rates were calculated per 1,000 AEs. Injury rate ratios with 95% CIs compared rates between games and practices and by sex. RESULTS: Overall, 73 concussions were reported, of which 21.9% were from non-school sanctioned sport settings. The 57 remaining game and practice concussions were reported during 76,384 AEs, for a concussion rate of 0.75/1,000 AEs. Football had the highest concussion rate (2.61/1,000 AEs). Concussion rates were higher in games versus practices (injury rate ratio=1.83, 95% CI=1.06, 3.15), and in girls versus boys in sex-comparable sports, i.e., baseball/softball, basketball, soccer, and track (injury rate ratio=3.73, 95% CI=1.24, 11.23). CONCLUSIONS: Current findings parallel those found in high school and college sports settings in that higher concussion rates were reported in girls and competitions. However, concussion rates exceeded those recently reported in high school and youth league settings, highlighting the need for continued research in the middle school sports setting. Given that one in five concussions were from non-school sanctioned sport settings, prevention efforts in middle school sports settings should consider sport and non-sport at-risk exposure.

Kerr, Z. Y., Lynall, R. C., Roos, K. G., Dalton, S. L., Djoko, A., & Dompier, T. P. (2017). Descriptive Epidemiology of Non-Time-Loss Injuries in Collegiate and High School Student-Athletes. *Journal of Athletic Training (Allen Press)*, 52(5), 446-456. doi:10.4085/1062-6050-52.2.15
Context: Research on non-time-loss (NTL) injuries, which result in less than 24 hours of restriction from participation, is limited. Objective: To describe the epidemiology of NTL injuries among collegiate and high school student-athletes. Design: Descriptive epidemiology study. Setting: Aggregate injury and exposure data collected from a convenience sample of National College Athletic Association varsity teams and 147 high schools in 26 states. Patients or Other Participants: Collegiate and high school student-athletes participating in men's and boys' baseball, basketball, football, lacrosse, soccer, and wrestling and women's

and girls' basketball, field hockey, lacrosse, soccer, softball, and volleyball during the 2009-2010 through 2013-2014 and the 2011-2012 through 2013-2014 academic years, respectively, participated. Collegiate student-athletes participating in men's and women's ice hockey were also included. Main Outcome Measure(s): Injury data from the National Collegiate Athletic Association Injury Surveillance Program and the National Athletic Treatment, Injury and Outcomes Network were analyzed. Injury counts, rates per 1000 athlete-exposures (AEs), and rate ratios were reported with 95% confidence intervals (CIs). Results: A total of 11 899 and 30 122 NTL injuries were reported in collegiate and high school student-athletes, respectively. The proportion of NTL injuries in high school studentathletes (80.3%) was 1.61 times greater than that of collegiate student-athletes (49.9%; 95% CI = 1.59, 1.63). The NTL injury rate in high school student-athletes (8.75/1000 athlete-exposures [AEs]) was 2.18 times greater than that of collegiate student-athletes (4.02/1000 AEs; 95% CI = 2.13, 2.22). Men's ice hockey (5.27/1000 AEs) and boys' football (11.94/1000 AEs) had the highest NTL injury rates among collegiate and high school athletes, respectively. Commonly injured body parts in collegiate and high school student-athletes were the hip/thigh/upper leg (17.5%) and hand/wrist (18.2%), respectively. At both levels, contusions, sprains, and strains were the most frequent diagnoses. Contact with another player was the most cited injury mechanism (college = 38.0%, high school = 46.3%). Conclusions: Non-time-loss injuries compose large proportions of collegiate and high school sports injuries. However, the NTL injury rate was higher in high school than in collegiate student-athletes. Tracking NTL injuries will help to better describe the breadth of injuries sustained by athletes and managed by athletic trainers.

Kerr, Z. Y., Roos, K. G., Djoko, A., Dalton, S. L., Broglio, S. P., Marshall, S. W., & Dompier, T. P. (2017). Epidemiologic Measures for Quantifying the Incidence of Concussion in National Collegiate Athletic Association Sports. *Journal of Athletic Training (Allen Press)*, 52(3), 167-174.

Context: Injury rates compare the relative frequency of sport-related concussions across groups. However, they may not be intuitive to policy makers, parents, or coaches in understanding the likelihood of concussion. Objective: To describe 4 measures of incidence (athletebased rate, athlete-based risk, team-based rate, and team-based risk) during the 2011-2012 through 2014-2015 academic years. Design: Descriptive epidemiology study. Setting: Aggregate injury and exposure data collected from the National Collegiate Athletic Association Injury Surveillance Program in 13 sports (men's baseball, basketball, football, ice hockey, lacrosse, soccer, and wrestling and women's basketball, ice hockey, lacrosse, soccer, softball, and volleyball). Patients or Other Participants: Collegiate student-athletes. Main Outcome Measure(s): Sport-related concussion data from the National Collegiate Athletic Association Injury Surveillance Program during the 2011-2012 through 2014-2015 academic years were analyzed. We calculated concussion rates per 1000 athlete-exposures (AEs), concussion risk, average number of concussions per team, and percentage of teams with at least 1 concussion. Results: During the 2011-2012 through 2014-2015 academic years, 1485 concussions were sustained by 1410 student-athletes across 13 sports. Concussion rates ranged from 0.09/1000 AEs in men's baseball to 0.89/1000 AEs in men's wrestling. Concussion risk ranged from 0.74% in men's baseball to 7.92% in men's wrestling. The average 6 SD number of concussions per team ranged from 0.25 6 0.43 in men's baseball to 5.63 6 5.36 in men's football. The percentage of teams with a concussion ranged from 24.5% in men's baseball to 80.6% in men's football. Conclusions: Although men's wrestling had a higher concussion rate and risk, men's football had the largest average number of concussions per team and the largest percentage of teams with at least 1 concussion. The risk of concussion, average number of concussions per team, and percentage of teams with concussions may be more intuitive measures of incidence for decision makers. Calculating these additional measures is feasible within existing injury surveillance programs, and this method can be applied to other injury types.

Keshavarz, M., Bayati, M., Farzad, B., Dakhili, A., & Agha-Alinejad, H. (2017). The Second to Fourth Digit Ratio in Elite and Non-Elite Greco-Roman Wrestlers. *Journal of Human Kinetics*, 60(1), 145-151.

A low second-to-fourth digit ratio (2D:4D) has been reported to correlate with high performance and athletic potential of an individual in sport. It has been suggested that 2D:4D is a relatively weak predictor of strength and a stronger predictor of efficiency in aerobic exercise. Comparing extreme groups on a continuum of sports performance requiring high power (physical strength) output would be helpful to resolve this issue. Therefore, the purpose of the present study was to compare the 2D:4D ratio of world-class elite Greco-Roman wrestlers (n = 10) taking part in Olympic fitness camps in 2013 with the 2D:4D ratio of non-elite collegiate wrestlers (n = 20), and age-matched sedentary males (n = 40). The 2D:4D ratios of elite wrestlers were lower compared to non-elite athletes (p < 0.01, right hand d = 1.70, left hand d = 1.67) and the control group (p < 0.0001, right hand d = 3.16, left hand d = 2.00). No significant differences were noted among the groups for right - left 2D:4D. We concluded that 2D:4D may discriminate between non-elite and world-class wrestlers. We also suggest that a low 2D:4D ratio could be linked to performance potential in wrestlers. As such, 2D:4D may provide additional information, which is valuable in determining the potential athleticism of an individual, when it is used in conjunction with other measures.

Khurana, R. K. (2017). Initial orthostatic and non-orthostatic hypotension in wrestler's syncope. *Clinical Autonomic Research*, 27(6), 423-426. doi:10.1007/s10286-017-0476-9 We present a case of wrestler's syncope associated with initial hypotension in response to orthostatic and non-orthostatic sympathoexcitatory stimuli. A 16-year-old male presented with recurrent syncope during wrestling for 5 years. In these episodes he stopped wrestling and had a blank stare, vertigo, black spots in vision, heart racing, sweating, muffled sounds, and exhaustion. He denied fainting, tongue bite, or sphincter incontinence, but he was pale

and amnestic and felt wobbly transiently after the episode. Fludrocortisone treatment for 2 years was without benefit. Unrelated to syncope, he experienced 1 h episodes of moderate occipital headache with photophobia. Fludrocortisone aggravated his headache. He had constant moderate fatigue for 1 year.

- Kikuchi, N., Fuku, N., Matsumoto, R., Matsumoto, S., Murakami, H., Miyachi, M., & Nakazato, K. (2017). The Association Between MCT1 T1470A Polymorphism and Power-Oriented Athletic Performance. *International Journal of Sports Medicine*, 38(1), 76-80. doi:10.1055/s-0042-117113
- The purpose of this study was to investigate the effects of the MCT1 T1470A polymorphism (rs1049434) on power-oriented performance and lactate concentration during or after cycling sprints in Japanese wrestlers. Participants (199 wrestlers and 649 controls) were genotyped for the MCT1 T1470A genotype (rs1049434) using the TaqMan (R) Assay. All wrestlers were international (n = 77) or national (n = 122) level athletes. Among them, 46 wrestlers performed 2 anaerobic performance tests, a 30-s Wingate Anaerobic test (WAnT) and a series of 10 maximal effort 10-s sprints on a cycle ergometer. Blood lactate levels were measured before, during, and after the tests. In the A-allele recessive model (AA vs. TA + TT), the frequency of the AA genotype was significantly higher in all wrestlers than in controls (p = 0.037). Wrestlers with AA genotype had lower blood lactate concentrations than those with TA + TT genotype at 10 min after the WAnT and following the 5th and the final set of repeated cycling sprints (p < 0.05). The AA genotype of the MCT1 T1470A polymorphism is over-represented in wrestlers compared with controls and is associated with lower blood lactate concentrations after 30-s WAnT and during intermittent sprint tests in Japanese wrestlers.
- Kim, J., & 이진택. (2017). Mediation Effects of Ego-Resilience on the Relationships between Coach-Athlets Behavior Fit and Exercise Burnout in Middle and High School Wrestling Athletes. [중·고등부 레슬링선수의 코치-선수 행동부합과 운동탈진의 관계에서 자아탄력성의 매개효과]. *The Korean Society of Sports Science*, 26(1), 361-371.
- The purpose of this study was to identify the relationship model among Mediation Effects of Ego-Resilience on the Coach-Athlets Behavior Fit, Exercise Burnout, in Middle and High School Wrestling Athletes. To achieve the purpose, 111 subjects from middle and high school Korea Wrestling Association. Analysis of the collected material was subjected to the Frequency analysis, reliability analysis, correlation, using AMOS 18 was carried out confirmatory factor analysis, structural equation modeling analysis. The significance of all analyzes p < .05. The following results were obtained: Firstly, Coach-Athlets Behavior Fit has a positive effect on the Ego-Resilience in wrestlers. Secondly, it showed that Coach-Athlets Behavior Fit of the wrestler does not affect the Exercise Burnout. Thirdly, Ego-Resilience has a Negative effect on the Exercise Burnout in wrestlers. Finally, relationships among Coach-Athlets Behavior Fit, Exercise Burnout and Ego-Resilience of wrestler were the causal relation, also role of Ego-Resilience was complete medication variables.
- Kim, S., Kleimeyer, J. P., Ahmed, M. A., Avins, A. L., Fredericson, M., Dragoo, J. L., & Ioannidis, J. P. A. (2017). A Genetic Marker Associated with Shoulder Dislocation. *International Journal of Sports Medicine*, 38(7), 508-514. doi:10.1055/s-0043-106190
- Shoulder dislocations are common shoulder injuries associated with athletic activity in contact sports, such as football, rugby, wrestling, and hockey. Identifying genetic loci associated with shoulder dislocation could shed light on underlying mechanisms for injury and identify predictive genetic markers. To identify DNA polymorphisms associated with shoulder dislocation, a genome-wide association screen was performed using publically available data from the Research Program in Genes, Environment and Health including 662 cases of shoulder dislocation and 82 602 controls from the European ancestry group. rs12913965 showed an association with shoulder dislocation at genome-wide significance (p = 9.7 x 10⁻⁹; odds ratio = 1.6) from the European ancestry group. Individuals carrying one copy of the risk allele (T) at rs12913965 showed a 69% increased risk for shoulder dislocation in our cohort. rs12913965 is located within an intron of the TICRR gene, which encodes TOPBP1 interacting checkpoint and replication regulator involved in the cell cycle. rs12913965 is also associated with changes in expression of the ISG20 gene, which encodes an antiviral nuclease induced by interferons. This genetic marker may one day be used to identify athletes with a higher genetic risk for shoulder dislocation. It will be important to replicate this finding in future studies.
- Knox, C. (2017). Review and Commentary of the Nutritional Recommendations, Weight Management Regulations, Weight Management Practices, and the Potential of Disordered Eating Patterns in High School Age Wrestlers. *Sport Journal*, 1-1.
- The purpose of this article is to review the nutritional recommendations, the weight management practices, and the weight management regulations of high school wrestlers. Serving as a commentary on how these influences coupled with the perceived demand for lean body composition for better performance can relate to disordered eating patterns in high school wrestlers. Wrestling creates a high caloric demand while at the same time wrestlers practice restrictive dietary behaviors. Extreme weight loss behaviors performed by wrestlers have been observed. Nutritional recommendations are primarily made by athletic coaches who are not properly trained in nutrition and weight management. This can lead to the acceptance by the wrestler to practice poor behaviors related to food and nutrition. There is a need to properly evaluate and educate the coaches and athletes on nutrition, and weight management. Such education is necessary for the health of the athlete as they progress through the season, and through growth and development.

Kons, R. L., Da Silva Athayde, M. S., Da Silva Junior, J. N., Da Silva Tavares, W., & Detanico, D. (2017). Vertical jump performance in judo and Brazilian jiu-jitsu athletes: an approach with different training levels. / Wyniki skoków pionowych zawodników judo i brazylijskiego jiu-jitsu: w ujęciu z różnymi poziomami szkoleniowymi. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(4), 25-31.

Background. Judo and Brazilian jiu-jitsu (BJJ) are grappling sports, in which the athletes of both modalities require a combination of powerful actions in the upper and lower limbs. In the lower limbs, power actions are observed in several judo throwing techniques, and the guard passes, sweeps, takedowns in the BJJ matches. Aim. To compare the kinetic parameters of vertical jump performance between judo and BJJ athletes, and to compare these parameters between novices and advanced athletes. Methods. Twenty judo male athletes (twelve novices and eight advanced) and twenty male BJJ athletes (twelve novices and eight advanced) participated in this study. They performed a countermovement jump (CMJ) on a force platform. The following variables were analyzed: jump height, mean power, peak power, maximum force, and peak velocity. An independent samples t-test was used with the level of significance set at $p \leq 0.05$ and the effect size was calculated to verify the effect magnitude. Results. The main results showed that only peak velocity was higher in judo than BJJ athletes ($p = 0.02$). Also, advanced BJJ athletes showed higher peak velocity ($p = 0.03$) and jump height ($p = 0.05$) than novice athletes. Advanced judokas presented higher peak velocity ($p = 0.03$) and maximum force than novice athletes ($p = 0.02$). Conclusions: We conclude that judo athletes are able to apply higher velocity during the jump take-off compared to BJJ athletes. In general, advanced athletes in both combat sports seem to present higher performance in CMJ parameters related to force and velocity.

Kontro, T. K., Sarna, S., Kaprio, J., & Kujala, U. M. (2017). Use of Alcohol and Alcohol-Related Morbidity in Finnish Former Elite Athletes. *Medicine and science in sports and exercise*, 49(3), 492-499. doi:10.1249/mss.0000000000001137

Introduction: The effect of a history of competitive sports on later use of alcohol and occurrence of alcohol-related diseases is poorly known. We investigated how a history of elite level sports was associated with alcohol consumption in middle-age and with alcohol-related morbidity and mortality. Methods: The occurrence of alcohol-related diseases and deaths were followed using national registers from 1970 to 2008 among Finnish male former elite athletes ($n = 2202$) and matched controls ($n = 1403$) alive in 1970 (mean age = 45.1 yr). Hazard ratios were calculated by Cox proportional hazards model. In 1985, surviving participants questionnaire-reported their alcohol consumption and engagement in physical activity/sports. Results: The risk of any alcohol-related diseases or deaths did not differ between former athletes and controls (hazard ratio = 0.93, 95% confidence interval [CI] = 0.73-1.20, $P = 0.59$), although the risk was higher among both combat sports athletes and weightlifters compared with endurance sports athletes, shooters or jumpers, and hurdlers ($P < 0.05$). In 1985, athletes consumed more alcohol (417 g-month^{-1} , 95% CI = 386-447) compared with controls (397 g-month^{-1} , 95% CI = 355-441) ($P < 0.05$). Consumption was lower among endurance sports athletes than among controls ($P < 0.05$). Team sports athletes consumed more alcohol ($P < 0.05$), especially beer ($P < 0.01$), compared with other athletes and controls. Athletes no longer engaged in leisure-time sports consumed more alcohol than those who continued to be physically active ($P < 0.05$). Conclusions: Overall, former athletes reported higher alcohol consumption than controls. There was no difference in alcohol-related morbidity, but the risk varied between different sports groups. Alcohol consumption after top sports career was greater if participation in leisure-time sports was discontinued.

Korobeynikov, G., Korobeinikova, L., Mytskan, B., Chernozub, A., & Cynarski, W. J. (2017). Information processing and emotional response in elite athletes. / Przetwarzanie informacji i emocji elity sportowców. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(2), 41-50.

Purpose. The problem of visual perception and information processing is very real for both sport and professional activities. The performance of motor activity mostly occurs where there are time pressures and an increase in nervous emotion and physical tension. Methods. The role of visual perception in information processing and its connection to emotions in elite athletes were studied. 19 elite athletes, Greco-Roman wrestlers, aged 19-22 were examined. The sequence of the study method was: simple visual-movement reaction; reaction to a moving object; speed of perception; scale of emotional excitability. Results. The results obtained indicate significant links between anger and visual perception in elite athletes. It is likely that emotional factors such as anger are a hindrance to athletes' concentration on the object of the activity. This results in ineffective information processing and leads to a deterioration in visual perception. Conclusions. The study shows that anger is not a motivational factor in sport activity. Anger as an affective emotion, is a negative characteristic and affects the athletes' general functional state.

Korobeynikov G.V., K. L. G., Romanyuk L.V., Dakal N.A., Danko G.V. (2017). Relationship of psychophysiological characteristics with different levels of motivation in judo athletes of high qualification. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 21(6), 272-227. doi:10.15561/18189172.2017.0603

Purpose: to study the connection of psychophysiological characteristics with different levels of motivation in judo athletes of high qualification. Material: highly qualified athletes were examined, members of the National Judo Team (men). All athletes ($n = 25$) were divided into three groups, depending on the level of motivation to achieve success. Results: it is established that the high level of motivation for achieving success in judo is provided by activation of neurodynamic, cognitive functions and the level of light resistance. Athletes with a high level of motivation to achieve success is observed the predominance of the

values of neurodynamic functions: endurance of the nervous system; speed of visual reactions. Athletes with an average level of motivation to achieve success identified higher values: productivity, speed, accuracy, effectiveness of verbal information. Athletes with a predominance of avoidance of failure motivation have a preference for other groups in the speed, efficiency and stability of the processes of thinking and processing information. Conclusions: judo athletes with a predominance of motivation to avoid a failure form coping strategy to prevent psycho-emotional stress. This helps to minimize the exhaustion of vegetative resources in conditions of extreme sports activity. Judo athletes with high level of motivation to achieve success, the presence of mental state of relative comfort is associated with the search for support among others and orientation toward internal beliefs.

Korobeynikov, G., Korobeinikova, L., Latishev, S., Shackih, V., Mischenko, V. (2017). *Current control of psychophysiological state of elite wrestlers during training process*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling. Novi Sad, Serbia.

The aim of the work was to elaborate the structure of current control of psychophysiological states of elite wrestlers during training process. The main task of the current control is to provide wrestling teams with scientifically based diagnostics of psychophysiological states of athletes with the estimate of athlete's autonomic nervous system condition, the evaluation and correction of their commitment and willingness and the evaluation and correction of individual training programs. In article different cognitive strategies of information processing in elite wrestlers is discussed with the emphasis on the functional asymmetry of brain. Also, the dynamics of athlete's pre-start, prelaunch reactions (before a competition) is described as manifested in neurodynamic functions and autonomic regulation of heart rate in elite athletes. In support of wrestling teams and based on the experience and scientific methodology, the structured logical model was proposed of current diagnostics of psychophysiological states of elite wrestlers under the conditions of muscular and psycho-emotional tension. Conclusion. Experience our scientific group acquired while working with the Ukrainian national Olympic wrestling teams enabled us to apply the methodology of current control of psychophysiological states for the correction of training process programs based on individual characteristics of elite wrestlers.

Korobeynikov, G., Korobeinikova, L., Latishev, S., Shackih, V. (2017). *The impact of emotions on visual-movement performance and effectiveness of competitive activity of elite wrestlers*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad, Serbia.

PURPOSE: The aim was to study the impact of emotions on visual processing in movement performance and its effects on the competitive activity of elite wrestlers. METHODS: The peculiarities of visual perception in information-processing conditions were studied in connection with the emotions of elite athletes. Nineteen elite athletes, Greco-Roman wrestlers, aged 19-22 years, were examined. The wrestlers completed the following tests: simple visual-motor reaction; reaction to a moving object; perception speed; and a scale of emotion excitability. Consents for research in written form were given by the athletes according to the recommendations of the Ethics Committee for Biomedical Research. RESULTS: The results indicate significant links between anger and certain aspects of visual perception in elite athletes. It is likely that the emotional factor of anger is a hindrance to concentration and attention in athletes resulting in ineffective information processing and leading to a deterioration of visual perception and effectiveness of competitive activity. CONCLUSIONS: Anger, as an affective emotion, is a negative characteristic in the wrestler's general functional state and potentially jeopardizes his/her competitive performance.

Koryagina, J. V., Nopin, S.V., Blinov, V.A., Blinov, O.A. (2017). Neurophysiological predictors for physical working capacity control: analysis of innovative studies by foreign laboratories in 2010-2016. *Theory and Practice of Physical Culture, 2017*(1), 192-194. A growing number of researchers devote their scientific career to studying the effect of exercise on the brain function. While the behavioral studies showed a strong association between physical exercises, cognitive functions and the psyche, the underlying neurophysiological effects are still unclear. Objective of the study was to make an analytical overview of the most promising studies in athletic neurophysiology and psychophysiology for the period since 2010 performed by the leading foreign university laboratories.

Kostorz, K., Gniezinska, A., & Nawrocka, M. (2017). The hierarchy of values vs. self-esteem of persons practising martial arts and combat sports. *Ido Movement for Culture-Journal of Martial Arts Anthropology, 17*(1), 15-22. doi:10.14589/ido.17.1.3 Background, Problem and Aim. According to experts, one's shared values and self-esteem exert a significant influence on the development of personality, disposition, commitment to the pursuit of one's objectives, the perception of the world, and interpersonal relations [Tomkiewicz, Poplawska 1997; Ostrowska 1998; Krok 2010; Komorowska-Pudlo 2014; Kostorz, Gniezinska 2016]. Although pragmatists in many fields give these issues due priority, the amount of research undertaken in the field of martial arts is relatively small and clearly inadequate compared with other disciplines. This led the authors to perform their own analyses. Methods. The research was conducted in Jastrzebie-Zdroj and Wodzislaw Slaski among 80 respondents divided into two groups: 1) practitioners (N=38) and 2) control group (N=42). A diagnostic survey was employed using the 'Scheler's Value Scale' (SVS) developed by Brzozowski and Self-Esteem Scale developed by Rosenberg in the Polish adaptation by Laguna, Lachowicz-Tabaczek and Dzwonkowska. Results. It was found that the women demonstrated statistically significantly higher level of values subscale of aesthetic ($p = 0.02$) and truth ($p = 0.048$). Non-practicing peers demonstrated

statistically significantly higher level of hedonistic values ($p = 0.01$), whereas practising respondents-to 'fitness and physical strength' ($p = 0.008$), moral values ($p = 0.002$), sacred ($p = 0.02$), 'religious sanctities' ($p = 0.002$) and self-esteem ($p = 0.01$). It was observed that men who trained martial arts were characterized by a higher level of self-esteem ($p = 0.03$) and attributed to the bigger importance 'fitness and physical strength' ($p = 0.01$), moral values ($p = 0.02$) and religious sanctities ($p = 0.003$). It was found that women from training group were characterized by a higher level of self-esteem ($p = 0.04$) than respondents in the control group. The results showed that the most explanatory model variables is 'fitness and physical strength', moral values and religious sanctities, and self-esteem at a significantly moderate statistical level. Conclusions. Bearing in mind that the hierarchy of values and self-esteem depends on a lot of factors, the authors recommend to conduct further research. An interesting issue would be to carry out the correlation analysis between the hierarchy of values adopted by practitioners of martial arts and self-esteem, and perception of their coach and his competence, interpersonal relationships, sense of quality of life, level and type of motivation, emotional intelligence, empathy and mental resilience. Besides, the findings show that it is advisable to include in further research an analysis of a relatively higher number of respondents living in several voivodeships. This would allow carrying out more structured analyses, exploring the problem, owing to which the lessons learnt could be more complete and more valuable.

Koyama, K., Nakazato, K., Maeda, S., Kikuchi, N., Matsumoto, S., & Hiranuma, K. (2017). Association of COL11A1 4603C/T polymorphism with cervical disc degeneration in collegiate wrestlers. *The Journal of sports medicine and physical fitness*. doi:10.23736/s0022-4707.17.07724-6

BACKGROUND: The authors previously identified that COL11A1 gene polymorphism is not a susceptibility factor for lumbar disc degeneration (LDD) in athletes. However, the relationship between COL11A1 gene polymorphism and cervical disc degeneration (CDD) remains unclear. We hypothesized that significant associations between COL11A1 4603C/T gene polymorphism and CDD, but not LDD, in collegiate wrestlers exist. This study aims to examine the relationship between CDD, LDD, and COL11A1 4603C/T gene polymorphism in collegiate wrestlers.; METHODS: The subjects enrolled in this study were 92 (Study1) and 123 (Study2) Japanese collegiate male wrestlers. Study1 and Study2 were conducted in 2010-2012 and 2012-2015, respectively.; RESULTS: CDD and LDD prevalence among the wrestlers was 51.1% (47/92) and 43.9% (54/123), respectively. We found that COL11A1 4603C/T was significantly associated with CDD, but not with LDD. Using logistic regression analysis with concomitant confounding factors, we further confirmed that COL11A1 4603C/T was a significant risk factor for CDD (codominant genetic model [CC vs CT+TT]: adjusted odds ratio [OR] = 2.28; 95% confidence interval [CI], 1.13-4.59; dominant genetic model [CC+CT vs TT]: adjusted OR = 11.71; 95% CI, 1.36-101.06).; CONCLUSIONS: Results suggest that COL11A1 4603C/T gene polymorphism is associated with an increased risk of CDD, but not LDD, in Japanese collegiate wrestlers.

Krishnan, A., Sharma, D., Bhatt, M., Dixit, A., & Pradeep, P. (2017). Comparison between Standing Broad Jump test and Wingate test for assessing lower limb anaerobic power in elite sportsmen. *Medical journal, Armed Forces India*, 73(2), 140-145. doi:10.1016/j.mjafi.2016.11.003

BACKGROUND: Lower limb explosive power is an important motor quality for sporting performance and indicates use of anaerobic energy systems like stored ATP and Creatine phosphate system. Weightlifting, Fencing and Wrestling use it for monitoring and identification of potential sportsmen. The Wingate test and Standing Broad Jump (SBJ) test are reliable and accurate tests for its assessment. This study conducted on elite Indian sportsmen tries to analyse feasibility of use of the SBJ test in sports and military medicine when Wingate test is impractical. METHODS: 95 elite sportsmen (51 Fencers, 17 Weight lifters and 27 Wrestlers) of a sports institute were administered Wingate cycle ergometer test and SBJ under standardised conditions. The results were analysed for mass and inter-discipline correlation. RESULTS: Analysis using Pearson's correlation showed significant positive correlation between Peak power ($r=0.446$, $p<0.0001$) and SBJ (distance) in all sportsmen. Inter-sport correlation showed positive correlation between SBJ and peak power ($r=0.335$, $p<0.016$) in Fencers and between SBJ, peak power ($r=0.686$, $p<0.002$) in Weightlifters. Bland-Altman plot analysis showed that about 94% pairs of peak power and SBJ were within limits of agreement for each discipline as well as among all sportsmen. CONCLUSION: The test results show definite correlation and SBJ test can be used as a field test in performance monitoring, talent identification, military recruit screening and injury prevention.

Kroshus, E., Kerr, Z. Y., DeFreese, J. D., & Parsons, J. T. (2017). Concussion Knowledge and Communication Behaviors of Collegiate Wrestling Coaches. *Health Communication*, 32(8), 963-969. doi:10.1080/10410236.2016.1196417

Sport coaches can play an important role in shaping a team's approach to concussion safety through their communication with team members. However, across all sports, there is limited knowledge about factors that make coaches more or less likely to engage in safety-supportive communication. The objectives of this study were to assess the concussion-related knowledge and attitudes of wrestling coaches, as well as the extent to which they engage in autonomy-supportive coaching practices, and to determine how these factors are related to communication with athletes in support of concussion safety. Data were collected through an online survey of head coaches of National Collegiate Athletic Association (NCAA) wrestling teams ($n = 89$, 40.5% response rate). On average, coaches answered five out of a possible nine knowledge questions correctly and were significantly more likely to think it was acceptable for an athlete to continue playing after sustaining a concussion during a national

qualifying competition as compared to during an early-season competition. Engaging in autonomy-supportive coaching behaviors was the coach factor explaining the largest percentage of variability in communication. Findings suggest that while knowledge deficits and attitudes about the acceptability of continued play while symptomatic during more consequential competitive matches should be addressed in educational programming for collegiate wrestling coaches, these changes alone may not be a sufficient for adequately increasing concussion safety communication. Targeting more distal factors such as autonomy-supportive approaches to coaching may hold promise for intervention design and should be explored in future prospective research.

Kruszewski, M., Olszewska, A., Kuźmicki, S., Kruszewski, A., Landowski, K., Tabęcki, R., . . . Chęć, R. (2017). Variants of strength athletics (progression) and its application in training practice especially considering the speed of exercise performance. *Journal of Combat Sports & Martial Arts*, 8(1), 1-7.

The aim of the study was to present the modifications of strength athletics, enabling the competitors to achieve maximal muscular stimulations, leading to the development of specific strength in large muscle groups. The application goal was also determined, involving presentation of exercise sets used in strength sports and combat sports, developing specific strength in major muscle groups, particularly considering the tempo of exercising in each training sub-periods. The reference sources are reviewed as well as the earlier publications, describing the basic modalities of strength athletics. The versions of this approach connected with methodical recommendations of Polish Strength Athletics School, established by Augustyn Dziedzic are also presented. Each variant of strength athletics is described in terms of its usefulness for developing maximal strength, anaerobic endurance, mastering motor habits (techniques), applying exercises which have a similar or a more complex structure than these previously applied and a fast tempo of exercising. Tempo variations are attributed to each sub-period of the training cycle, considering the frequency of application and exercise sets, aimed at the development of large muscle groups are presented. It is emphasized that strength athletics should be regarded as a set of approaches, which, regularly applied, allow considerable increases of maximal muscular strength, anaerobic endurance and mastering motor habits. It has been confirmed that the application of different modalities of exercising tempo not only enriches their resources, but also can increase muscular strength and power, significantly contributing to the improvement of athletic performance in combat sports.

Kusnierz, C., Cynarski, W. J., & Gorner, K. (2017). Social reception and understanding of combat sports and martial arts by both school students and adults. / Odbiór społeczny i rozumienie sportów i sztuk walki w opiniach młodzieży szkolnej i osób dorosłych. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(1), 30-37.

Background/Scientific Framework: Martial arts with their many centuries of history are perceived by public opinion as a carrier of many desirable values. Apart from the health benefits they are used for moral education, and the reduction of social brutality, as well as bringing positive models of behaviour, while complacency also being a source of well-being. Problem and Aim: The paper aims to learn what both school students and adults think about combat sports and martial arts. The questions this gives rise to are: what is the public reception of martial arts and combat sports and what are the values of the training recognised by people who are not involved in Martial Arts training. Material and Methods. The research uses the diagnostic survey method of with a questionnaire. As a research tool, a modified survey questionnaire on martial arts and combat sports was used for surveying N=192 people in total (Opole, Poland, 2015). Results. The results obtained show that people not involved in the training have a favourable perception of combat sports and martial arts, while showing they also show discrepancies in opinions on the effect of training on spiritual growth and aggression, which is often perceived as a trait of people in training. Conclusions. Untrained people rank at number 1 the possibility of achieving a high level of physical fitness, then secondly, self-discipline and a healthy and clean-living lifestyle when describing the benefits of close combat training. Different opinions were found on the effect the training on children and young people, which proves the need for more attention to be paid to the educational aspects of martial arts training activities.

Kutseryb, T., Vovkanych, L., Hrynkiv, M., Majevska, S., & Muzyka, F. (2017). Peculiarities of the somatotype of athletes with different directions of the training process. *Journal of Physical Education & Sport*, 17(1), 431-435.

The reaction of the athletes' organism on the physical loads is mostly determined by the peculiarities of their somatotype and plays an important role in the selection of sport activities. Therefore, we have used the Heath-Carter somatotyping to describe the peculiarities of somatotypes of the athletes, representing 12 different sports (188 males with sport experience more than 5 years). The aim of the study was to compare the somatotypes of athletes with different directions of training process. It was found the two dominant somatotypes for combat sports athletes: balanced mesomorph (average somatotype for gopak fight is 2.39-4.44-2.71; for fencing - 2.53-5.28-2.18) and endomorphic mesomorph (karate WKF - 3.67-5.27-2.85; boxing - 3.66-4.58-2.81). The mesomorphy dominates in somatotype of the athletes, who participate in strength sports, wrestling, rowing and swimming. The most frequently observed somatotype in the groups of weightlifters (2.89-5.68- 2.26), wrestlers (5.11-5.70-1.84), rowers (4.48-5.38-2.23) and swimmers (3.65-4.52-2.76) was endomorphic mesomorph. In the group of athletes, who participate in game sports, the somatotypes of balanced mesomorph (volleyball - 3.09-4.54-3.08 and tennis - 3.60-4.62-3.27) or endomorphic mesomorph (football - 3.75-4.34- 3.16) prevail. The average somatotype of high jumpers is 2.73-2.73-4.89 (balanced ectomorph). We can suppose the increase of ectomorphy in the case of high amount of vertical jumping elements during competitive and training activity (games, high jumping). The mesomorphy becomes dominant when the speed and

strength loadings prevail (combat sports, weightlifting, wrestling, rowing and swimming). In this case the highest endomorphy has been found among the athletes, engaged in the sports without essential amount of vertical body movements (wrestling, rowing and swimming).

Kuvacic, G., Krstulovic, S., & Caput, P. D. (2017). Factors Determining Success in Youth Judokas. *Journal of Human Kinetics*, 56(1), 207-217. doi:10.1515/hukin-2017-0038

The aim of this study was to compare two models of determining factors for success in judo. The first model (Model A) included testing motor abilities of high-level Croatian judokas in the cadet age category. The sample in Model A consisted of 71 male and female judokas aged 16 +/- 0.6 years who were divided into four subsamples according to sex and weight category. The second model (Model B) consisted of interviewing 40 top-level judo experts on the importance of motor abilities for cadets' success in judo. According to Model A, the greatest impact on the criterion variable of success in males and females of heavier weight categories were variables assessing maximum strength, coordination and jumping ability. In the lighter weight male categories, the highest correlation with the criterion variable of success was the variable assessing agility. However, in the lighter weight female categories, the greatest impact on success had the variable assessing muscular endurance. In Model B, specific endurance was crucial for success in judo, while flexibility was the least important, regardless of sex and weight category. Spearman's rank correlation coefficients showed that there were no significant correlations in the results obtained in Models A and B for all observed subsamples. Although no significant correlations between the factors for success obtained through Models A and B were found, common determinants of success, regardless of the applied model, were identified.

Levitsky, A. G., Matveyev, D.A., Potsipun, A.A., Oshina, O.V., Kholodkov, O.V. (2017). Biomechanical classification of actions in competitive wrestling. *Theory and Practice of Physical Culture*, 2017(10), 66-68.

The study offers a biomechanical classification of actions in competitive wrestling based on the traditional description of objects in modern mechanics. Standing technical actions are classified into the following 4 groups: force couple; lever; mechanical block; and combined throws. The proposed classification makes it possible to generate physical values to rate the throw execution techniques. In case of a rotation throw with the under-shoulder grip, for instance, the action may be 3 times more efficient if the rotation angle is duly increased. The proposed classification may be applied in the education and training process at technical universities. The relevant mechanical process models may be used to reinforce the interdisciplinary connections and learning quality in the academic Physical Education discipline and the core academic discipline. This will encourage further interest of the students in the studies and improve the learning process quality and, consequently, improve the technical background of the students and their motivations for the academic and training process. The proposed classification may be supplemented by grouped technical actions based on some other process models applied in modern mechanics.

Leźnicka, K., Kurzawski, M., Cięższyk, P., Safranow, K., Malinowski, D., Brzezińska-Lasota, E., & Zmijewski, P. (2017). Polymorphisms of catechol-O-methyltransferase (COMT rs4680:G>A) and μ -opioid receptor (OPRM1 rs1799971:A >G) in relation to pain perception in combat athletes. *Biology of Sport*, 34(3), 295-301.

In athletes, pain has diverse functions and a complex etiology. Its role is not limited to indicating the limits of the body, especially in areas that are exposed to maximal forces and stresses and consequently vulnerable to damage or injury. Several common single nucleotide polymorphisms (SNPs) have been recently associated with inter-individual differences in pain perception. Among several other markers, catechol-O-methyltransferase (COMT rs4680: G>A) and the μ -opioid receptor (OPRM1 rs1799971: A >G) were proposed as key factors for pain perception. The aim of the current study was to investigate the potential association between COMT and OPRM1 genotypes and pain perception as well as the relation with elite athlete status. The study involved 395 healthy men, aged 18 to 28 years; 214 combat sports athletes comprised the experimental group and 181 non-athletes comprised the control group. DNA was extracted from buccal cells donated by the subjects, and genotyping for COMT rs4680 and OPRM1 rs1799971 was carried out using real-time PCR. Measurement of the pain threshold and pain tolerance was performed using an algometer and the cold pressor test. The genotype distribution of COMT and OPRM1 polymorphisms did not differ between combat athletes and the control group ($p=0.500$ and $p=0.390$). Pain threshold and pain tolerance as both quantitative and qualitative measures did not differ with respect to OPRM1 and COMT polymorphism in either the combat or the control group for any of the analysed genetic models.

Leźnicka, K., Pawlak, M., Białecka, M., Safranow, K., & Cięższyk, P. (2017). Pain perception and cardiovascular system response among athletes playing contact sports. *Research in Sports Medicine*, 25(3), 290-299. doi:10.1080/15438627.2017.1314288

ABSTRACT: The aim of this study was to determine whether the contact sports change the perception of pain as assessed by the cold pressor test (CPT), and if the test induces the same reaction of the cardiovascular system in contact athletes and non-athletes. The study involved 321 healthy men; 140 contact athletes and 181 students of the University of Szczecin (control). Pain threshold and pain tolerance were evaluated using CPT. Cardiovascular measurements were made during CPT. The contact athletes showed a much higher tolerance to pain than the control group (median time 120 vs. 94 s, respectively, $p = 0.0002$). The thresholds of pain in both groups did not differ significantly between the groups. Systolic blood pressure

measured before and during the test in all three measurements was statistically significantly higher in athletes compared with the control group. Heart rate and diastolic blood pressure did not differ significantly between the studied groups.

Limongi França Guilherme, J. P., & Herbert Lancha Jr, A. (2017). Single Nucleotide Polymorphisms in Carnosinase Genes (CNDP1 and CNDP2) are Associated with Power Athletic Status. *International Journal of Sport Nutrition & Exercise Metabolism*, 27(6), 533-542. doi:10.1123/ijsnem.2017-0098

Carnosine (β -alanyl-L-histidine), abundantly found in skeletal muscle, plays an important role during exercise, especially for high-intensity contractions. Variability in muscle carnosine content between individuals exists and may also be explained by different genetic bases, although no study has addressed the association of polymorphisms in genes related to carnosine metabolism in athletes. This study aimed to investigate the frequency of single nucleotide polymorphisms (SNPs) in the carnosinase genes (CNDP1 and CNDP2) in a large Brazilian cohort of athletes and nonathletes. Eight SNPs were compared between a representative cohort of elite athletes from Brazil (n = 908) and a paired group of nonathletes (n = 967). The athletes were stratified into three groups: endurance (n = 328), power (n = 415), and combat (n = 165). The CNDP2 rs6566810 (A/A genotype) is overrepresented in endurance athletes, but only in international-level endurance athletes. Three SNPs (CNDP2 rs3764509, CNDP2-CNDP1 rs2346061, and CNDP1 rs2887) were overrepresented in power athletes compared with nonathletes. Carriers of the minor allele had an increased odds ratio of being a power athlete. For the rs2346061, no significant difference was observed in genotype frequencies between power and combat sports athletes, but for rs2887 the power and combat groups showed an inverse genotype distribution. In conclusion, we found that minor alleles carriers for CNDP2 rs3764509 (G-allele), CNDP2-CNDP1 rs2346061 (C-allele), and CNDP1 rs2887 (A-allele) are more likely to be a power athlete. These polymorphisms may be novel genetic markers for power athletes. Furthermore, these results are suggestive of a distinct CNDP genotype for sporting development.

Lindsay, A., Carr, S., Cross, S., Petersen, C., Lewis, J. G., & Gieseg, S. P. (2017). The physiological response to cold-water immersion following a mixed martial arts training session. *Applied Physiology, Nutrition & Metabolism*, 42(5), 529-536. doi:10.1139/apnm-2016-0582

Combative sport is one of the most physically intense forms of exercise, yet the effect of recovery interventions has been largely unexplored. We investigated the effect of cold-water immersion on structural, inflammatory, and physiological stress biomarkers following a mixed martial arts (MMA) contest preparation training session in comparison with passive recovery. Semiprofessional MMA competitors (n = 15) were randomly assigned to a cold-water immersion (15 min at 10 °C) or passive recovery protocol (ambient air) completed immediately following a contest preparation training session. Markers of muscle damage (urinary myoglobin), inflammation/oxidative stress (urinary neopterin + total neopterin (neopterin + 7,8-dihydroneopterin)), and hypothalamic-pituitary axis (HPA) activation (saliva cortisol) were determined before, immediately after, and 1, 2, and 24 h postsession. Ratings of perceived soreness and fatigue, counter movement jump, and gastrointestinal temperature were also measured. Concentrations of all biomarkers increased significantly (p < 0.05) postsession. Cold water immersion attenuated increases in urinary neopterin (p < 0.05, d = 0.58), total neopterin (p < 0.05, d = 0.89), and saliva cortisol after 2 h (p < 0.05, d = 0.68) and urinary neopterin again at 24 h (p < 0.01, d = 0.57) in comparison with passive recovery. Perceived soreness, fatigue, and gastrointestinal temperatures were also lower for the cold-water immersion group at several time points postsession whilst counter movement jump did not differ. Combative sport athletes who are subjected to impact-induced stress may benefit from immediate cold-water immersion as a simple recovery intervention that reduces delayed onset muscle soreness as well as macrophage and HPA activation whilst not impairing functional performance.

Lopez-Gullon, J. M., Martínez Abellan, A., de Calasanz Rabadan Iniesta, J., Casals, C. (2017). *Effects of dehydration performance for cut weight in combat sports* Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.

In this review we discuss: I) the physiological and neuromuscular effects described in the literature for different degrees of body mass loss before the official weigh, II) the recovery or "rebound effect" that occurs between the official weigh and the competition beginning, III) the validity of non-invasive markers to estimate hydration status that coaches may use in monitoring the athlete's weight loss. METHODS: Comparison of various studies in which the hydration status and weight loss of combat sports athletes are analyzed. RESULTS: "Weight loss effects" Dehydration can produce many negative physiological effects that have an obvious repercussion on sport performance, however, it is important the diet applied after weighing up to competition so as not to have a performance loss. "Rebound effect". There are few studies analyzing what occurs in the athletes after the official weighing and the beginning of the competition, it is interesting to know that it occurs in 6 - 18 hours until the beginning of the competition, affecting the athlete's concentration and decision making. "Hydration Indicators". The best method in the majority of investigations is the osmolality in plasma (POSM) or urine (UOSM); although other methods have been reviewed as more economical, such as specific gravity of the urine, urine color, bioelectric impedance, and perception of thirst, being these simpler methods to know the state of hydration. CONCLUSIONS: It is necessary to elaborate a method that allows to know the weight loss habits of the athletes; thus, it could impact on their health and sport performance allowing an optimal recovery for the competition after the weighting. Future investigations are needed to know the rapid

weight loss habits and consequences, the level of performance after weighing, and the psychological effects due to the weight loss habits of the athletes.

- López-Gullón, J. M., Martínez-Abellán, A., & Pallarés, J. G. (2017). Optimismo versus pesimismo precompetitivo en los deportes de combate olímpicos. Diferencias de género, ranking y campeones. / Optimism versus pre-competitive pessimism in Olympic combat sports. Gender differences, ranking and champions. *Cuadernos de Psicología del Deporte*, 17(2), 67-72.
- The aim of this study was to analyze the influence of the optimism and pessimism in the Spanish championships of each of the Olympic combat disciplines examined, as well as to assess differences by gender, ranking and champions. The total sample was 183 subjects, all of them specialist in wrestling, taekwondo and boxing. Everyone conducted the LOT-R questionnaire, in the Spanish version, 30 to 60 minutes before the official weighing of their respective national championships. The results show a higher number of male athletes optimistic (85,2%), in relation to female athletes (72,7%). The data regarding the ranking championship medalists and non-medalists were very similar for both pessimistic and optimistic. These results indicate that it may be helpful for combat athletes and their coaches to develop pre-competitive scales score as well as to assist in the usual methods of talents selection.
- Lüdemann, R., Nowoisky, C., Büsch, D., Zamanduridis, J. (2017). Analysis of the Olympic cycle 2012-2016 in olympic wrestling. In J. Wick, Seidel, I., Büsch, D. (Ed.), *Olympiaanalyse Rio 2016: Olympiazyklusanalysen und Auswertungen der Olympischen Spiele 2016* (pp. 258-278). Aachen, Germany: Meyer & Meyer Sport.
- The analysis of the Olympic cycle 2012-2016 includes both impressions and analyses of the coaches and the sports director of the German Wrestling Federation and the qualitative and quantitative analyses of the wrestling research group at the Institute for Applied Training Science. As regards wrestling, this connective approach has proven of value. This article summarizes findings that have been elaborated, discussed together and partially transferred into sports practice. The basis of the qualitative and quantitative analyses were on the one hand the personal and match data from the "Result Books". On the other hand, specific performance data were collected on the basis of systematic video observation by means of the video processing software Utilius® vs. Other competition parameters relevant for success than attack efficiency could not be clarified. Nevertheless, together with representatives from sports practice, strong points of the international elite's combat behavior and of the best German athletes were clarified, because especially these features constitute starting-points for training and the elaboration of conceptual basics. A high level of individual technical and tactical abilities as well as specific physical capacities are part of it. In the national coaches' opinion, the latter ones have an impact on competition performance that cannot be compensated.
- Mackie, G. M., Samocha-Bonet, D., & Tam, C. S. (2017). Does weight cycling promote obesity and metabolic risk factors? *Obesity Research & Clinical Practice*, 11(2), 131-139. doi:<https://doi.org/10.1016/j.orcp.2016.10.284>
- Summary There remains common belief in the general community that weight cycling or 'yo-yo dieting' is associated with potential adverse effects on obesity and metabolic risk factors. In 1994, a review by the National Task Force on the Prevention and Treatment of Obesity concluded that weight cycling did not impact metabolism, and that weight loss attempts should not be discouraged. This study is an updated review of the literature published since 1994, to determine if weight cycling is associated with metabolic risk factors for obesity and type 2 diabetes. A systematic literature search was conducted in PubMed, ISI Web of Science and SCOPUS to identify primary studies that examined weight cycling in relation to obesity and metabolic risk factors. Thirty-one studies with human subjects were retained. Fifty-eight percent (11/19) of publications reported that a history of weight cycling was correlated with increased body fat and central adiposity. Another fifty percent (4/8) of studies reported that the presence of weight cycling increased the likelihood of future weight gain, suggesting that weight cycling is potentially problematic for individuals attempting to lose weight. The majority of studies (13/17; 76%) did not show a detrimental effect of weight cycling on risk of type 2 diabetes. There is some evidence showing that weight cycling has no effect on risk of type 2 diabetes and inconclusive evidence that a history or presence of weight cycling influences body composition, or predisposes to future obesity. The available evidence so far suggests that there is little detrimental effect of weight cycling on current and future obesity and metabolic risk, and therefore weight loss efforts in individuals with overweight/obesity should continue to be encouraged.
- Magnani Branco, B. H., Lopes-Silva, J. P., da Silva Santos, J. F., Julio, U. F., Goncalves Panissa, V. L., & Franchini, E. (2017). Monitoring training during four weeks of three different modes of high-intensity interval training in judo athletes. *Archives of Budo*, 13, 51-62.
- Background and study aim: Ideal control of training load and physiological recovery between training sessions and competitions are important aspects for training periodization and improve performance in competition. The aim of this study was the effects of 4-weeks of three different modes of high-intensity interval training (HIIT) on the heart rate variability (HRV), as well as perceptual, physiological and psychometric responses among judo athletes. Material and Methods: Thirty-five judo athletes were randomized into three training groups: 2 blocks of 10 sets of 20s all-out effort by 10s recovery twice a week using lower-body [high-intensity exercise (HIE) in cycle-ergometer for lower-limbs with 4.5% of body mass]; upper-body (HIE in cycle-ergometer for upper-limbs with 3% of body mass); uchi-komi (HIE by means of technique-entrance) and a control group

(judo trained only). The HRV was monitored at rest at the beginning of each week. The frequencies analysed were the root mean square of successive differences in the R-R intervals (rMSSD) and rMSSD/MRR (mean of R-R intervals) ratio. Blood samples were collected to measure hormone concentrations [free-testosterone and cortisol] and cellular damage markers [creatin kinase (CK), lactate dehydrogenase (LDH), aspartate aminotransferase (AST) and alanine aminotransferase (ALT)] before and after the training period. The ratings of perceived recovery (RPR) and exertion (RPE) were reported in each HIE-session. The psychometric questionnaires were applied weekly. Results: There was no difference for HRV, RPE, internal training load, psychometric questionnaires, hormonal levels, CK, AST and ALT ($p > 0.05$). There was a moment effect for the uchi-komi group, with higher values for RPR in the first HIE-session when compared to the second ($p = 0.014$) and an increase of LDH to the upper-body group ($p = 0.031$) after 4-weeks. Conclusion: Thus, low-volume HIIT promoted only a moment effect for RPR in uchi-komi group and an elevation of LDH in the upper-body after 4-weeks.

Martins, P., Pedro, S. (2017). Motivational Regulations and Recovery in Olympic Wrestlers. *International journal of wrestling science*, 7(1).

This study explores the relationship between motivational regulations in the self-determination continuum and recovery processes in wrestlers. Such knowledge may help coaches creating and maintaining a positive climate both in training and competition, allowing better results and performances. Results indicate that both intrinsic and extrinsic motives are related to the wrestler's recovery process, especially on personal and social characteristics. For instance, the intrinsic motivation and personal and social well-being association is $r = .60$, $p = .05$, and the introjected extrinsic motivation and personal acceptance is $r = .66$, $p = .05$. With this study, it is possible to better understand wrestlers' motivational patterns and their relationship with recovery processes, which allows coaches to better regulate athletes' feelings of sports adhesion and belonging created within the team regarding their contribution to the recovery process.

Martins, P., & Rosado, A. (2017). A formação de treinadores de luta olímpica: estudos das fontes de conhecimento e conteúdos de formação essenciais. The training of Olympic wrestling coaches; study of the sources of knowledge and essential training contents. *Revista de Artes Marciais Asiáticas*, 12(1), 24-40. doi:10.18002/rama.v12i1.3687

The aim of this study was to analyze the representation of wrestling coaches regarding the sources of knowledge and the training contents to be adopted during the training process of young wrestler's coaches. The study was based on Grossman's (1990) model of professional knowledge for teaching and followed a qualitative, multiple case study methodology. Following a semi-structured script, six Olympic wrestling experts were interviewed in-depth, trying to identify the sources of knowledge that the coaches used for their training and what didactic-methodological contents they considered essential to play their role as coach. The analysis revealed that the coaches' sources of professional knowledge were diverse, including academic training and professional experience as the main sources of access to professional knowledge. The coaches also pointed out that their first sources of knowledge were their experiences as competitive athletes. Finally, this study concludes that expert coaches must acquire a profound knowledge of the competition environment, seeking to optimize their influence on athletes, which should extend not only to the sport practice of the youngster-as an athlete -but also at the level of the athlete as a person.

Martirosov, E. G., Semenov, M. M., & Martirosova, K. E. (2017). The method of determination of phenotypic sex on the basis of morphological and functional indicators. [Способ определения фенотипического пола на основе морфофункциональных показателей]. *Vestnik Moskovskogo universiteta. Seriya 23: Antropologiya*(1), 80-88.

Objective: to provide a method for determining phenotypic gender of the person on the basis of morpho-functional indices. The morpho-functional survey of 283 people was done for (158 men and 125 women); native Muscovites leading a healthy lifestyle, not involved in professional sports. The surveyed age 18-35 years, mean age 26,3 years. There were determined body size, body proportions, the composition of the body mass - by caliper and bioimpedance analysis, vital capacity of lungs, dynamometry of hands and dead lift strength. In total each person was tested by 245 different indicators of morpho-functional development. To identify the main informative predictors and development of decision rules to identify men and women was conducted stepwise regression analysis [Halafian, 2007]. In addition, to verify the new method for the determination of phenotypic gender were also examined wrestlers of high qualification specializing in free-style wrestling - 132 men and 170 women wrestlers. 302 people in general. In addition, another new sample of 32 strongest women wrestlers, was the comparison of the results of the assessment of phenotypic gender by the newly developed technique (Martirosov, Semenov, Martirosova) and method of Sandra BEM [Bem, 1974], which is recommended to determine psychological gender. In the result was offered the new, authentic way of determining the phenotypic sex of morpho-functional indicators (priority of Rospatent No. 2016105985 from 20.02.2016). The method of determining the phenotypic sex of the person is based on the use of morphological and functional indicators developed by the decision rule and the classification of the subject, taking into account his calculated individual value in one of five classes of centile scale to which it corresponds, depending on the severity of femininity, androgyny or masculinity. The coefficient of multiple correlation the phenotypic sex determined with the selected predictors is $R = 0,91$; the coefficient of determination is $R^2 = 0,83$. The reliability of the phenotypic sex determination and classification of individuals in one of the classes is very high - 83%.

Цель работы: разработка способа определения фенотипического пола человека на основе морфофункциональных показателей. Проведено морфофункциональное обследование 283 человек, (158 мужчин и 125 женщин) коренных

москвичей, ведущих здоровый образ жизни и не занимающихся профессиональным спортом. Возраст обследованных 18-35 лет, средний возраст - 26,3 лет. Для каждого испытуемого было определено 245 показателей морфофункционального развития, в том числе тотальные размеры тела, пропорции тела, состав массы тела - (калиперометрическим и биоимпедансометрическим методами), жизненная емкость легких, динамометрия кистей рук и станова́я сила. С целью выявления основных информативных предикторов и разработки решающих правил для идентификации мужчин и женщин, был проведен пошаговый регрессионный анализ [Халафян, 2007]. Кроме того, для проверки работоспособности нового метода определения фенотипического пола, были дополнительно обследованы борцы высокой квалификации, специализирующиеся в вольной борьбе (132 мужчины и 170 женщин). Дополнительно, на другой выборке из 32 сильнейших борцов-женщин было проведено сравнение результатов оценки фенотипического пола по вновь разработанной методике (Мартиросов, Семенов, Мартиросова) и метода Сандры Бем [Bem, 1974], который рекомендован для определения психологического пола. В результате предложен новый способ определения фенотипического пола (патент из Роспатента № 2609626 от 02.02.2017). Предлагаемый способ определения фенотипического пола человека основан на использовании морфофункциональных показателей, разработанного решающего правила и отнесения испытуемого, с учетом его рассчитываемого индивидуального значения, в один из пяти классов центильной шкалы, которому соответствует испытуемый, в зависимости от выраженности феминности, андрогинности или маскулинности. Коэффициент множественной корреляции определяемого фенотипического пола с выделенными предикторами равен $R=0,91$; коэффициент детерминации равен $R^2=0,83$. Надежность определения фенотипического пола и отнесения индивидов в один из классов очень высокая и составляет 83%.

Martykanova, D. S., Davletova, N. C., Zemlenuhin, I. A., Mugallimov, S. M., Ahatov, A. M., Karamova, N. S., . . . Grigoryeva, T. V. (2017). Characterization of Dysbiotic Changes of Skin Microbiota in Contact Sports Athletes. *Bionanoscience*, 7(1), 1-3.

doi:10.1007/s12668-017-0396-0

Contact sports athletes often suffer from various skin disorders (inflammatory diseases of bacterial and fungal origin, atopic dermatitis, psoriasis, etc.) resulting in long breaks in training which ruin athletic performance. Wrestling implies intense skin-to-skin contact that creates perfect conditions for transmission of the infectious agents. Following the standard rules of hygiene (showering and handwashing directly after each competition and training) does not exclude the possibility to get an infection from sparring partner. To characterize the skin microbial composition of wrestlers who do not have current manifestation of any skin disorders, the metagenomic analysis was performed. Absolute predominance of Bacillus genus in metagenomic profiles of wrestlers' skin was observed in contrast with the existing literature data. Classic microbiological approaches allowed to detect hemolytic forms of microorganisms. Wrestlers' skin appeared to be colonized with hemolytic bacilli, whereas the non-wrestler athletes did not have such bacteria on their skin. Such dysbiotic shifts in the microbial community may cause the emergence of skin diseases. Revealed properties could help to design highly effective antiseptics for the contact sports hygiene.

Matthews, J. J., & Nicholas, C. (2017). Extreme Rapid Weight Loss and Rapid Weight Gain Observed in UK Mixed Martial Arts Athletes Preparing for Competition. *International Journal of Sport Nutrition and Exercise Metabolism*, 27(2), 122-129.

doi:10.1123/ijsem.2016-0174

There is a lack of research documenting the weight-making practices of mixed-martial-arts (MMA) competitors. The purpose of the investigation was to quantify the magnitude and identify the methods of rapid weight loss (RWL) and rapid weight gain (RWG) in MMA athletes preparing for competition. Seven athletes (mean SD, age 24.6 +/- 3.5 yrs, body mass 69.9 +/- 5.7 kg, competitive experience 3.1 +/- 2.2 yrs) participated in a repeated-measures design. Measures of dietary intake, urinary hydration status, and body mass were recorded in the week preceding competition. Body mass decreased significantly ($p < .0005$) from baseline by 5.6 +/- 1.4 kg (8.1%). During the RWG period (32 hr) body mass increased significantly ($p < .001$) by 7.4 +/- 2.8 kg (11.7%), exceeding RWL. Mean energy and carbohydrate intake were 3176 +/- 482 kcal·day⁻¹ and 471 +/- 124 g·day⁻¹, respectively. At the official weigh-in 57% of athletes were dehydrated (1033 +/- 19 mOsmol·kg⁻¹) and the remaining 43% were severely dehydrated (1267 +/- 47 mOsmol·kg⁻¹). Athletes reported using harmful dehydration-based RWL strategies, including sauna (43%) and training in plastic suits (43%). Results demonstrated RWG greater than RWL, this is a novel finding and may be attributable to the 32 hr duration from weigh-in till competition. The observed magnitude of RWL and strategies used are comparable to those which have previously resulted in fatalities. Rule changes which make RWL impractical should be implemented with immediate effect to ensure the health, safety and wellbeing of competitors.

McKenna, Z. J., & Gillum, T. L. (2017). Effects of exercise induced dehydration and glycerol rehydration on anaerobic power in male collegiate wrestlers. *Journal of Strength & Conditioning Research (Lippincott Williams & Wilkins)*, 31(11), 2965-2968.

Wrestlers attempting to reach a specific weight class often use rapid weight loss (RWL). Rapid weight loss is associated with high levels of dehydration, which may hinder athletic performance. Thus, there is a need for wrestlers to optimize rehydration after achieving a specific weight. We sought to observe the effects of RWL on anaerobic power and the impact of glycerol on rehydration and power in male collegiate wrestlers ($n = 7$, 19.75 ± 1.67 years, 76.8 ± 4.32 kg, $11.6 \pm 4.32\%$ body fat, 59.9 ± 6.42 ml·kg⁻¹·min⁻¹). Subjects were assessed for body mass (BM), hydration, and mean power output (W_{mean}) before exercise (pre),

immediately after exercise (3% dehydrated), and 60 minutes after exercise (rehydrated). Participants ran at 70% of ...O₂max in a heated room (30°C) until 3% BM loss (BML). Subjects rehydrated drinking either 26 ml·kg⁻¹ of water (control) or a 3% glycerol (treatment) solution containing 26 ml·kg⁻¹ of water and 1 g·kg⁻¹ of glycerol. Participants lost 3.00 ± 0.31% (control) and 2.89 ± 0.26% (treatment) of their BM from the pre- to dehydrated conditions. W_{mean} (control: 659.29 ± 79.12, 651.43 ± 70.71, 659.71 ± 82.78; treatment: 647.71 ± 110.64, 644.57 ± 118.15, 638.14 ± 100.71) did not differ across time (p = 0.87) nor condition (p = 0.80). In addition, glycerol had no significant impact on acute hydration (control: urine-specific gravity [SG] = 1.019 ± 0.010; treatment: SG = 1.017 ± 0.017). These data show that 3% BML did not impair anaerobic performance, and furthermore that glycerol proved ineffective for rehydration in a match like scenario for the competing wrestler.

Meron, A., McMullen, C., Laker, S. R., Currie, D., & Comstock, R. D. (2017). Epidemiology of Cervical Spine Injuries in High School Athletes Over a Ten-Year Period. *PM & R : the journal of injury, function, and rehabilitation*. doi:10.1016/j.pmrj.2017.09.003
BACKGROUND: Over 7 million athletes participate in high school (HS) sports annually, with both the benefits of physical activity and risks of injury. While catastrophic cervical spine injuries have been studied, limited data are available characterizing less severe cervical spine injuries in HS athletes. OBJECTIVE: To describe and compare cervical spine injury rates and patterns among United States (US) HS athletes across 24 sports over a ten-year period. DESIGN: Descriptive epidemiology study
SETTING: National sample of high schools participating in the High School Reporting Information Online (High School RIO) injury surveillance system. PARTICIPANTS: Athletes from participating schools injured in a school sanctioned practice, competition, or performance during the 2005-2006 through 2014-2015 academic years. METHODS: Cervical spine injury data captured by High School RIO during the ten-year study period were examined. Cervical spine injury was defined as any injury to the cervical spinal cord, bones, nerves, or supporting structures of the cervical spine including muscles, ligaments, and tendons. MAIN OUTCOME MEASUREMENTS: Cervical spine injury rates, diagnoses, mechanisms, and severities. RESULTS: During the study period, 1,080 cervical spine injuries were reported during 35,581,036 athlete exposures (AE) for an injury rate of 3.04 per 100,000 AE. Injury rates were highest in football (10.10), wrestling (7.42) and girls' gymnastics (4.95). Muscle injuries were most common (63.1%), followed by nerve injuries (20.5%). A larger proportion of football injuries were nerve injuries compared to all other sports (IPR, 3.31; CI, 2.33-4.72), while in boys' ice hockey fractures represented a greater proportion of injuries compared with all other sports (IPR, 7.64; CI, 2.10-27.83). Overall, the most common mechanisms of injury were contact with another player (70.7%) and contact with playing surface (16.1%). CONCLUSIONS: Cervical spine injury rates and patterns vary by sport and gender. Characterizing these differences is the first step in developing effective, evidence-based prevention guidelines.

Min, H., Jiazhi, S., Junhao, H., Xiaohui, H., & Yang, Y. (2017). Relationship between bone mineral values and leg anaerobic power in professional wrestlers. *Biomedical Research (0970-938X)*, 28(3), 1266-1271.
This study aimed to determine the relationship between bone mineral values and anaerobic power in professional wrestlers. A cross-sectional study was performed on 14 male wrestlers (22.9 ± 3.4 years) and 11 untrained men (24.5 ± 1.6 years; controls). Bone Mineral Content (BMC), Bone Mineral Density (BMD) and body composition were examined using dual-energy X-ray absorptiometry. Peak Power (PP) and Mean Power (MP) were measured by Wingate Anaerobic Test. The research showed that the wrestlers had greater leg lean mass, BMC and BMD, as well as MP expressed in absolute terms (W), and relative to body mass (W·kg⁻¹) compared with controls. MP (W) was correlated with leg lean mass in both groups. PP (W) and MP (W) were notably associated with BMC and BMD in both wrestlers and untrained men (r=0.608, p<0.021 and r=0.717, p<0.004) respectively, although less significant in controls. PP (W·kg⁻¹) and MP (W·kg⁻¹) were associated with BMD in wrestlers (r=0.616, p<0.05; r=0.641, p<0.05, respectively), but not in controls. In the total subject population, PP (W) and MP (W) correlated with leg lean mass, BMC and BMD. In conclusion, bone mineral values, especially BMD were significantly associated with anaerobic power in both the absolute and relative measures in wrestlers.

Mirzaei, B., Lotfi, N., Bolboli, L. (2017). *Does ambient temperature effect exercise-induced fatigue and sustainability of repetitions in cadet wrestlers?* Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.
PURPOSE: The purpose of the present study was to investigate the effect of ambient temperature on exercise-induced fatigue and sustainability of repetitions in cadet wrestlers. METHODS: 21 cadet wrestlers (age: 15.04±0.8 years, weight: 59.20±12.67 kg, height: 163.47±7.39 cm, body fat: 10.03±3.39%) participated as subjects in this study. Based on body composition and anthropometric profiles, subjects were divided into three similar groups. After providing the desired temperature (30, 18 and 10 °C), subjects were asked to complete a Wrestling Technique Based Circuit Training protocol. Fatigue level was measured by Likert scale (5-point scale) before, immediately and 30 minutes after exercise and the ability of sustainability of repetitions was measured by counting number of implemented techniques. Independent Samples t-test, ANOVA repeated measures, one-way ANOVA and Bonferroni post-hoc tests were used to analyze the results at a significance level of p< 0.05. RESULTS: The results showed that the levels of fatigue increased significantly after exercise in all groups and it was observed significant difference between high-temperature (HT) and low-temperature (LT) groups with normal-temperature (NT) group. In addition, the ability to sustainability of repetitions decreased significantly in all groups in second-round and this reduction was higher in HT and LT groups compared to NT group. Also, significant differences were observed between HT- NT groups and LT - NT groups.

However, after 30-minutes of active rest despite the decrease in fatigue levels, significant difference was observed between the levels of pre- exercise and after 30-minute recovery time in all groups. CONCLUSION: The results showed that heat stress can aggravate exercise-induced fatigue in cadet wrestlers. Thus, it is suggested that special attention should be paid to ambient temperature of competition and training gyms of this age group.

Mirzaei, B., Moghaddam, M.G., Abadi, H.A.Y. (2017). Analysis of Energy Systems in Greco-Roman and Freestyle Wrestlers Who Participated in the 2015 and 2016 World Championships. *International journal of wrestling science*, 7(1).

The aim of this study was to analyze the energy systems in all Greco-Roman (GR) and freestyle (FS) wrestlers who participated in the 2015 and 2016 world championships (WCh). The materials of the present study consisted of 801 videos (679 of 2015 WCh; 122 of 2016 WCh) that were posted by United World Wrestling (UWW) on their website, along with a multimedia player (laptop) for watching the videos and a chronometer to record the duration of wrestling matches. Data were recorded on specially designed sheets that were prepared in advance. The relative contribution of energy systems in a wrestling match is presented. Moreover, there were some differences between wrestling styles and WCh in respect to relative contribution of energy systems. We determined the quality and quantity of obtained scores by both GR and FS wrestlers. Results showed that FS wrestlers generally catch more scores than GR wrestlers. Additionally, we investigated the placers' competition efficiency, which showed that top wrestlers who won the gold medals also had a better competition efficiency than other placers, and this difference was statistically significant ($p < 0.05$).

Mitchell, J. J., Jackson, J. M., Anwar, A., & Singleton, S. B. (2017). Bacterial sport-related skin and soft-tissue infections (SSTIs): an ongoing problem among a diverse range of athletes. *Jbjs Reviews*, 5(1). doi:10.2106/jbjs.rvw.16.00006

Skin and soft-tissue infections have become increasingly common in the sports world. Recent reports have shown that these infections are prevalent throughout all arenas of sport, and efforts to decrease colonization of bacteria and fungi are now essential for preventing the development of SSTIs. Education on cleansing and hygiene are a vital part of this process, and, as such, the team physician and the team athletic trainers play an important role in the education of the athlete and all members of the athletic team. The impact of SSTIs on individuals and the athletic team may be severe and have the potential for notable consequences, including loss of playing time, hospitalization, and even surgery. Continued efforts to better understand and to prevent the development of SSTIs are paramount.

Montgomery, M., Marttinen, R., & Galpin, A. (2017). Comparison of Body Fat Results from 4 Bioelectrical Impedance Analysis Devices vs. Air Displacement Plethysmography in American Adolescent Wrestlers. *International Journal of Kinesiology and Sports Science*, 5(4), 18-25.

Background: Accurate and accessible methods of body composition are necessary to ensure health and safety of wrestlers during competition. The most valid and reliable instruments are expensive and relatively inaccessible to high school wrestlers; therefore, more practical technology is needed. Objective: To compare body fat percentage (BF%) results from 4 bioelectrical impedance analysis (BIA) devices to those from air displacement plethysmography (ADP) in adolescent wrestlers. Methodology: 134 adolescent male and female wrestlers (1.72 ± 0.9 m, 66.8 ± 14.3 kg, 15.6 ± 1.1 yrs.) were tested for hydration and then completed 4 body composition tests with different BIA devices and one with Bod Pod. Relative and absolute agreement were assessed between each BIA device and ADP on a single day. Results: When compared with ADP, all devices demonstrated excellent reliability (ICC (2,1)) range: 0.88-0.94), but questionable measurement error (SEM range: 2.3-3.6 %BF). Bland-Altman plots revealed that each bioelectrical impedance device we tested over-estimated body fat percent in high school wrestlers (range: 0.8-3.6 %BF) and demonstrated wide 95% limits of agreement (range: 15.020.8 %BF) compared to ADP. Conclusions: The devices investigated demonstrated reasonable measurement accuracy. However, wide margins of error of each device were noted. Caution should be taken when assessing adolescent wrestlers with lower amounts of body fat, as it may result in failing to identify those who do not meet the minimum body fat percentage for competition. The governing bodies should use the research data in the decision-making process regarding appropriate devices for use in their weight management programs.

Morel, D. S., Dionello, C. d. F., Moreira-Marconi, E., Brandao-Sobrinho-Neto, S., Paineiras-Domingos, L. L., Souza, P. L., . . . Bernardo-Filho, M. (2017). Relevance of whole body vibration exercise in sport: a short review with soccer, diver and combat sport. *African journal of traditional, complementary, and alternative medicines: AJTCAM*, 14(4 Suppl), 19-27. doi:10.21010/ajtcam.v14i4S.3

BACKGROUND: Whole body vibration exercise (WBVE) has been used as a safe and accessible exercise and important reviews have been published about the use of this exercise to manage diseases and to improve physical conditions of athletes. The aim of this paper is to highlight the relevance of WBVE to soccer players, divers and combat athletes. MATERIAL AND METHODS: This study was made through a systematic review of publications involving WBVE and the selected sports in two databases (Pubmed and PEDRo). RESULTS: It were identified 10 studies involving WBVE and sports (6 of soccer, 2 of diving and 2 of sport combat) with 156 subjects (80 soccer players, 32 divers and 44 combat athletes), with age from 17 to 44 years old. CONCLUSION: The use of WBVE has proven to be a safe and useful strategy to improve the physical conditions of players of different sports. These findings may have clinical relevance and should be considered as a strategy to be used to try improve the physical conditions of players.

- Müller, J., Müller, S., Stoll, J., Fröhlich, K., Otto, C., & Mayer, F. (2017). Back pain prevalence in adolescent athletes. *Scandinavian Journal of Medicine & Science in Sports*, 27(4), 448-454. doi:10.1111/sms.12664
- The research aimed to investigate back pain (BP) prevalence in a large cohort of young athletes with respect to age, gender, and sport discipline. BP (within the last 7 days) was assessed with a face scale (face 1-2 = no pain; face 3-5 = pain) in 2116 athletes (m/f 61%/39%; 13.3 ± 1.7 years; 163.0 ± 11.8 cm; 52.6 ± 13.9 kg; 4.9 ± 2.7 training years; 8.4 ± 5.7 training h/week). Four different sports categories were devised (a: combat sports, b: game sports; c: explosive strength sport; d: endurance sport). Analysis was described descriptively, regarding age, gender, and sport. In addition, 95% confidence intervals (CI) were calculated. About 168 (8%) athletes were allocated into the BP group. About 9% of females and 7% of males reported BP. Athletes, 11-13 years, showed a prevalence of 2-4%; while prevalence increased to 12-20% in 14- to 17-year olds. Considering sport discipline, prevalence ranged from 3% (soccer) to 14% (canoeing). Prevalence in weight lifting, judo, wrestling, rowing, and shooting were ≥10%; in boxing, soccer, handball, cycling, and horse riding, ≤6%. 95% CI ranged between 0.08-0.11. BP exists in adolescent athletes, but is uncommon and shows no gender differences. A prevalence increase after age 14 is obvious. Differentiated prevention programs in daily training routines might address sport discipline-specific BP prevalence.
- Murray, S. B., Accurso, E. C., Griffiths, S., & Nagata, J. M. (2017). Boys, Biceps, and Bradycardia: The Hidden Dangers of Muscularity-Oriented Disordered Eating. *Journal of Adolescent Health*. doi:https://doi.org/10.1016/j.jadohealth.2017.09.025
- The recognition of eating disorders (EDs) in males represents an ongoing challenge for physicians. This challenge is particularly complex in the case of EDs that are oriented toward muscularity, as opposed to thinness, which current diagnostic criteria do not accommodate. Nevertheless, EDs in males, and muscularity-oriented disordered eating (MODE) in particular, are increasingly prevalent and are likely to be encountered in clinical practice. We report the case of a 16-year-old male who presented with medical instability, requiring hospitalization, in the context of MODE. Importantly, this patient did not meet formal diagnostic criteria for a specific ED, and behavioral symptoms were deemed goal oriented in the context of high school wrestling pursuits. This case highlights the challenges of identifying MODE and the medical risks associated therein. Pediatricians are encouraged to screen for MODE in adolescent males reporting body image concerns.
- Myers, H., Poletti, M., & Butler, R. J. (2017). Difference in Functional Performance on the Upper-Quarter Y-Balance Test Between High School Baseball Players and Wrestlers. *Journal of Sport Rehabilitation*, 26(3), 253-259. doi:10.1123/jsr.2015-0168
- Context: The Upper Quarter Y-Balance Test (YBT-UQ) is a unique movement test where individuals perform at the limits of their stability, requiring the coordination of balance, proprioception, range of motion, and stabilization. It is not yet clear if performance on the YBT-UQ differs between sports with dissimilar emphasis on upper-extremity performance. Objective: To compare performance on the YBT-UQ between wrestlers, whose sport requires some degree of closed-chain activity, and baseball players, whose sport is primarily open kinetic chain in nature. Design: Cross-sectional. Setting: High school preparticipation physical assessment. Participants: 24 healthy high school male wrestlers (mean age 16.12 ± 1.24y) and 24 healthy high school male baseball players (mean age 15.79 ± 1.25 y). Interventions: All subjects performed the YBT-UQ, which requires reaching in 3 directions while maintaining a push-up position. Main Outcome Measures: The variables of interest include the maximum reach in each direction, as well as the composite score. In addition, asymmetries between limbs for each reach direction were compared. Results: Wrestlers performed significantly better than baseball players in the medial direction, inferolateral direction, and in composite scores. In the medial direction, wrestlers exhibited greater scores (P < .01) on both left and right limbs, 10.5 ± 10.2%LL and 9.95 ± 10.2%LL, respectively. Significant differences (P < .01) were also observed in the inferolateral direction, with a difference of 11.3 ± 12.0%LL on the left and 8.7 ± 11.0%LL on the right. Composite scores were higher (P < .01) for the wrestlers, with a difference of 7.0% on the left and 7.1% on the right. Conclusions: This study suggests that wrestlers perform better on the YBT-UQ than baseball players. The findings may suggest sport-specific normative data for the YBT-UQ in high school athletes.
- Mykola, L., Sergii, L., Oleh, K., & Alexander, K. (2017). Performance analysis of freestyle wrestling competitions of the last Olympic cycle 2013-16. *Journal of Physical Education & Sport*, 17(2), 590-594.
- In view of frequent changes of competition rules in freestyle wrestling a timely and systemic analysis of the competitive activity is a relevant task of the high-level sport. The research objective is to study the dynamics of characteristics of the competitive activity at world championships and the Olympic Games in freestyle wrestling over the period of 2013-16 Olympic cycle, to reveal development tendencies and to draw conclusions about the influence of the new competition rules. It is shown that wrestling rules changes (2013) have entailed the increase in activity, performance level and competition among wrestlers. Thus, the mean number of scored points per wrestler per match had gradually increased from 4.42 in 2013 to 4.72 points per match in 2015 and made up 0.93 pts/min on average. The number of matches with victory by superiority at world championships (2013-15) averaged 18%, while at the 2016 Olympic Games the figure was only 11.7%. Olympic wrestlers have a similar level of qualification than world championship wrestlers. On the whole, the positive dynamics of performance, activity and impressiveness of matches as a result of the competition rules changes is confirmed.

Na, Y.-I. (2017). Cultural Anthropological Origin of Korean Wrestling Ssireum. [한민족 씨름의 문화인류학적 기원]. *Korean Journal of History of Physical Education, Sport and Dance*, 22(1), 1-19.

This study reveals the cultural anthropological origins of Korean wrestling Ssireum. For this purpose, where and when the Korean wrestling came from the western area, it is revealed through specific relics and analyzed the characteristics of Korean wrestling. The result is, firstly, that Korean wrestling Ssireum certainly came through the western part because it would not be possible to record them on the tomb wall without seeing the westerner. And Ssireum was introduced that the two empires, Han(漢) and Huns(匈奴) were divided and weakened and during peace period of another two empires, Rome and Persia. Second, in the documentary records, Ssireum which is called the Gakjeo(角觝) introduced in Buyeo(夫餘) at AD 136. Gakjeo has been popular in China since BC, and it has been applied to Goguryeo(高句麗). Third, the characteristic of Korean wrestling Ssireum is a belt called Satba. In ancient Egypt and Greece and Iran and India, there is a form of belt wrestling.

Naka, T., Kanno, M., Shidochi, S., Sakae, K., & Shima, N. (2017). Characteristics of upper-limb pull power and power endurance in Japanese female wrestlers. *Journal of strength and conditioning research*. doi:10.1519/jsc.0000000000002378

This study aimed at elucidating the characteristics of upper-limb physical strength required by female wrestlers by comparing the pull power, power endurance, and number of repetitions between female wrestlers at world and national levels. The subjects were 20 female wrestlers (8 Olympic- and/or world-class and 12 national-class top-ranking individuals). The subjects assumed a lying prone (face down) position on a bench and pulled a bar from arm's length until contact with underside of bench. The weight load was increased in 10-kg steps and the upper-limb pull power was measured for each lift. To measure power endurance, the power to achieve the repetition maximum and the maximum number of repetitions were measured at the load at which they exerted their maximum power. All measurements were obtained using a GymAware power meter (Kinetic Performance Technology, Canberra, Australia). Pull power was greater at 20, 30, 40 and 50 kg in world-class wrestlers than in national-class wrestlers. No difference was observed in the time course of power endurance between the groups; however, the power in world-class wrestlers declined slower than in national-class wrestlers. Repetition maximum also tended to be higher in world-class wrestlers than in national-class wrestlers. Female wrestlers were observed to have greater upper-limb pull power in a range from low to high loads and were able to preserve repetition ability while maintaining high power. Their competitive performance appears to be related to these abilities.

Nakagawa, Y., Mukai, S., Minami, K., Hattori, Y., & Nakamura, T. (2017). Radiological Changes in the Cervical Spine in Freshman Collegiate Sumo Wrestlers. *Orthopaedic Journal of Sports Medicine*, 5(12), 5. doi:10.1177/2325967117744210

Background: Sumo has long been a traditional sport in Japan and is rapidly attracting enthusiasts abroad. Sumo wrestling entails a risk of impact to the cervical spine during an initial charge. Few reports are available in the English-language literature regarding radiological changes in the cervical spine in sumo wrestlers. Purpose: To examine radiological changes in the cervical spine in freshmen collegiate sumo wrestlers. Study Design: Case series; Level of evidence, 4. Methods: A total of 53 freshmen sumo wrestlers (age, 18-19 years) who belonged to the Japan Sumo Federation underwent routine radiographic examination of the cervical spine and completed questionnaires on cervical symptoms. Results: Of the 53 wrestlers, 81% showed loss of lordosis, 45% showed osteophyte formation (mainly at C3-C4), 11% showed disc space narrowing (mainly at C5-C6), and 51% showed narrowing of the cervical nerve root foramina (mainly at C3-C4). Fifty-one percent had some cervical symptoms. A correlation was found between deformity of the cervical bodies (such as intervertebral disc ballooning) and cervical symptoms, but no correlation was found between cervical degenerative changes and cervical symptoms. Conclusion: Our data suggest that loss of lordosis, osteophyte formation, and narrowing of the cervical nerve root foramina at C3-C4 were frequently present in freshmen wrestlers and may be due to the axial load incurred prior to their collegiate careers.

Naoki, K., Shingo, M., Noriyuki, F., Ryutaro, M., Haruka, M., Motohiko, M., & Koichi, N. (2017). The Association Between MCT1 T1470A Polymorphism and Power-Oriented Athletic Performance. *International Journal of Sports Medicine*, 38(1), 76-80. doi:10.1055/s-0042-117113

The purpose of this study was to investigate the effects of the MCT1 T1470A polymorphism (rs1049434) on power-oriented performance and lactate concentration during or after cycling sprints in Japanese wrestlers. Participants (199 wrestlers and 649 controls) were genotyped for the MCT1 T1470A genotype (rs1049434) using the TaqMan® Assay. All wrestlers were international (n = 77) or national (n = 122) level athletes. Among them, 46 wrestlers performed 2 anaerobic performance tests, a 30-s Wingate Anaerobic test (WAnT) and a series of 10 maximal effort 10-s sprints on a cycle ergometer. Blood lactate levels were measured before, during, and after the tests. In the A-allele recessive model (AA vs. TA+TT), the frequency of the AA genotype was significantly higher in all wrestlers than in controls (p = 0.037). Wrestlers with AA genotype had lower blood lactate concentrations than those with TA + TT genotype at 10 min after the WAnT and following the 5th and the final set of repeated cycling sprints (p<0.05). The AA genotype of the MCT1 T1470A polymorphism is over-represented in wrestlers compared with controls and is associated with lower blood lactate concentrations after 30-s WAnT and during intermittent sprint tests in Japanese wrestlers

Narayana Kurup, J. K., Jampani, R., & Mohanty, S. P. (2017). Catastrophic cervical spinal injury in an amateur college wrestler. *BMJ case reports*, 2017. doi:10.1136/bcr-2017-220260

A young amateur wrestler presented with a burst fracture of the seventh cervical vertebra with complete paraplegia. He was treated with surgery for spine stabilisation and was actively rehabilitated. Adolescents and teenagers are indulging in high-contact sports like wrestling, without proper training and technical know-how, which can lead to severe injuries and possibly, permanent handicap or death. Trainers, assistants and institutions should be well equipped to diagnose and provide initial care of people with a spinal injury to prevent a partial injury from progressing to complete injury. Athletes, coaches and the public should be aware of methods of first aid and how to transport a patient with a cervical spine injury. Authorities should take steps to improve infrastructures in training institutions and ambulance services. Specialised spinal centres should be established throughout the country for management and rehabilitation of patients with paraplegia.

- Ngom, G., Mohamed, A. S., Mbaye, P. A., Fall, M., Ndour, O., Faye, A. L., & El-Hasnaoui, Z. (2017). Wrestling game injuries among children in Dakar: a report on 172 cases. *Pan African Medical Journal*, 26. doi:10.11604/pamj.2017.26.150.7961
Introduction: The objective was to report epidemiological and lesional features among children practicing wrestling as a game in Dakar, Senegal. Methods: It was a retrospective study including all patients under 16, victims of wrestling game injuries. We studied epidemiological and lesional aspects in children: frequency of wrestling game injuries among all games, age, sex, geographic origin, place of injury, parent's socioeconomic status, nature of the injury and location. Results: Wrestling game injuries represented 19.9% injuries in all games. Sex-ratio was 33.4. The most affected age group was the 6-10 years old age group. The majority of children are from suburban Dakar (64%). Injuries occurred most often at home and in the street. Most children are from low socioeconomic status (64%). Fractures predominated and were localized almost exclusively on the elbow. Conclusion: Wrestling game injuries in Dakar occur among older children from the suburbs, living in the neighborhood of great wrestling champions' districts of residence. Wrestling game cause injuries, consisting mostly of elbow fractures.
- Nikooie, R., Cheraghi, M., & Mohamadipour, F. (2017). Physiological determinants of wrestling success in elite Iranian senior and junior Greco-Roman wrestlers. *Journal of Sports Medicine & Physical Fitness*, 57(3), 219-226. doi:10.23736/S0022-4707.16.06017-5
BACKGROUND: Fitness profile and the physiological determinants of wrestling success in Greco-Roman wrestlers were investigated. METHODS: The wrestlers from the Iranian National Greco-Roman Team (14 junior wrestlers and 12 senior wrestlers) participated in this study. The junior and senior wrestlers were divided into two groups of successful and less successful athletes based on their performance during the previous wrestling season. The wrestlers were evaluated for anthropometric measurements, flexibility, muscular endurance, explosive power, peak and mean power of upper and lower limbs, cardiovascular endurance, running speed, agility, and muscular strength. RESULTS: In senior wrestler, significant differences in favor of the successful wrestlers were found for relative grip strength ($P < 0.01$), pull-ups ($P < 0.01$), peak and mean anaerobic power of upper limbs ($P < 0.05$), and oxygen consumption (O_2) corresponding to ventilatory threshold (VT). The results of discriminant analysis revealed that the relative grip strength, pull-ups, and mean anaerobic power were the most important variables separating the groups. In junior wrestlers, the successful wrestlers had significantly more relative grip strength ($P < 0.01$), pull-ups ($P < 0.01$), peak and mean anaerobic power of upper limbs ($P < 0.05$), and peak anaerobic power of lower limbs ($P < 0.05$). However, the results of discriminant analysis showed that the model could not successfully determine group membership. CONCLUSIONS: In summary, muscular strength, muscular endurance, and anaerobic capacity are the most important variables in Greco-Roman wrestling and athletes must pay particular attention to improving these variables to be a successful wrestler.
- Nonga Nonga, J.B., Binyame B., Curby D.G., (2017). Cameroonian wrestlers at the Olympic games and world championships from 1980 to 2016. *International journal of wrestling science*, 7(1).
The study aims to show the incidence of participation of Cameroonian wrestlers in international events (Olympics Games and World championships) in the development of Olympic wrestling styles in Cameroon, and the level of Cameroonian wrestler's performances. The research sample was purposefully chosen from the Cameroonian wrestlers participating in Olympic and world championships from 1980 to 2016 in accordance with the United World Wrestling (UWW) Database. The main results shown that: The rate of participation of Cameroonian wrestlers in international events is just an indicator (between many others) of the development of Olympics wrestling styles in Cameroon. Due to many factors, the participation of Cameroonian wrestlers in the Olympic Games and world championships between 1980 and 2016, cannot gauge the performance level of Cameroonians wrestlers reliably, but it enables us to see the increasing participation of Cameroonian female wrestlers in international competition, and also the lagging participation of Cameroonian male wrestlers (freestyle and Greco-Roman)
- Nowoisky, C., Lüdemann, R., Kindler, M., Gruhne, R., Büchel, M., Wehrmann, M., Büsch, D. (2017). Development and implementation of a test device for the recording of sports specific performance in wrestling. In I. Fichtner (Ed.), *Technologien im Leistungssport* (pp. 38-44). Aachen, Germany: Meyer & Meyer Sport.
- Obmiński, Z., Supiński, J., Mroczkowska, H., Borkowski, L., & Zdanowicz, R. (2017). Wpływ wydolności aerobowej na ostre zmiany funkcji poznawczych i stężeń hormonów we krwi po wyczerpującym wysiłku. / the effect of aerobic fitness on acute changes in

cognitive functions and blood hormones levels after an exhaustive effort. *Polish Journal of Sports Medicine / Medycyna Sportowa*, 33(2), 97-106.

Background. We assume, that various task structures of combat sports and non-contact endurance sports may be responsible for differences in the levels of cognitive performance at rest and directly after a strenuous exercise. To do so, we compared visuo-motor abilities before and after an exhaustive exercise test in endurance-trained (triathlon) -and velocity-trained (karate) male athletes. Material and methods. karate athletes (n=14) and triathlon practitioners (n=17) were subjected to a laboratory ergometry incremental test performed until volitional exhaustion. Capillary blood was sampled in the morning (7:30) and pre and post exercise, for determination of serum hormones. Both groups executed an incremental ergometry exercise test until volitional exhaustion. Two type of visuopsychomotor tests, i.e. multiple choice time response (MTR) and GO/NOGO task determining the level of cognitive and executive functions: perception vigilance, time and accuracy of decision-making and eye-hand coordination were administered at three time points, before the exercise (-15 min), at 4th and 30th minute after it. Results. Triathlon athletes showed significantly higher VO₂max (68.32±7.0 l/min/kg) than karate players (52.1±7.2 l/min/kg), but worse levels of psycho-motor abilities. Morning serum testosterone was significantly higher in karate (25.0±3.7 mM) as compared to the triathlon group (19.8±4.1 mM) Significant improvement for three successive MTR attempts, but not for GO/NOGO tasks was observed for pooled data. Conclusions. Various sporting task structures affect the level of physical fitness and psycho motor abilities. The improvement of repeated MTR attempts may result in psychomotor learning effect and/or exercise-induced excitation of the central nervous system.

Osipov, A., Kudryavtsev, M., Fedorova, P., Serzhanova, Z., Struchkov, V., Glinchikova, L., . . . Kuzmin, V. (2017). Comparative analysis of the scientific views of Russian and foreign scientists on the problem of training skilled judo wrestlers. *Journal of Physical Education & Sport*, 17(1), 288-293.

We performed a comparative analysis of the scientific views of Russian and foreign scientists on the training activities of judo. Results were taken from scientific research performed by Russian and foreign scientists over the last 12 years. Using a structural analysis of important research work (articles and dissertations), we identified the main research directions of Russian scientists. We compared the results obtained with the scientific ideas of foreign experts. Our comparative analysis of the data showed that for some areas of wrestler training the views of Russian and foreign scientists significantly differ. There is a significant divergence of scientific views between Russian and foreign specialists in the sport of judo. This involved the problems of training athletes for competitive activities and the principles for selecting children and youths for judo during the initial stage of judo preparation.

Otero, J. E., Graves, C. M., & Bollier, M. J. (2017). Injuries in Collegiate Wrestlers at an Elite Division I NCAA Wrestling Program: An Epidemiological Study. *The Iowa orthopaedic journal*, 37, 65-70.

BACKGROUND: Injury is common in the sport of wrestling. More than 6000 athletes compete in NCAA wrestling yearly. Despite this popularity, little is known about the epidemiology of wrestlers' injuries and factors affecting return to competition. We hypothesized that patterns of injury and associated factors influence return to participation. METHODS: Retrospective database review of one Division I NCAA wrestling program over nine seasons (2002 to 2011). RESULTS: From 2002 to 2011, 125 wrestlers were varsity participants at a single NCAA Division I program. Among these wrestlers, there were 4275 exposures per year on average. We identified 1034 musculoskeletal injuries, skin injuries, and concussions in 120 athletes (96% of participants). Eighty-two percent of athletes missed at least one day secondary to these injuries, while 69% were unable to compete in at least one match. The injury rate was estimated at 19.6 (SD 16.5) per 1000 exposures. The rate of injuries requiring surgery was estimated at 1.4 (SD 2.1) per 1000 exposures. Weight class, record, age at injury, and eligibility status did not affect the rate or type of injury. A significant difference was noted in the athletes who returned to competition following surgery. Athletes who returned to competition after surgical treatment for an injury ultimately competed in more matches (62.4 vs 18.2, $p < 0.001$), had more wins (45.2 vs 12.1, $p < 0.001$) and a higher win percentage (67.5 vs 51.2 $p < 0.01$) than those who did not return following surgery. CONCLUSION: Return to competition in collegiate wrestling is dependent on many factors in addition to severity of injury and surgery type. There is a positive association between return to sport and success as a collegiate wrestler. Our findings will be helpful to wrestlers and coaches in guiding expectations after injury. Level of Evidence: Level 4 diagnostic.

Oztasyonar, Y. (2017). Interaction between different sports branches such as taekwondo, box, athletes and serum brain derived neurotrophic factor levels. *Journal of Sports Medicine & Physical Fitness*, 57(4), 457-460. doi:10.23736/S0022-4707.16.06070-X

BACKGROUND: This study aimed to compare serum brain-derived neurotrophic factor (BDNF) levels "which contributes in both neuron development/regeneration" between combat sport braches, which requires high attention and concentration and can lead micro and macro brain trauma, and athleticism, which requires durability in competition. METHODS: The study design included 4 groups. Group 1 had sedentary participants, and group 2 athletes (middle and long runners) who exercised for two 2-hour daily training sessions 6 days a week, group 3 included boxers, and group 4 taekwondo fighters. We investigated changes in the blood BDNF levels of taekwondo fighters, boxers, and athletes before and after training and compared them among each other and with measurements of sedentary controls. RESULTS: All athletes had higher basal BDNF levels than sedentary participants. Boxers and taekwondo athletes had especially high basal BDNF levels. When we compared different sports branch each other Pre- and post- training BDNF values are ranked as follows: taekwondo > boxing > athletes >

sedentary. In sport branches such as combat sports and athletes, serum BDNF levels have been demonstrated to be higher after training than before. In addition, serum BDNF levels were higher in taekwondo fighters and boxers than athletes. CONCLUSIONS: BDNF might have a role in the protection mechanism against brain damage or contributes in occurrence and maintenance of high attention and concentration especially among combat sports.

Papadopoulou, S. K., Dalatsi, V. A., Methenitis, S. K., Feidantsis, K. G., Pagkalos, I. G., & Hassapidou, M. (2017). Nutritional Routine of Tae Kwon Do Athletes Prior to Competition: What Is the Impact of Weight Control Practices? *Journal of the American College of Nutrition*, 36(6), 448-454. doi:10.1080/07315724.2017.1319305 Objective: The purpose of the present study was to investigate and assess the common dietary and weight management strategies of Tae Kwon Do (TKD) athletes prior to national competitions, as well as to examine the relationships between these strategies and body weight reduction and sensation of physical condition. Methods: Sixty (n D 60) TKD athletes, 23 women (19.4 § 2.9 years) and 37 men (20.4 § 3.6 years), with at least 12.1 § 3.1 years of experience, participated in the present study. The athletes recorded their dietary intake and physical activity for 3 training days and on a competition day. Bioelectrical impedance was used for body composition estimation. Results: Male athletes consumed 1918 § 685 kcal/24 hours and 1974 § 669 kcal/24 hours on training and competition days, respectively, and women 1814 § 446 kcal/24 hours and 1700 § 439 kcal/24 hours. TKD athletes had significant negative energy balance (48.6% § 17.8% to 60.3% § 26.9%; p < 0.05), with the majority of macro- and micronutritional elements being lower than the recommended values, with significant differences between them, as well as within groups, between weekdays and weekend days (p < 0.05). Females lost most of their weight 2 weeks before the games (3.50 § 1.00 kg), and males lost most of their weight 3 weeks before (3.16 § 2.48 kg). The majority of TKD athletes were guided by their coaches for weight management strategies. No significant correlations were found between any body composition variable, weight loss, and any nutritional intake at any time point (p > 0.05). Conclusions: These data suggest that the methods of TKD athletes for rapid weight loss are guided by unspecialized professionals, leading to significant malnutrition, because certain deficiencies in both macro- and micronutrient content are present, with no guaranteed specific reduction of their body mass.

Park, S., Kim, Y., ChangHoon, S. (2017). The conceptual exploration of fear and courage in competition among national combat sport athletes. [국가대표 투기종목 선수들의 시합 두려움과 용기의 개념 탐색]. *Korean Journal of Sport Science*, 28(3), 712-723. doi:10.24985/kjss.2017.28.3.712 [Purpose] This study was to explore construct of fear and courage behavior overcoming the fear and relationship between fear and courage in competition. [Methods] Total 65 national athletes of combat sports (Judo, Boxing, Taekwondo, Fencing) responded to open questionnaire about fear and courage behavior in competition. The data was analyzed by triangle verification and content analysis. [Results] Firstly, the fear of combat sports athletes consisted of five factors, which were negative consequences, lack of preparation for a game, concerns of performing one's best, expectation of significant others, and internalized ego threat. Secondly, courage behaviors to overcome fear were self-effort, self-suggestion, self-conviction, selfish self-regulation, social self-control, self-analysis, and acceptance of experience. Finally, there were the relationship between fear and courage in competition. [Conclusion] These results will contribute to provide useful information for combat sport athletes and coaches in different level to cope with competition fear.

Pearn, M., Niesman, I., Egawa, J., Sawada, A., Almenar-Queralt, A., Shah, S., . . . Head, B. (2017). Pathophysiology Associated with Traumatic Brain Injury: Current Treatments and Potential Novel Therapeutics. *Cellular & Molecular Neurobiology*, 37(4), 571-585. doi:10.1007/s10571-016-0400-1 Traumatic brain injury (TBI) is one of the leading causes of death of young people in the developed world. In the United States alone, 1.7 million traumatic events occur annually accounting for 50,000 deaths. The etiology of TBI includes traffic accidents, falls, gunshot wounds, sports, and combat-related events. TBI severity ranges from mild to severe. TBI can induce subtle changes in molecular signaling, alterations in cellular structure and function, and/or primary tissue injury, such as contusion, hemorrhage, and diffuse axonal injury. TBI results in blood-brain barrier (BBB) damage and leakage, which allows for increased extravasation of immune cells (i.e., increased neuroinflammation). BBB dysfunction and impaired homeostasis contribute to secondary injury that occurs from hours to days to months after the initial trauma. This delayed nature of the secondary injury suggests a potential therapeutic window. The focus of this article is on the (1) pathophysiology of TBI and (2) potential therapies that include biologics (stem cells, gene therapy, peptides), pharmacological (anti-inflammatory, antiepileptic, progrowth), and noninvasive (exercise, transcranial magnetic stimulation). In final, the review briefly discusses membrane/lipid rafts (MLR) and the MLR-associated protein caveolin (Cav). Interventions that increase Cav-1, MLR formation, and MLR recruitment of growth-promoting signaling components may augment the efficacy of pharmacologic agents or already existing endogenous neurotransmitters and neurotrophins that converge upon progrowth signaling cascades resulting in improved neuronal function after injury.

Pedro, S., & Martins, P. (2017). Engagement and injuries in wrestling athletes. *International journal of wrestling science*, 7(1): 1-8. The study of psychological factors and their relationship with injuries in wrestlers is new field of research. Specifically, this study focuses on athletes' engagement and its association with injuries. We characterize other factors like training loads, total number of injuries, topography, and other symptoms. Thirty-five wrestlers from different ages and competitive levels respond

to Athletes Engagement Questionnaire and demographic inquiry. Results indicate no association between wrestlers' overall engagement and total number of injuries. However, total number of injuries is associated with symptoms resulting from injury states, such as physical, behavioral, and psychological. We also give some guidelines regarding prevention and promotion of healthier wrestling experiences.

Pedro, S., & Martins, P. (2017). Suporte de autonomia, empenhamento e percepção subjetiva de esforço em lutadores. Autonomy support, engagement and perceived effort exertion in wrestlers., *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 12(2), 279-286.

The Coach-Athlete relationship is an essential aspect for athlete's performance and sports experience. This is an even more important relationship in an individual sport as wrestling. Coaches' autonomy support is determinant to athlete's dedication and effort. Also, athlete's engagement is a main reason for their sports continuity. This study aims to understand the relationship between coaches' autonomy support and athletes' engagement and also their relationship with the perceived effort exertion in wrestling. 20 wrestlers participated in this study [(nmale = 18; nfemale = 2), (Mage = 17.8; S = 1.96), (Mtime of practice = 5.3; SD = 4.34) from the age groups of Juniors (8) and Seniores = 12). To compare the mean of dichotomy variables we used the Mann-Whitney U, to calculate the association between variables we used the Spearman Correlation Coefficient. Results show that autonomy support is positively associated to athlete's engagement (rAsup x Eng = .74; p = .01), and engagement is related to perceived effort exertion (rEng x Perc.Eff = .56; p = .05), specifically to vigor dimension. Results are discussed in in two aspects: athletes' performance and coaches' intervention.

Petri, K., Lichtenstein, M., Bandow, N., Campe, S., Wechselberger, M., Sprenger, D., . . . Witte, K. (2017). Analysis of anticipation by 3D motion capturing – a new method presented in karate kumite. *Journal of Sports Sciences*, 35(2), 130-135.

Anticipation is an important performance factor in karate kumite. A new approach analysing anticipation in realistic combat situations by motion capturing with a high temporal resolution is presented. The advantage of this approach is that both karate athletes interacting sports specific can be recorded synchronously; thus, the presented method has the potential to analyse visual information pickup due to coordination pattern of interaction between real athletes. The aim is to demonstrate the usability of the current method for anticipation research and to investigate if the distance between two athletes and their attacking technique play a role in the reaction of the defending athlete. Furthermore, relevant cues lying within each attacking technique and little individual differences are shown. Four male karate athletes took part in this study. Logistic regression indicated that both factors (distance x attacking technique) play a significant role in reaction. However, a correlation between these factors shows that only the attacking technique is a good predictor for reaction. Results show that the attacking technique jabbing punch (jap. Kizami-Zuki) was easier to anticipate than the attacking techniques reverse punch (jap. Gyaku-Zuki) and the round kick (jap. Mawashi-Geri).

Petrochenko, S. N., Bobrova, Z. V., Myagkova, M. A., Spasskiy, A. A., Ledovskoy, S. M., Il'ina, A. K., & Mikhailov, A. A. (2017). The detection of antibodies to endogenous bio-regulators for evaluating functional condition of health of sportsmen. [ОПРЕДЕЛЕНИЕ АНТИТЕЛ К ЭНДОГЕННЫМ БИОРЕГУЛЯТОРАМ ДЛЯ ОЦЕНКИ ФУНКЦИОНАЛЬНОГО СОСТОЯНИЯ ЗДОРОВЬЯ СПОРТСМЕНОВ]. *Klinicheskaya laboratornaya diagnostika*, 62(6), 346-350. doi:10.18821/0869-2084-2017-62-6-346-350

The evaluation of functional condition of health of sportsmen doing Greek Roman wrestling was implemented using detection of level of antibodies to serotonin, histamine, dopamine, glutamate, GABA, orphanine, endorphin, angiotensin. The study established a reliable increasing of level of antibodies to orphanine, beta-endorphin, GABA and glutamate under increasing of duration of physical load. The content of antibodies to other regulators of adaptation had no statistical difference. The developed technique can be applied in evaluation of objectification of functional condition of sportsman with purpose of selecting optimal training process.

Оценку функционального состояния здоровья спортсменов, занимающихся греко-римской борьбой, проводили определением уровня антител к серотонину, гистамину, дофамину, глутамату, ГАМК, орфанину, beta-эндорфину, ангиотензину. Установлено достоверное повышение уровня естественных антител к орфанину, beta-эндорфину, ГАМК и глутамату при увеличении длительности физической нагрузки. Содержание антител к другим регуляторам адаптации статистически не различалось. Разработанный метод можно использовать в оценке объективизации функционального состояния здоровья спортсмена для выбора оптимального тренировочного процесса.

Pintos-Figueroa, P. R., Carballeira-Fernandez, E., Dopico-Calvo, X., Castro-Seoane, I., Castro-Seoane, N., Iglesias-Soler, E. (2017). *Characterization of specific effort in female wrestlers: lactacidemia, FC, VFC and rate of perceived effort (BORG)*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia. The characterization of the effort will mark the lines of work. Heart Rate Variability (HRV) is the result of interactions between the autonomic nervous system-SNA- (with its sympathetic-vagal balance) and the cardiovascular system. The relationship between Lactate and Borg values is directly related to the literature. The PURPOSE of this work was to describe and characterize the effort during an Olympic Fights match and to relate the analyzed parameters. METHODS: 9 female wrestlers (n=9), members of the national wrestling team in the cadet and junior categories (age n=16,33, SD=0;71), were the object of

study, during 3 days of testing. All subjects performed the same tests: first day recording baseline HR, second day baseline HR recording and a standardized training with a real monitored Olympic Wrestling match. The third day: baseline HR recording. With all this we obtained the values of VFC, Lactate and Borg scale during the confrontation. The time constant of the approximation of heart rate recovery was also analyzed by an interactive monoexponential regression process. RESULTS: The Lactate peak was at minute 3 (Mean: 14.03 mmol / l and SD: 3.5). The values of the BORG scale were higher at the end of the second round ($p < 0.001$). High and significant correlations were detected between the perception of effort and lactacidemia ($p < 0.005$) in all cases; CONCLUSIONS: A high glycolytic involvement in the Olympic wrestling match is confirmed. The Borg scale can be a useful tool for monitoring the intensity of combat. A single confrontation is insufficient to generate changes in HRV.

Piskin, I. E., Gumus, M., Bayraktaroglu, T., Akalin, T. C., & Yamaner, F. (2017). Growth and pubertal development in adolescent male wrestlers. *The Journal of sports medicine and physical fitness*. doi:10.23736/s0022-4707.17.07269-3

BACKGROUND: Adolescence is a crucial period for linear growth, and sports training during this time may have positive or negative effects on some physiological processes as growth. The purpose of this study was to evaluate the effects of intense training during somatic growth on the onset of puberty and growth development in adolescent wrestlers. METHODS: Fifty adolescent male wrestlers and twenty-one sedentary healthy male controls aged between 13-15 years were selected. The wrestlers were from five different wrestling schools and were active at competitive level. The maturity status of the subjects and data about the anthropometric characteristics including age, body weight, height, and body mass index (BMI) were evaluated. Serum testosterone, dehydroepiandrosterone sulphate (DHEA- S), follicle stimulating hormone (FSH), luteinizing hormone (LH), prolactin, cortisol, insulin like growth factor-1 (IGF-1), thyroid stimulating hormone (TSH) and free thyroxin (fT4) were determined. RESULTS: Anthropometric characteristics and puberty levels according to the Tanner stage were similar in both groups. There were no significant differences between wrestlers and sedentary control groups in sex hormones, cortisol, IGF-1, prolactin levels ($p > .05$) but TSH concentrations differed significantly ($p = .015$). CONCLUSIONS: The results suggested that training in adolescent male wrestlers did not significantly change resting sex hormones or alter the onset of puberty as determined by assessment of pubertal stages. The wrestlers had lower body fat and greater energy expenditure per week, there were no significant differences in height, weight, or body mass index.

Pour, M. F. (2017). The relationship of coping Strategies of (facing) stress and the source of control (inner/ outer) with the sport success in wrestling athletes in Kermanshah state. *International Journal of Advanced Biotechnology and Research*, 8(2), 1472-1474.

the aim of this study is to investigate the relationship of the ways of facing stress and the source of control (inner/ outer) with the sport success in wrestling athletes in Kermanshah state. the method is descriptive-correlation and is applicational regarding the end. The samples are all of the wrestling athletes in Kermanshah who were chosen among those having the experience of three years championship formally but because of number limitation, the all (55) were chosen. to collect data CISS questionnaire of facing stress of Andler & Parkler (1990) was used. Besides, the control questionnaire of Rater (1986) and standard of sport success of Besharat (1384) was used. The validity of them was acceptable in the specialist opinion. The stability of questionnaires the Cronbach – alpha (%83-80%) was used. For analyzing data the descriptive Statistics and deductive was used SPss software. The findings showed that among the ways of facing stress, the way of having question has the most correlation with sport success. the inner source of control with the correlation of % 452 has the more effect.

Raschka, C., & Mueller, J. (2017). Sports anthropological and somatotypical comparison between male wrestlers and hapkidoin of different performance levels. *Papers on Anthropology University of Tartu*, 26(1), 52-63. doi:10.12697/poa.2017.26.1.04

The present study compares the anthropometry and somatotyping of $n = 40$ healthy male wrestlers (age range 15-37 years) and $n = 40$ Hapkidoin (age range 23-29 years) with respect to various performance categories. On average, the mean age of wrestlers was lower, compared to hapkidoin. The wrestlers of both performance classes are considerably smaller (mean height 170 cm) than the hapkidoin (high performance class 176.5 cm, lower performance class 180 cm). When comparing the weight classes of the wrestlers, the average body height increases continuously with increasing weight class in conjunction with most other anthropometric parameters. In the chessboard pattern graphic to Conrad, the hapkidoin appear rather moderately pyknomorphic as well as slender, the wrestlers are moderately leptomorphic and metrosome as well as smaller. In Parnell's somatochart, the wrestlers have an average somatotype of 5 - 3 - 3, the hapkidoin of 5 - 3 - 4. In the somatochart of Heath & Carter, an average somatotype of 6 - 3 - 2 is shown for both combat sport collectives, whereby the wrestlers tend to the endomorphic axis.

Rashidlamir, A., Bagheri, R., Akbari, M. (2017). *Effect of a two-week beta-alanine supplementation on plasma carnosine and lactic acid in trained-wrestlers*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

PURPOSE: Some studies have reported that -alanine supplementation can increase high-intensity intermittent exercise performance and training adaptations. In this study, we investigated the effect of -alanine on lactate acid and carnosine in trained wrestlers. METHODS: 19 trained-wrestlers (mean age \pm SD 22.52 \pm 2.31 yrs. height 173.38 \pm 4.86 cm, weight 76.22 \pm 9.07 kg) participated in this design and randomly divided into supplementation (s) and placebo (P) groups. S group consumed 1000

mg -alanine and P group consumed placebo for 2 weeks. Blood samples were taken, before the first and 6 minutes after the last HIIT test for detection of plasma lactate and carnosine. SPSS software and independent t-test method were used for analyzing data ($p < 0.05$). RESULTS: The S group, taking -alanine, showed a significant decrease in lactic acid ($p = 0.00$) and a significant increase in carnosine plasma ($p = 0.02$), While these changes weren't observed in the P group. CONCLUSION: According to the results, -alanine supplementation for 2 weeks may be associated with increase buffering system via an increase in carnosine and decrease lactic acid during high-intensity interval training in wrestlers. We recommend that -alanine supplementation may be useful for wrestling athletes.

Reale, R., Cox, G. R., Slater, G., & Burke, L. M. (2017). Weight Regain: No Link to Success in a Real-Life Multiday Boxing Tournament. *International journal of sports physiology and performance*, 12(7), 856-863. doi:10.1123/ijsp.2016-0311
PURPOSE: Combat-sport athletes acutely reduce body mass (BM) before weigh-in in an attempt to gain a size/strength advantage over smaller opponents. Few studies have investigated these practices among boxers and none have explored the impact of this practice on competitive success. METHODS: One hundred (30 women, 70 men) elite boxers participating in the Australian national championships were weighed at the official weigh-in and 1 h before each competition bout. Regain in BM after weigh-in was compared between finalists and nonfinalists, winners and losers of each fight, men and women, and weight divisions. Boxers were surveyed on their pre- and post-weigh-in nutrition practices. RESULTS: The lightest men's weight category displayed significantly greater relative BM regain than all other divisions, with no difference between other divisions. BM prebout was higher than official weigh-in for men ($2.12\% \pm 1.62\%$; $P < .001$; $ES = 0.13$) and women ($1.49\% \pm 1.65\%$; $P < .001$; $ES = 0.11$). No differences in BM regain were found between finalists and nonfinalists, winners and losers of individual bouts, or between preliminary or final bouts. BM regain was significantly greater ($0.37\% \text{ BM}$, $P < .001$; $ES = 0.25$) before an afternoon bout compared with a morning bout. CONCLUSIONS: Boxers engage in acute BM-loss practices before the official competition weigh-in, but this does not appear to affect competition outcomes, at least when weight regain between weigh-in and fighting is used as a proxy for the magnitude of acute loss. While boxers recognize the importance of recovering after weigh-in, current practice is not aligned with best-practice guidance.

Reale, R., Slater, G., & Burke, L. M. (2017). Acute-Weight-Loss Strategies for Combat Sports and Applications to Olympic Success. *International Journal of Sports Physiology & Performance*, 12(2), 142-151.
It is common for athletes in weight-category sports to try to gain a theoretical advantage by competing in weight divisions that are lower than their day-to-day body mass (BM). Weight loss is achieved not only through chronic strategies (body-fat losses) but also through acute manipulations before weigh-in ("making weight"). Both have performance implications. This review focuses on Olympic combat sports, noting that the varied nature of regulations surrounding the weigh-in procedures, weight requirements, and recovery opportunities in these sports provide opportunity for a wider discussion of factors that can be applied to other weight-category sports. The authors summarize previous literature that has examined the performance effects of weightmaking practices before investigating the physiological nature of these BM losses. Practical recommendations in the form of a decision tree are provided to guide the achievement of acute BM loss while minimizing performance decrements.

Reale, R., Slater, G., & Burke, L. M. (2017). Individualised dietary strategies for Olympic combat sports: Acute weight loss, recovery and competition nutrition. *European journal of sport science*, 17(6), 727-740. doi:10.1080/17461391.2017.1297489
Olympic combat sports separate athletes into weight divisions, in an attempt to reduce size, strength, range and/or leverage disparities between competitors. Official weigh-ins are conducted anywhere from 3 and up to 24 h prior to competition ensuring athletes meet weight requirements (i.e. have 'made weight'). Fighters commonly aim to compete in weight divisions lower than their day-to-day weight, achieved via chronic and acute manipulations of body mass (BM). Although these manipulations may impair health and absolute performance, their strategic use can improve competitive success. Key considerations are the acute manipulations around weigh-in, which differ in importance, magnitude and methods depending on the requirements of the individual combat sport and the weigh-in regulations. In particular, the time available for recovery following weigh-in/before competition will determine what degree of acute BM loss can be implemented and reversed. Increased exercise and restricted food and fluid intake are undertaken to decrease body water and gut contents reducing BM. When taken to the extreme, severe weight-making practices can be hazardous, and efforts have been made to reduce their prevalence. Indeed, some have called for the abolition of these practices altogether. In lieu of adequate strategies to achieve this, and the pragmatic recognition of the likely continuation of these practices as long as regulations allow, this review summarises guidelines for athletes and coaches for manipulating BM and optimising post weigh-in recovery, to achieve better health and performance outcomes across the different Olympic combat sports.

Ribas, M. R., Netto, Z. C. O., Salgueirosa, F., Fernandes, P., de Matos, O., & Bassan, J. C. (2017). Association of actn3 r577x and ace i/d polymorphisms in brazilians wrestlers. *Revista Brasileira De Medicina Do Esporte*, 23(6), 469-472. doi:10.1590/1517-869220172306171864
Introduction: By associating genetics and sport, it is possible to identify subjects with greater capacity to adapt to training, and lower chances of injury. Objective: The investigation evaluated the genotypic and allelic distribution of ACTN3 R577X and ACE

I/D polymorphisms in Brazilian high-performance athletes in wrestling and percussion combat sports. Methods: The study included 37 male athletes ranked from first to third place in world scenarios, divided into two groups: wrestling (23 wrestlers, being 11 of Judo, 4 of Greco-Roman style, 8 of Brazilian Jiu Jitsu, with mean age of 27.3 +/- 6.9 years) and percussion combat sports (14 athletes with a mean age of 25.7 +/- 4.4 years, being 6 of Karate, 3 of Muay Thai, 4 of Taekwondo, 1 Boxing). Genotyping of ACTN3 and ACE I/D polymorphisms was performed by polymerase chain reaction (PCR) from the genomic DNA. Genotypic and allelic distributions were compared with control populations and athletes by Chi-square test and Fisher's exact test; all analyzes considered $p \leq 0.05$. Results: The genotypic distributions and allelic frequencies of ACTN3 RR=46%, RX=38% and XX=16%; R=65% and X=35%, and ACE I/D DD=47.7%, ID=34.3% and II=20%; D=62.9% and I=37.1% did not differ from the control population; however, when compared with wrestling athletes a significant difference was observed. Conclusion: These results suggest an association of ACTN3 R577X and ACE I/D genes with Brazilian high-performance wrestling athletes.

Riyahi-Alam, S., Mansournia, M. A., Kabirizadeh, Y., Mansournia, N., Steyerberg, E., & Kordi, R. (2017). Development and Validation of a Skinfold Model for Estimation of Body Density for a Safe Weight Reduction in Young Iranian Wrestlers. *Sports Health: A Multidisciplinary Approach*, 9(6), 564-569.

Background: Adverse effects of excessive body mass reduction among wrestlers dictate minimum weight determination through body composition. Although skinfold equations are essential to estimate body composition in the field setting, they are mostly derived from Western societies and may lack generalizability to other populations. Purpose: Previously published skinfold equations lacked external validity in predicting body density of Iranian wrestlers. We aimed to derive a new anthropometric model specific to young Iranian male wrestlers. Study design: Cross-sectional cohort study. Level of evidence: Level 3. Methods: One hundred twenty-six Iranian male wrestlers with at least 1 year of experience and a mean age of 19 ± 4.0 years underwent underwater weight analysis for body density estimation and anthropometric measurements. The previously published equations were validated, followed by new regression modeling, using multivariable fractional polynomials, with body density as the criterion predicted by common anthropometric variables. The final model was validated throughout the modeling procedure using 1000 bootstrap replications. Results: The mean body fat percentage (%BF) was 12.6% (95% CI, 11.9%-13.4%), lower than that of previous studies. Six previously published equations each had significant deviations from the line of identity (all $P < 0.001$). The new prediction equation combined subscapular, tricipital, and midaxillary skinfolds and body mass index cubed to predict body density. Conclusion: The development of ethnicity-specific equations, using statistically unbiased and comprehensive validation methods, is imperative for body composition estimation to determine the minimum weight for regulation of health in athletes. Clinical Relevance: Using equations without external validation can bias the prediction of minimum weight, leading to unsafe weight reduction by athletes. Compared with a previous study, much lower mean %BF was found using an ethnicity-specific equation (12.6% vs 15.9%). This difference observed in %BF prediction could affect safe fat reduction in athletes.

Roklicer, R., Vujkov, S., Stajer, V., Stojanovic, M., Drid, P. (2017). *Thermal responses in Greco-Roman wrestlers during training sessions*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

PURPOSE: The purpose of this research was to define how the thermal regulatory system reacts when induced by wrestling drill bouts during a practice in Greco-Roman wrestlers. In other words, the aim was to find out how the core temperature changes throughout a training session. METHODS: Five senior male wrestlers participated in this study ($n=5$), and they were 20.5 ± 4.1 years old; weighed 75.26 ± 23.44 kg, with the mean height of 173.4 ± 9.5 cm and 7.2 ± 5.4 years of experience in training and competing. Each subject competes in a different weight category. The participants underwent three rounds of wrestling drill along with wrestling throws in forced intensity manner. Each round lasted 5 minutes with 10 minutes rest period between each of them. Core temperature of the wrestlers was measured six times: baseline core temperature - before the warm-up, Core temperature after the warm-up, core temperature after the first bout, core temperature after the second bout, core temperature after the third bout and 10 minutes after the final bout. Besides the core temperature, heart rate and lactate levels were observed. Lactate levels were measured before the warm up, and after the 3rd, 6th and 9th minute after each wrestling bout during a rest period. Heart rate was measured right after the warm up and after each of the wrestling bouts. RESULTS: No significant differences were found in thermal responses after the three wrestling bouts, so the core temperature in wrestlers remained pretty much constant after the warm up. The only difference appears between the baseline core temperature value and the value after the warm up, 36.66°C and 38.7°C , respectively. This is expected due to increased blood flow through muscles and enhanced metabolic reactions (caused by the warm up). Even though the differences were not significant, it can be noticed that the temperature after the 1st bout was above 39°C in every participant so they reacted quite similarly throughout the entire session. CONCLUSION: The core temperature didn't change significantly throughout a training session in male wrestlers. From the previous results it can be concluded that the greatest temperature change appears right after the warm up is done. Although significant changes were observed in heart rate and lactate levels, it turns out that doesn't affect much the core temperature of wrestlers, which remained relatively high during a training session. Finally, we may say that activities during a training session are highly stressful but the length of bouts and rest periods are long enough to keep the thermal regulatory system working properly and unharmed for wrestlers.

- Ruiz Sanchis, L., Martin Ruiz, J., Tamarit Grancha, I., Menescardi Rayuelo, C., & Carlos Dos Santos, S. L. (2017). Introduction of the olympic wrestling in physical education through e-learning teachers. *Sportis-Scientific Technical Journal of School Sport Physical Education and Psychomotricity*, 3(2), 340-357. doi:10.17979/sportis.2017.3.2.1808
- Distance learning for teachers in Olympic combat sports (judo, wrestling, fencing, taekwondo and boxing) "Escuelaolimpica.com" is a e-learning project for Physical Education (PE) teachers of Aracati and Fortaleza (Ceara). The material designed by the group of methodology and didactics of physical education at the Faculty of Sciences of Physical Activity and Sport of the Catholic University of Valencia, is aimed at teachers of "Ensino Fundamental" and "Medio" in the area of PE, adapted to Brazilian Education Law and translated into Portuguese, it physical education teachers. The distance learning has been developed with the participation of five teachers from 6th to 9th of "Ensino Fundamental" and 1st to 3rd of "Ensino Medio", who were given a questionnaire of opinion on the contents of the Olympic Wrestling, before and after formation. In order to identify the degree of development of the dimensions of knowledge, know-how and being. After the intervention, teachers have improved in relation to the three dimensions. Being the learning of the dimension of the being, related to values and attitudes, the one that more punctuates the teachers that more time remain in the training web. in relating to the teaching of the PE, and incorporation of TIC resources in the teaching-learning contents.
- Sagayama, H., Kondo, E., Shiose, K., Yamada, Y., Motonaga, K., Ouchi, S., . . . Tanaka, H. (2017). Energy Requirement Assessment and Water Turnover in Japanese College Wrestlers Using the Doubly Labeled Water Method. *Journal of Nutritional Science and Vitaminology*, 63(2), 141-147. doi:10.3177/jnsv.63.141
- Summary:* Estimated energy requirements (EERs) are important for sports based on body weight classifications to aid in weight management. The basis for establishing EERs varies and includes self-reported energy intake (EI), predicted energy expenditure, and measured daily energy expenditure. Currently, however, no studies have been performed with male wrestlers using the highly accurate and precise doubly labeled water (DLW) method to estimate energy and fluid requirement. The primary aim of this study was to compare total energy expenditure (TEE), self-reported EI, and the difference in collegiate wrestlers during a normal training period using the DLW method. The secondary aims were to measure the water turnover and the physical activity level (PAL) of the athletes, and to examine the accuracy of two currently used equations to predict EER. Ten healthy males (age, 20.460.5 y) belonging to the East-Japan college league participated in this study. TEE was measured using the DLW method, and EI was assessed with self-reported dietary records for ~1 wk. There was a significant difference between TEE (17.962.5 MJ-d⁻¹ [4,2836590 kcal-d⁻¹]) and self-reported EI (14.463.3 MJ-d⁻¹ [3,4466799 kcal-d⁻¹]), a difference of 19%. The water turnover was 4.6160.73 L-d⁻¹. The measured PAL (2.660.3) was higher than two predicted values during the training season and thus the two EER prediction equations produced underestimated values relative to DLW. We found that previous EERs were underestimating requirements in collegiate wrestlers and that those estimates should be revised.
- Saponara, S. (2017). Wearable Biometric Performance Measurement System for Combat Sports. *IEEE Transactions on Instrumentation & Measurement*, 66(10), 2545-2555. doi:10.1109/TIM.2017.2677679
- This paper presents the design of a wearable system for measurements of athlete's performance in combat sports. The system provides objective measurements of athletes' shots, posture, and movements, and of the effectiveness of their training. The proposed instrumentation is useful to overcome the limits of traditional training methods, which are characterized by a subjective evaluation of the training effectiveness by a coach. The measuring system consists of a distributed network of three battery-powered wireless-sensing node types, worn by the athletes, and one master node, which is in charge of signal acquisition and processing tasks. The master node elaborates training statistics and visualizes them, either in real time during a combat session, or off-line for posttraining analysis. The wearable measuring system has been tested through real combat training sessions of athletes with different weights, ages, and experiences, both male and female. Different from the state-of-art athletes' biometric measurement machines, which are cumbersome and expensive, the proposed system is designed to ensure a low-cost and wearable implementation and to give easy-to-understand feedbacks during training, particularly to nonprofessional athletes.
- Sari, I., & Bayazit, B. (2017). The Relationship Between Perceived Coaching Behaviours, Motivation and Self-Efficacy in Wrestlers. *Journal of Human Kinetics*, 57(1), 239-251. doi:10.1515/hukin-2017-0065
- The current study aimed to determine the relationship between perceived coaching behaviours, motivation, self-efficacy and general self-efficacy of wrestlers who competed in the Super National Wrestling League. The sample consisted of 289 wrestlers. The Self-Efficacy Scale was used to measure self-efficacy perception, the Sports Motivation Scale to measure the motivation of the athletes, the Leadership Scale for Sport to determine perceived leadership behaviours, and the General Self-Efficacy Scale to determine the general self-efficacy perceptions of the athletes. For data analyses, SPSS 17.0 software was used. According to the results of the regression analyses performed with the enter method, it was found that perceived training and instruction behaviour along with perceived social support behaviour significantly explained self-efficacy (adjusted R² = .03), intrinsic motivation (adjusted R² = .04) and amotivation (adjusted R² = .05). Also, perceived training and instruction behaviour (beta = .51), autocratic behaviour (beta = -.17) and social support behaviour (beta = -.27) significantly contributed to athletes' general self-efficacy (adjusted R² = .10). In light of these findings, it may be argued that perceived training and instruction behaviour may be beneficial for self-efficacy, general self-efficacy, intrinsic motivation, and amotivation. On the other hand, it

could be stated that perceived autocratic behaviour may be detrimental for general self-efficacy of the athletes. As for social support behaviour, it may be suggested that it is negatively related to self-efficacy, general self-efficacy and intrinsic motivation. Lastly, a positive relationship was observed between perceived social support behaviour and amotivation in wrestlers. The results reveal the specific characteristics of wrestlers and suggest some implications for wrestling coaches.

Sashenkov, S. L., Gurilo, O. V., Melnikov, I. Y., Kolupayev, A. V., & Komarova, I. A. (2017). Features of the immune status of athletes of acyclic sports (fighters and boxers) depending on their sports qualification. [особенности иммунного статуса спортсменов ациклических видов спорта (борцов и боксеров) в зависимости от их спортивной квалификации]. *Russian Journal of Immunology*, 11(2), 217-220.

The study of blood cell counts and analysis of their changes in wrestlers and boxers made it possible to reveal special features of the population and subpopulation spectrum of lymphocytes in wrestlers and boxers of different qualifications. The sportsmen of power sports with anaerobic metabolism (wrestlers and boxers a significant decrease in the general population of T-lymphocytes) occurred due to a decrease in circulation of main subpopulations of T cells: T-helper and T-cytotoxic. There were also a decrease in number of cells with adhesion receptors (CD11b), the number of B-lymphocytes and cells bearing apoptosis readiness markers (CD95), opposite to elevated cell count with lymphocytes early positive activation (CD25) markers. An increase in cell number with receptors for interleukin-2 (CD25) with parallel decrease in the number of hematopoietic cell precursors and the main subpopulations of lymphocytes (T, B lymphocytes) is considered to be a reflection of the negative impact of intense speed-strength anaerobic regimen on immune system, and possible may be resulted in immunodeficiency in these athletes. The immune status of athletes going in for acyclic sports is characterized by marked cytopenia of relative and absolute numbers of T-lymphocytes, both T-helper and T-cytotoxic lymphocytes, and also CD16 and CD56 positive cells, belonging to congenital immunity factors, and also B lymphocytes (CD20), compared to sportmen groups of skiers and swimmers, and that reflects a decrease in intensity of immunopoiesis in anaerobic type of energy metabolism, and considered to be a significant factor, affecting immune system quality reaction and T- and B-cell cooperation reaction.

Исследование показателей крови и анализ их изменений у борцов и боксеров позволил выявить особенности популяционного и субпопуляционного спектра лимфоцитов у борцов и боксеров различной квалификации. У спортсменов силовых видов спорта с анаэробной направленностью обмена (борцов и боксеров) установлено достоверное снижение общей популяции Т-лимфоцитов, за счет уменьшения в циркуляции основных субпопуляций Т-клеток: Т-хелперов и Т-цитотоксических. Также зафиксировано снижение количества клеток, несущих рецепторы адгезии (CD11b), числа В-лимфоцитов и клеток несущих маркеры готовности к апоптозу CD95), на фоне роста клеток с маркерами ранней позитивной активации лимфоцитов (CD25). Повышение количества клеток с рецепторами к интерлейкину-2 (CD25) с параллельным снижением количества предшественников гемопоэтических клеток и основных субпопуляций лимфоцитов (Т, В-лимфоцитов) является отражением негативного воздействия на иммунную систему интенсивного скоростносилового анаэробного режима и может проявляться развитием иммунодефицитных состояний у данной категории спортсменов. Иммунный статус спортсменов, занимающихся ациклическими видами спорта характеризуется ярко выраженными цитопеническими реакциями со стороны относительного и абсолютного количества Т-лимфоцитов, как Т-хелперов, так и Т-цитотоксических лимфоцитов, уровней CD16 и CD56 позитивных клеток, относящихся к факторам врожденного иммунитета, В-лимфоцитов (CD20), в сравнении с группами лыжников и пловцов, что отражает снижение интенсивности иммуно-поэза при анаэробном типе энергообеспечения и является фактором, значимо влияющим на качество иммунного ответа и механизмы Т и В-клеточной кооперации.

Sashenkov, S. L., Zhurilo, O. V., Melnikov, I. Y., Kolupaev, V. A., & Komarova, I. A. (2017). Specificity of peripheral blood parameters depending on the level of sports qualification of sportsmen. [ОСОБЕННОСТИ показателей периферической КРОВИ В ЗАВИСИМОСТИ ОТ УРОВНЯ СПОРТИВНОЙ КВАЛИФИКАЦИИ СПОРТСМЕНОВ]. *Russian Journal of Immunology*, 11(3), 496-498.

The investigation is aimed to problems of dynamic changes associated with a progress in sports qualification of sports professionals, and changes in peripheral red blood cell-associated parameters, probability corresponding to positive or negative signs of blood system adaptation to aerobic or anaerobic physical activity conditions. The optimal level of red blood cell-associated parameters, that meets the elevated oxygen tissue consumption demands, was observed in groups of Masters of sports and candidates for Master of sports. In groups of wrestlers and boxers some variations in red blood cell-associated parameters were also observed, with mostly lack of statistically significant differences between sports, sport qualification, or other parameters investigated, indicating no or little impact of sports specificity factors on red blood cell-associated parameters. The values of "leucocytes blood formula entropy" in groups of skiers, swimmers and wrestlers were within normal range, thus indicating a relatively adequate state of adaptation of blood system and it's regulation in response to increased physical activity, but in boxers group they were out of normal range, probably due to negative side effect of adaptation processes or even a pre-morbid (pre-disease) state. The values of "integral coefficient of blood deterioration" also indicated on worse changes, being statistically significant in group of boxers only, thus reflecting deviations of functional activity, probably due to negative adaptive reaction accumulation as a result of specific factors in this sport. Conclusions: Progress in sports qualification mostly of aerobic (cross-country skiers, swimmers) or anaerobic (wrestlers, boxers) physical activity, was

accompanied with changes in red blood cell-associated parameters, thus with sufficient probability corresponding to specific effects of aerobic or anaerobic physical activity on sportsmen.

Оптимальный с точки зрения обеспечения кислородного запроса тканей уровень периферического отдела эритрона достигался в группах мастеров спорта и кандидатов в мастера лыжников и пловцов. В группах борцов и боксеров выявлена вариабельность показателей "красной крови" при отсутствии достоверных различий показателей от спортивной квалификации, что указывает на незначительное влияние специфических для данных видов спорта нагрузок на показатели периферического отдела эритрона. Значения показателя энтропии лейкоцитарной формулы крови у лыжников, пловцов и борцов укладывались в диапазон нормы (от 56 % до 67 %), указывая на хорошую адаптацию системы крови к физическим нагрузкам, однако, в группе боксеров достигая неблагоприятного диапазона от 67 % до 75 %, предполагая развитие обратимых реакций адаптации либо преднозоло-гического состояния. Неблагоприятные изменения выявлял также интегральный коэффициент ухудшения крови, достигая достоверного снижения только в группе боксеров, свидетельствуя об отклонениях в функциональном состоянии организма, накоплении нежелательных факторов в процессе тренировочно-соревновательной деятельности боксера. Выводы: По мере роста спортивной квалификации наблюдаются изменения показателей периферического отдела эритрона, которые в значительной степени зависят от аэробной или анаэробной направленности тренировочного процесса.

Sawczyn, S., Lusenko, O. N., Mishchenko, V. S., Pasek, M., & Dornowski, M. (2017). The limits of anaerobic glycolytic capacities of skilled wrestlers on the basis of anaerobic testing loads of different duration and character. *Archives of Budo*, 13, 63-70.

Background & study Aim: It is known that a fatigue response underlies the efficient of elite wrestlers' specific work capacities. Differences in fatigue and characteristics of special work capacity may relate to differ in capacities of anaerobic lactate systems. The objective of the study was the maximal individual level of anaerobic glycolytic capacities of skilled wrestlers based on the results of three variants of a specific laboratory test. Material & Methods: Thirty-four free-style wrestlers of national and international level of middle weight category, aged 19-28 years with body mass from 76.9 (64-89) kg having engaged in sports training for 5-13 years participated in studies. All subjects performed three variants of maximal ergometric anaerobic lactate tests: 30s, 60s, 120s and test 4, 30s each (recovery interval 30s) on cycle ergometer. They have been performed within days after the recovery micro cycle in the control training sessions. Anaerobic tests were performed the day after the previous test. Work output was measured. Lactic acid concentrations in capillary blood were determined on the 3rd minute after tests. We measured VO_2 max also for estimation of the part of aerobic energy in different anaerobic lactate tests. The graded (2 min) load power increment on cycle ergometer to failure (12-16 min) was applied. Oxycon Pro (Jaeger) was utilized in breath by breath mode. Lactic acid concentrations in capillary blood were determined on the 3rd minute after the tests (LP-420, Dr. Lange). Percentile zones for determining the levels of test indices were distinguished, which could be the initial standard for differentiation of high and very high capacities of some athletes or groups of wrestlers of middleweight category. Results: During longer anaerobic tests (60s and test 4, 30s each) higher blood lactate concentrations were observed as compared to 30-s Wingate test, even despite less total work (on a per 30s basis). The lowest aerobic component of work energy supply in long-term anaerobic tests was noted during 60-s load. The lowest individual variations occurred during 120-s continuous load. The aerobic energy supply at the end of test 4, 30-s each was realized to a greater extent as compared to other anaerobic tests. Conclusion: Determination of individual prerequisites to realization of wrestlers' anaerobic glycolytic capacities necessitates 2-3 testing with anaerobic type loads of different duration. Practical significance of the study may consist in the advance of additional criteria for regimes of training load with reason for individual predisposition of wrestlers.

Sazonov, V. V. (2017). Peculiar aspects of qualified wrestlers' special workability and supreme nervous system functioning at special training stage of preparatory period. *Pedagogics Psychology Medical-Biological Problems of Physical Training and Sports*, 21(1), 46-50. doi:10.15561/18189172.2017.0108

Purpose: to determine peculiar aspects of qualified wrestlers' special workability and supreme nervous system functioning in special training stage of preparatory period. Material: 18 qualified wrestlers if 17-20 yrs age were tested. We used testing of special workability and psychophysiological testing. Results: it was found that sportsmen's special workability was at rather high level. Though, recreation coefficient witnesses about some accumulation of fatigue. Besides, we registered reduction of central nervous system's functional potentials. It is proved by latent periods of simple and complex visual reactions (at low and below average levels). We found correlations between sportsmen's special endurance, level of complex visual-motor reaction and nervous processes' functional mobility. Besides, sportsmen with stronger nervous processes recreate quicker after standard loads. Conclusions: it was found that alongside with high special workability sportsmen accumulate fatigue and have absence of recreation. It is proved by weakening of central nervous system's functional potentials. We supplemented the data about correlation between special workability and sportsmen's psycho-physiological condition. It was assumed that persistent influence on supreme nervous system will permit to sustain special workability at high level and prevent from over-training.

Seifert, T. (2017). Neurologic Health in Combat Sports. *Neurologic Clinics*, 35(3), 523-+. doi:10.1016/j.ncl.2017.04.001

Neurologic injuries of both an acute and chronic nature have been reported in the literature for various combat sport styles; however, reports of the incidence and prevalence of these injury types vary greatly. Combat sports clinicians must continue to strive for the development, implementation, and enforcement of uniform minimum requirements for brain safety. These health

care providers must also seize on the honor to provide this oft-underserved population with the health care advocacy they very much deserve, but often do not receive.

Sever, O., Gönülates, S., Bayrakdar, A., Demirhan, B., Geri, S., & Zorba, E. (2017). Anaerobic Capacity Changes of the National Freestyle Wrestlers during the Olympic Qualification Competition Period. *Journal of Education and Training Studies*, 5(8), 26-29. This study aimed to evaluate the national level wrestlers' anaerobic capacity through the preparation and qualification periods for Rio 2016 summer Olympic Games. For this manner, 10 national level freestyle wrestlers' (age $22,10 \pm 3,21$; weight $64,75 \pm 6,34$; height $164,31 \pm 4,75$) anaerobic outputs measured 3 times in three month intervals with Bosco repeated jump test. Peak Jump(cm), Flight time, average power, average power/weight, first 15 sec average jump height, last 15 sec average jump height, fatigue index scores analyzed with repeated measures Anova. Mean power/weight output of the wrestlers increased from 20,42 W/kg to 21,28 W/kg (4,21%) and fatigue index is decreased from 1,185 to 1,142 (3,62 %). However, this increase was not statistically significant ($p < 0,05$). In six months of qualification and preparation period wrestlers' anaerobic capacity did not change and it is thought to have been caused by some reasons such as having already reached a certain anaerobic peak level or athletes' competition level and frequency which might made it difficult for them to have a proper periodization during the year.

Shiose, K. K., E.; Sagayama, H.; Yamada, Y.; Osawa, T.; Motonaga, K.; Ohuchi, S.; Kamei, A.; Nakajima, K.; Higaki, Y.; Tanaka, H.; Takahashi, H. (2017). Body water assessment using bioimpedance spectroscopy during rapid weight loss and recovery in Japanese wrestlers *International Journal of Sport Nutrition and Exercise Metabolism*, 27(S1), S9. Athletes in weight-category sports conduct rapid weight loss (RWL) followed by weight regain (WR) before competition. Body water assessment during RWL and WR is important for monitoring changes in body composition and for predicting excessive dehydration. Bioimpedance spectroscopy (BIS) is an easy tool for assessing body water status. In contrast to the single-frequency impedance technique, BIS can assess extra- and intra-cellular water (ECW and ICW) content, and total body water (TBW) content separately. However, assessment of body water change, using BIS during RWL and WR, has not been well validated. This study aimed to determine the validity of BIS method, as compared to the stable isotope dilution technique, for measuring changes in TBW in Japanese wrestlers. Ten male Japanese collegiate wrestlers were asked to conduct RWL (i.e., loss of 6% of body mass in 53 hours) by a self-selected method, followed by WR in 13 hours, with a prescribed diet (energy 2886 ± 310 kcal, protein 64 ± 9 g, fat 60 ± 10 g, and carbohydrate 522 ± 47 g). Body composition using an air plethysmography displacement system, TBW using a stable isotope dilution technique (TBWDLW), and ECW and ICW using BIS were determined at baseline, post-RWL, and post-WR. TBW assessed by BIS (TBWBIS) was calculated as the sum of ECW and ICW. Body mass, fat mass, and fat-free mass decreased post-RWL (73.68 ± 7.99 to 68.96 ± 7.65 kg, 8.7 ± 2.2 to 7.2 ± 2.1 kg, and 65.0 ± 7.0 to 61.8 ± 6.3 kg, respectively; $P < 0.05$). Body mass and fat-free mass recovered post-WR (71.84 ± 7.71 and 64.31 ± 6.42 kg, respectively; $P < 0.05$ compared with post-RWL). The ECW/ICW ratio assessed by BIS decreased post-RWL (0.68 ± 0.03 to 0.65 ± 0.03 , $P < 0.05$), and recovered post-WR (0.69 ± 0.03 $P < 0.05$ compared with post-RWL). Both TBWDLW and TBWBIS decreased post-RWL (46.4 ± 5.2 to 43.2 ± 4.8 L and 48.6 ± 6.9 to 45.3 ± 6.0 L, respectively; $P < 0.05$) and recovered post-WR (46.5 ± 4.9 L and 47.5 ± 6.6 L, $P < 0.05$ compared with post-RWL). The change in TBWBIS from baseline to post-RWL was similar to that in TBWDLW (-3.3 ± 0.3 and -3.2 ± 0.2 L, $P = 0.720$), but the change in TBWBIS from postRWL to post-WR was smaller than was observed for TBWDLW (2.1 ± 0.3 and 3.2 ± 0.2 L, $P < 0.05$). In conclusion, BIS provides accurate assessment of dehydration status during RWL, but underestimates the rehydration status during WR.

Simenko, J., Ipavec, M., Vodigar, J., & Rauter, S. (2017). Body symmetry/asymmetry in youth judokas in the under 73 kg category. / Symetria i asymetria ciała judoków w kategorii juniorów do 73 kg. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(2), 51-55.

Background. The anthropometric status of judokas is most frequently measured in samples containing judokas in all weight categories. It is therefore essential to undertake research into specific weight categories. Problem and aim. This study seeks to examine the status of body symmetry in youth judokas in the under 73 kg category. Methods. A group of Slovenian youth judokas ($n=10$, age: 17.28 ± 1.46 years; height: 177.53 ± 3.71 cm; weight: 73.86 ± 3.01 kg) were recruited for this study. 3D anthropometric measurement of the judokas' bodies was performed by the NX-16 ([TC]2, 3D body scanner Cary, North Carolina). Using software, we extracted values for 15 paired variables. To determine the differences in symmetries we used a paired T-Test with statistical significance set at $p \leq 0.05$. Results. In five variables we found statistically significant differences between right and left body pairs. Those were elbow girth $t(9)=4.08$, $p = 0.003$, forearm girth $t(9)=2.84$, $p = 0.019$, thigh girth $t(9)=3.87$, $p = 0.004$, mid-thigh girth $t(9)=5.81$, $p = 0.000$ and calf girth $t(9)=2.45$, $p = 0.037$. Conclusions. It is of great importance for right hand-stance dominant judokas to train their nage waza - throwing techniques - bilaterally to achieve increased technical-tactical solutions in a judo bout and also to develop their morphological characteristics in a symmetrical direction. Those factors will help reduce the dropout rate and will contribute to the systematic and healthy development of youth athletes into competitive senior judokas.

Slacanac, K., Baic, M., Starcevic, N. (2017). *Proposal for a new regulation of unofficial weight categories in the age group of schoolboys*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

INTRODUCTION: Wrestling weight categories are created to ensure approximately equal condition for competitors in wrestling bouts during competitions. This study presents a review of the distribution of participants into weight categories among schoolboy wrestlers during last six years at the Croatian national Greco-Roman wrestling championships. PURPOSE: The main goal of this research was to propose new unofficial weight categories of schoolboy wrestlers who participate in the national championships. METHODS: The number of wrestlers in each weight category was analysed during the Croatian national Greco-Roman wrestling championship in the last six years. Descriptive parameters were calculated and Chi-square test was conducted at the statistical significance level of $p < .05$. RESULTS: A smaller number of wrestlers was revealed in lower categories, while the number of wrestlers in middle and higher categories was bigger. The analysed results showed significant frequency deviation from the expected number of wrestlers in each weight category of the age groups of schoolboys. Significant deviation was found in seven out of eleven weight categories. A smaller number of wrestlers in lower weight categories and a higher number of wrestlers in the official middle and heavy weight categories is probably due to the increased number of children with higher body weight in Croatia. Reason for the decreasing number of wrestlers every year can be withdrawal from wrestling in the first five years of training. Withdrawal from wrestling can be caused by unreal expectations, insufficient motivation, excessive participation in wrestling tournaments, body mass reduction for competitions and by a small number of weight categories at championships. CONCLUSION: Correction of weight categories is important to prevent withdrawal from wrestling, to increase motivation and decrease occurrence of body mass reduction in young wrestlers. Therefore, we propose to retain the existing weight classes, according to UWW, and to introduce four new weight categories (50 kg, 53 kg, 62 kg and 100 kg) as the unofficial weight categories at national, regional and municipal competitions for the age group of schoolboys.

Slacanac, K., Baic, M., & Starcevic, N. (2017). Competition Efficiency Analysis of Croatian Junior Wrestlers in European Championship. *Sport Mont*, 15(2), 43-47.

Croatian junior wrestler won a bronze medal at the European Championship 2016 year. Considering the potential of our wrestlers there is an obvious need of technical and tactical analysis so our juniors and seniors U23 wrestlers would be able to achieve even better results. Match analysis were conducted by LongoMatch 0.20.1. Seven matches of Croatian wrestlers were analysed. Time parameters, score efficiency, technical efficiency and tactical structure were observed and analysed from the aspect of attack and defence phase and successful/unsuccessful techniques. This paper shows descriptive parameters and competitor efficiency were calculated. The results show a great number of positive score in a standing position in relation to parterre position. The parameters of competitive efficiency (0.49 points per minute) show better attacking efficiency (1.32 points per minute) in relation to defence efficiency (0.83 points per minute). Croatian wrestlers achieve less score per minute in relation with elite wrestlers, but it is visible a significant progress in technical and tactical efficiency in relation to the past three years. According to place realization of technique, Croatian wrestlers realized more technique in the center, while opponents realized technique in the zone and moving to the zone. Further analysis of efficiency and individualisation training will improve efficiency of Croatian national wrestlers.

Slimani, M., Chaabene, H., Davis, P., Franchini, E., Cheour, F., & Chamari, K. (2017). Performance aspects and physiological responses in male amateur boxing competitions: a brief review. *Journal of Strength & Conditioning Research*, 31(4), 1132-1141.

Boxing is one of the most popular striking combat sports in the world. The aim of this review was to present data concerning performance analysis (time-motion and technical-tactical analysis) and physiological responses (i.e., blood lactate concentration [BLC], heart rate, and oxygen consumption) during novice and elite male simulated and official amateur boxing competitions in any age category. The present review shows that boxing competition is a high-intensity intermittent striking combat sport. Typically, the activity-to-rest ratio was higher in elite (18:1) than in novice (9:1) boxers and significant differences were observed between rounds (first round = 16:1, second round = 8:1, and third round = 6:1) in novice boxers. Thus, total stop-time and total stop-frequency increased over subsequent rounds in novice boxers. The technical-tactical aspects in elite and novice boxing bouts were different between rounds and dependent on the match outcome (i.e., winners vs. losers). Particularly, the current review highlights that triple-punch combinations, total combinations, block- and counter-punch combinations, total punches to the head, technical performance effectiveness, and defensive- and offensive-skills effectiveness may have contributed to win in novice and elite boxing competitions. Higher frequencies of technical movements were also observed in elite compared with novice boxers. From a physiological point of view, BLC increased significantly from postround 1 compared with postround 3 in novice boxing match. BLC was also higher in official than in simulated elite boxing matches in senior compared with junior boxers and in medium heavy-weight category compared with light- and medium-weight categories in junior boxing competition. A higher percentage of maximal heart rate (%HRmax) and maximal oxygen uptake ($\dot{V}O_{2max}$) were reported in round 3 compared with rounds 2 and 1 in elite boxing competition. In conclusion, these data are useful for both technical-tactical and physical conditioning sessions. Coaches and fitness trainers are encouraged to adjust their training according to these particular characteristics, specifically in terms of age, participants' level, weight categories, and combat contest type.

Slimani, M., Chaabene, H., Miarka, B., Franchini, E., Chamari, K., & Cheour, F. (2017). Kickboxing review: anthropometric, psychophysiological and activity profiles and injury epidemiology. *Biology of Sport*, 34(2), 185-196.

Kickboxing is one of the modern combat sports. The psychophysiological demands of a kickboxing competition require athletes to achieve high thresholds of several aspects of physical fitness. The aim of the current review is to critically analyse and appraise the kickboxer's anthropometric, physiological, physical and psychological attributes with the activity profile and injury epidemiology in order to provide practical recommendations for training as well as new areas of scientific research. The available information shows that both amateur and elite-level male kickboxers are characterized by a higher proportion of mesomorphy with a well-developed muscle mass and low body fat percentage. While there is some variation in the maximum oxygen uptake of kickboxers, moderate to high cardio-respiratory levels are reported for these athletes. Regardless of kickboxers' level, a high peak and mean anaerobic power output were reported. High-level kickboxing performance also requires well-developed muscle power in both the upper and lower limbs. Psychological factors contribute to success that requires high levels of self-confidence, motivation, dispositional hope and optimism, mental toughness/resiliency, and adaptive perfectionism. Psychological attributes also distinguished successful from less successful kickboxers. The activity-to-rest ratio was higher in elite (1:1) than both amateur and national-level (from 1:2 to 1:5) kickboxers, with no significant differences between rounds (round 1 = 1:4, and rounds 2 and 3 = 1:5) as well as between winners and losers in amateur and national-level simulated combats. These particular psychophysiological characteristics and performance aspects of kickboxers influence performance and could serve as guidance for training. Finally, kickboxing is characterized by chronic repetitive head trauma, which causes hypopituitarism due to traumatic brain injury (TBI). Future investigations into the physical, physiological and psychological characteristics related to age, gender and competitive levels of kickboxers are required to enrich the current knowledge and to help create the most suitable training programme.

Slimani, M., Davis, P., Franchini, E., & Moalla, W. (2017). Rating of perceived exertion for quantification of training and combat loads during combat sport-specific activities: a short review. *Journal of Strength & Conditioning Research*, 31(10), 2889-2902.

The aim of this short review was to summarize data pertaining to the rating of perceived exertion (RPE) methods (RPE value and session-RPE) during combat sport-specific activities (i.e., competition and training) based on many factors, including contest type (i.e., official vs. simulated vs. training), combat rounds, age of participants and muscle groups, and their correlation with physiological variables (i.e., blood lactate concentration [La] and heart rate [HR]). The current review shows higher RPE in a match of mixed martial arts (MMAs) than Brazilian jiu-jitsu and kickboxing matches and during the competitive period compared with the precompetitive period. This could be explained by the longer duration of bouts, the higher percentage contribution of aerobic metabolism in MMA than other combat sports and contest type differences (simulated vs. official matches). Thus, this review found significant correlations between RPE or session-RPE, [La] and HR. Particularly, there was a stronger correlation between RPE and [La] during official striking ($r = 0.81$) than grappling combat sports matches ($r = 0.53$). In addition, a variation of correlation (moderate to large) between session-RPE and HR-based methods has been reported (i.e., Edwards' training load [r ranged between 0.58 and 0.95] and Banister training impulse [r ranged between 0.52 and 0.86]). Specifically, stronger correlation was apparent in combat sport competition that required a much higher percentage contribution of aerobic metabolism (e.g., karate) and in adult athletes than anaerobic-based combat sports (e.g., taekwondo) and young athletes, respectively. Indeed, the current review highlights that the correlations between session-RPE and HR-based methods were higher during official competition than training sessions. Session-RPE was affected by participants' competitive level, the intensity of session (high vs. low), the training modalities (tactical-technical vs. technical- development vs. simulated competition), and the training volume in combat sports athletes. Rating of perceived exertion is a valid tool for quantifying internal training and combat loads during short- and long-term training and simulated and official competitions in novice and elite combat sport athletes. Furthermore, both RPE methods may be a more reliable measure of intensity or effort when both anaerobic and aerobic systems are appreciably activated. Coaches, sports scientists, and athletes can use session-RPE method to quantify short-term training and combat loads in adult athletes during precompetitive period much more than long-term training and in young athletes during the competitive period. They can also use RPE to monitor combat and short- and long-term training loads to better plan and assist training programs and competitions.

Souza Pereira, A. A., Queiroz, A., Carvalho, A., Nelli, C. M., Domingues Babiski, J. A., Katayama, M. M., & Alvarenga, M. L. (2017). Sweating rate in Judo athletes. *Rbne-Revista Brasileira De Nutricao Esportiva*, 11(61), 16-23.

Judo is a combat sport practiced as a martial art and establishes forms of development of personal defense techniques. Dehydration in this sport can be mild, moderate and severe and the sweat rate of an athlete necessarily depend on such variables as exercise intensity, body surface, room temperature, humidity and acclimatization. The aim of this study was to evaluate the sweat rate of judo athletes. It is a cross-sectional study conducted experimentally with 35 athletes, aged 9 to 34 years old, from the judo team of a club in Sao Paulo. It was identified that the average weight loss percentage was 0.8% for adults and 0.1% for teens. The average volume of fluid ingested during training of about 90 minutes was higher in adolescents (558 ml) than in adults (393 ml). The average adolescents sweat rate was 8.9 ml / min and adults was 11.4 ml / min. We conclude that weight loss during training and the sweat rate in judo athletes was higher in adults than in teenagers. The average water intake by adults was lower when compared to adolescents, and neither group consumed the recommended amount of water intake per hour. However, weight loss was within the acceptable in both groups.

Soygüden, A., Imamoglu, O. (2017). *12th World Universities Wrestling Championship Greco-Roman style - Competition technical analysis*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

PURPOSE: The purpose of this study was to make the 12th World Universities Wrestling Championships Greco-Roman style competition technical analysis. There were 250 participants from 26 countries participating in Corum / Turkey held on 25-30 October 2016. METHODS: The observation form prepared before the competitions with recorded by two researchers, technical analysis of the recordings were obtained. During the competitions, the scores obtained, warnings, winning types, successful techniques recorded in the technical analyze form. In statistical analysis, the percentage distributions for each parameter and match percentage rates were calculated. RESULT: The number of technical points taken for all weight groups in wrestling competitions was 341 points. The most number of techniques were 157 with light weight and the maximum numbers of competitions were 38 with light weight group. The highest number of techniques was achieved in lightweight groups with 157 and with the maximum number of matches was made with 38 in the light weight group. The least number of techniques was made with 63 techniques in the heavyweight groups and the least number of competitions was made with 18 matches in the heavy weight group was also seen. The highest number of victory was won by score in the heavyweight group (83%); the highest number of victory was won by technical pin in the lightweight group (21%). In the lightweight weight groups have not been winner by pin. The highest score was made with passive punishment point in lightweight group 28%, middleweight group 38% and heavyweight group 33%. The highest scores in the second row were obtained from the techniques of snap down spin behind with 16% at light weight, high dive takedown at 16.5% in middle weight, and move out of the mat and high dive takedown score at 22% in heavyweight groups. CONCLUSION: As a result; the most effective technique in Greco-Roman style given by the referee was passive punishment point in all weight groups. In this case, the wrestlers need to be more active in the bilateral struggle. In particular, it is suggested to fight tempo wrestling with their arms and chest by fighting against each other and struggle in the standing position.

Stajer, V., Trivic, T., Rocklicer, R., Madic, D., Ostojic, S., Drid, P. (2017). *Physical condition profile of Serbian Greco-Roman style wrestlers*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

NTRODUCTION: Main task of fitness and conditioning program is to improve athletic performance through general, basic and specific skills training programs needed for the successful performance of athletes in competition and in everyday training (Milanovic, Jukic, Šimek, 2003). In the Greco-Roman style of wrestling, wrestlers are allowed to use only hands and upper body for the implementation of techniques, yet strength of the lower extremities is of great importance to perform techniques. PURPOSE: The aim of this study was to determine whether there were some significant qualitative differences in the conditioning readiness as manifested in the area of functional abilities of wrestlers from the Serbian international and national level programs. METHODS: Sample consisted of 27 wrestlers who were divided in two groups (international group - 1; national group - 2) and were able to correctly do the tasks set in the tests, as well as participants were medal winners at the national, international competitions. International group (1) was a group of wrestlers from the Serbian Greco-Roman national team. National group (2) was a group of wrestlers from the Serbian wrestling clubs. Their functional capacity was examined with a graded exercise test protocol on a treadmill. Four variables were measured: relative maximum oxygen consumption VO_{2max} (ml/min/kg); relative oxygen consumption at the anaerobic threshold VO_{2AnT} (ml/min/kg); maximal heart rate HR_{max} ; heart rate at the anaerobic threshold HR_{AnT} . Data analyses were conducted using the SPSS.20 computer software. Univariate analysis of variance (ANOVA) was used for analyzing the differences between the groups. RESULTS: Results showed no statistically significant difference between the analyzed groups. CONCLUSIONS: By getting familiar with the basic diagnostics and conditioning readiness of athletes, wrestling and conditioning coaches will be able to plan and program workouts for their athletes in a better way.

Starosta, W. (2017). *Structure, conditions and development of opponent's feelings in opinion of high advanced wrestlers and athletes of selected combat sports*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.

The level of coordination abilities is of crucial importance in combat sports and martial arts. Its particular and very specific manifestation is the opponent's feelings which exerts a considerable impact on the effectiveness of the fight. Despite the considerable importance of the opponent's feelings this problem has been treated very marginally so far. The proof of the fact is the lack of very little number of publications [2, 19] and attempts to define the notion, to describe its structure and conditions of development. PURPOSE: of the work was: 1. Define the term of opponent's feeling" in combat sports and martial arts competitors. 2. Specify components (structure) of opponent's feelings. 3. Define the conditions of high level of opponent's feelings. 4. Attempt to establish the conditions affecting the opponent's feeling" and methods of its development. 5. Look for reserves as far as the development of movement coordination, and focus particularly on its complex manifestation such as opponents 'feeling", "mat feeling" etc. MATERIAL and METHOD. Studies were conducted on 154 advanced athletes: wrestlers in classical style (n =50) and female and male wrestlers in free style (n=11+59=70), 20 kyokushinkai karatekas and 14 wrestling coaches. A particularly high level of advancement was recorded for wrestlers, who included former Olympic champions and

medal winning athletes of the highest rank. Responses to 12 of them were then processed. The age of studied individuals was within 18-40 years, and the training period was 5-25 years. A questionnaire prepared by W. Starosta and containing 21 questions dealing with opponent's feeling" was research method. The questions concerned the opponent's feeling" among representatives of selected of combat sports and martial arts. CONCLUSIONS: 1. A complex manifestation of a high level of coordination abilities such as opponent's feeling" or "mat feeling" depend on a number of conditions: level of sport advancement, training experience, length of training period, part of training session, temperature of the surrounding, level of emotions etc. 2. The majority of the questioned observed in the themselves a higher level of opponent's feelings during the start training period, rather than during preparatory period. 3. According to the surveyed (45%), the highest level of the opponent's feeling" occurred in the main/ core part of the training session, and the lowest in its further part (31%). 4. The symptoms of the high level of opponent's feelings include: The correct predicting of the opponent's intentions; Proper psychic attitude; The certainty of the fight; The improper of opponent's feelings is the lack of these symptoms.

Starosta, W., Fostiak, D., Zurek, P. (2017). *Level of kinaesthetic differentiation of movement amplitude in polish national team wrestlers in various training stages*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

Directly physical contact with an opponent, linked with a speed and precise movements, executed in various technical-tactical combinations, calls for a high level of movement coordination in wrestlers. Kinaesthetic differentiation are the very important part of the movement coordination, because sensations influence the high precision of movements. Only kinaesthetic differentiation relevant to individual and favourable technique, can help to learn a master technique. Thus, it is important to keep on verifying these sensations by a competitor with the aid of a coach and other people involved in training. PURPOSE: The of this study was to investigate the relation between the precision of re-producing of the given bending angle of a limb and training stage, as well as to determine which limb is dominant. METHOD: The test for measuring the ability of kinaesthetic differentiation of a movement amplitude has been used. There were two sets for measuring: a kinaesthesiometer linked with a set of goniometers and computer. 107 wrestlers of Polish National Team were subject to this examination. That group consisted of classic style younger juniors (cadets), juniors and seniors, and free style younger juniors. Measuring was carried out once during the preparation period of training. CONCLUSIONS: 1. The precision of movement amplitude reproduction varied depending on training stage. The highest precision was recorded in seniors, and the lowest in classic style juniors. 2. Some statistically insignificant differentiation of the results for both upper limbs were observed. Left hand was more precise. 3. The highest symmetry of movements precision was observed in classic style younger juniors. 4. The results seem to confirm the versatile technical preparation of the wrestlers, i.e. symmetrical performing of exercises may result in better sport results in competition.

Starosta, W., Glaz, A. (2017). *Criteria of selection of candidates for wrestling*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling" Novi Sad, Serbia.

The selection of right candidates is crucial in every sport, including wrestling. Its correct solution ensures the development of the discipline itself and success for athletes. The increasing level of sport requires the participation of increasingly versatile wrestlers. Only such athletes can now be successful in the international arena. In some countries, natural selection was based on accepting all candidates and after some time rejecting those who did not achieve proper sports results. In most countries the selection was based on the checking of the candidates in respect to the various predispositions for wrestling. A number of different tests and trials were proposed for this purpose. It is not known which of these were scientifically verified and were used in a number of other countries. PURPOSE: of this study was: 1. An attempt to summarize the output collected in the criteria of selection of candidates for wrestling. 2. Presentation of the results of a pedagogical experiment aimed at determining the objectivity of tests in the selection of candidates for wrestling. 3. Presentation of own set of candidate selection tests for wrestling. RESULTS AND CONCLUSIONS: 1. The existence of a large number of proposals from various authors was found but none of them was checked for their reliability. 2. An annual pedagogical experiment was conducted on 121 persons, including 96 wrestlers and 25 children and using 13 anthropometric measurements and 7 fitness tests. Those wrestlers qualified for further training achieved higher scores in all tests used. Based on the results obtained, a set of fitness tests for the selection of candidates for wrestling was proposed. 3. Based on the 21-year long research conducted on wrestlers of the Polish National Team in the classic and free style, a set of 22 tests with high reliability ratios of the most important movement abilities necessary to achieve high sports results was developed. For the results of each test, a "T" scoring scale was developed to unify the results collected in different units and to evaluate the wrestler's performance level. 4. The proposed set includes tests to evaluate objectively the level of fitness required to be successful in all weight categories of wrestlers. Contemporary high requirements in this discipline regarding the coordination abilities required and their correct relationship to physical abilities were taken into account. 5. The table lists 7 sets of tests of performance for the evaluation of candidates for wrestling, including 3 own, which sum up the elaborations by for foreign and Polish authors. They allow the coach to select a set that is most suitable for specific club conditions.

Starosta, W., Markiewicz, G., Zurek, P. (2017). *Developing coordination abilities of wrestlers by means of three kinds of body submerging*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.

Achieving significant success in wrestling requires a high level of coordination abilities. In wrestling these abilities should be developed at the same time with strength abilities, because success on the mat depends on all these abilities. Reserves relating to the ways and means of developing coordination abilities become very quickly exhausted. Standard training conditions of wrestlers have been recently slightly changed, and water environment has been introduced. PURPOSE: of the investigations herewith was to: establish the effect of the special set of coordination complex exercises performed by wrestlers in natural and in water environment. METHODS: The experiment was carried out with 31 wrestling champions class, who were divided into two groups: the control group and experimental group. Training session of each of the groups comprised of set of exercises developing movement coordination. Wrestlers from the control group (n=16) performed a set of coordination complex exercises. In the experimental group (n=15) an analogical set was used but performed in water with three kinds of body submerging: at the water surface, under the water and on the bottom of the swimming-pool. Technical elements and fragments of fights were performed during the training. The ability to maintain balance was evaluated in two ways: in the vertical and horizontal body position. The balance keeping (s) was assessed on a decreased support surface, and with eyes closed. The attempts were affected in the natural environment and in water. RESULTS: Results showed improved movement coordination as a consequence of the performed set of proposed exercises. The time of maintaining vertical position was longer than when performing attempts in horizontal position, and that applied both to attempts in natural conditions, as well as in water. CONCLUSIONS: In order to develop movement coordination among those practicing martial art sports, it is suggested that exercises in a swimming-pool with various kinds of body submerging should be applied during training sessions (e.g. with wrestlers). This specific and versatile environment enables competitors to obtain immediate information serving the evaluation of the results of future reactions.

Talae, M., Nazem, F., & Ranjbar, K. (2017). The impact of rapid weight loss (4%) on leptin, adiponectin, and insulin resistance in elite adult free style wrestlers. *Journal of Sports Medicine & Physical Fitness*, 57(4), 434-440. doi:10.23736/S0022-4707.16.06004-7
BACKGROUND: The effect of rapid weight loss program on adipocytokines is not yet clear. Therefore, the aim of the present study was the effect of rapid weight loss (4%) on leptin, adiponectin, and insulin resistance in elite free style wrestlers. METHODS: For this purpose, fifteen young freestyle wrestlers (weight 67.6 ± 0.8 , BMI 22.5 ± 0.21 kg/m², body fat percent 6.12 ± 0.18 , waist to hip circumference ratio 0.82 ± 0.08) in two weight categories (60 and 66 kg) were randomly selected. Caloric intake (mean 7 days measured by Food analyzer software) measured at 1 week before weight loss program by standard methods. Wrestlers performed a week rapid weight loss (average of 4% of body weight loss) protocol by caloric and water restriction by 60% (600-700 kcal per day), under the supervision of their coach. Anthropometric characteristics, leptin, adiponectin and insulin resistance were measured before and 12 and 36 hours after rapid weight loss program. RESULTS: Rapid weight loss program with 4% of weight loss had a significantly reduced impact on anthropometric factors; leptin level, insulin resistance, and increased beta cell function, while the changes of adiponectin were not significant after rapid weight loss. CONCLUSIONS: Findings of this study shows that rapid weight loss program significantly decreased leptin, L/A ratio and HOMA-1R, without significant changes on adiponectin levels. These changes may have harmful physiological effects on wrestlers' bodies but they can be useful to regulate of fatty acid, glucose metabolism, and insulin resistance.

Taskiran, C., Aak, M., Korkmaz, M.F. (2017). Foot Posture Distortions Observed in Wrestlers. *International journal of wrestling science*, 7(1).

The aim of this study is to investigate the foot postures of athletes who just started wrestling at the ages of 11–21. A total of 685 athletes participated in the study. Sole measurements were conducted by a photographic imaging device and the Staheli index was 5 employed. As a result of the conducted study, it was concluded that foot posture distortion of new candidate wrestlers was 10.6%, active free wrestlers was 25.7%, and active Greco-Roman wrestlers was 15.6%. It was also observed that there were significant differences in the statistical comparisons of every group.

Tavares Junior, A. C., & Drigoade, A. J. (2017). Application of training periodization models by elite judo coaches. *Archives of Budo*, 13, 139-146.

Background and Study Aim: Periodization and structured training models are prominent concepts in the field of sports science. Nevertheless, the structure of the training of Brazilian elite judo athletes and the periodization models used remain unclear. This study investigated how coaches of high-performance judo athletes plan and organise the sports preparation process. Therefore, we aimed to answer the following questions: Do the coaches in this study use sports training periodization to prepare their athletes? Which periodization models do they employ? Is there a preferred periodization model used by this group? Material and Methods: Eight judo coaches took part in this research. The subjects were purposely selected and met at least two of the following inclusion criteria: being a National Club Grand Prix finalist, being coach of the athletes of the Brazilian national team (junior to 18+ years) and being a member of the Brazilian Judo Confederation coaching staff. A semi-structured interview was used for the investigation. Results: The participants were divided into two groups: Group 1, composed of six coaches who adopted a classic periodization model following Matveev's theory and Group 2, consisting of two coaches

who used a current periodization model following Verkhoshansky and Tschien's theories. Conclusions: Our analyses revealed that the coaches in this study applied the precepts of theoretical constructions in sports training periodization as the basis of planning and structuring the training regimen. This sample showed a preference for Matveev's classic periodization model (six out of the eight coaches).

- Tayebi, S. M., Mahmoudi, A. A., Shirazi, E., & Sangi, M. (2017). Acute Response of Some Iron Indices of Young Elite Wrestlers to Three Types of Aerobic, Anaerobic, and Wrestling Exercise. *Montenegrin Journal of Sports Science & Medicine*, 6(1), 5-11. The present study was conducted to investigate the acute responses of some iron indices of young elite wrestlers to three types of aerobic, anaerobic, and wrestling exercises. A total of 24 elite volunteer wrestlers were randomly categorized into three groups (n=8) aerobic, anaerobic, and routine wrestling exercises. The exercises were conducted during three non-consecutive sessions within one week. The aerobic exercises included 35 min of continuous running with 130 beats per minute (BPM) on a treadmill; the anaerobic exercises included 15 min circuit movements and 15 min rest with 160 BPM, and the wrestling training included routine wrestling exercises. Blood sampling was done in the first and third sessions in order to study the acute responses which included four stages of 1 h before, immediately, 3 h, and finally 24 h after exercises. The study of the acute response to the first session showed that the type of exercise had no effect on serum iron ($p=0.57$). Furthermore, the serum ferritin ($p=0.012$) and TIBC ($p=0.006$) affected was affected by type of exercise. The study of the acute response to the second session showed that the type of exercise had no effect on serum ferritin ($p=0.731$) and TIBC ($p=0.231$), rather the serum iron was affected by the type of exercise ($p=0.01$). Conclusively, the study of acute response showed that wrestling exercises led to a decline in iron stores during exercise and reduced total iron binding capacity during a 24-h recovery period. The study of acute exercise after a short adaptation period showed that despite the fact that serum iron had no change in anaerobic and wrestling exercises over the passage of time, it changed during aerobic exercise and 24-h recovery periods. Furthermore, the progress of iron deficiency was only observed in the first stage which prevented its progress to the next stage.
- Thomson, E., & Lamb, K. (2017). Quantification of the physical and physiological load of a boxing-specific simulation protocol. *International Journal of Performance Analysis in Sport*, 17(1-2), 136-148. doi:10.1080/24748668.2017.1304048 The aim of the study was to determine the physical and physiological responses to simulated amateur boxing of 3 x 3-min rounds. Using an externally valid technical and ambulatory demand, 28 amateur boxers (mean +/- SD; age 22.4 +/- 3.5 years, body mass 67.7 +/- 10.1 kg, stature 171 +/- 9 cm) completed the protocol following familiarisation. The physiological load was determined continuously via collection of mean (HRmean) and peak (HRpeak) heart rate, breath-by-breath oxygen uptake ($\dot{V}O_2$), aerobic energy expenditure (EE (aer)), excess carbon dioxide production (CO_2 excess), ratings of perceived exertion (RPE) and post-performance blood lactate. Physical performance was quantified as the acceleration delivered to the target by punches. HR mean and HR peak were found to exceed 165 and 178 $b \cdot min^{-1}$, absolute. ($\dot{V}O_2 > 124.6 \text{ ml} \cdot \text{kg}^{-1}$, E (aer) $> 30.7 \text{ kcal} \cdot \text{min}^{-1}$ and acceleration via 78 punches $> 2697 \text{ g}$ during each round. Mean blood lactate (4.6 $\text{mmol} \cdot \text{L}^{-1}$) and CO_2 excess (438.7 $\text{ml} \cdot \text{min}^{-1}$) were higher than typical resting values reflecting a notable anaerobic contribution. RPEs reinforced the intensity of exercise was strenuous ($> 6-8$). For all measures, there were typical increases ($p < 0.05$; moderate ES) across rounds. Accordingly, boxers might consider high-intensity ($> 90\%$ $\dot{V}O_{2\text{max}}$) interval training in anticipation such exercise yields improvements in aerobic conditioning. Moreover, the current simulation protocol the boxing conditioning and fitness test could be used as a form of training per se and as a means to monitor intervention-based changes in aspects of boxing-related physiology and performance.
- Thomson, E. D., & Lamb, K. L. (2017). Reproducibility of the internal load and performance-based responses to simulated amateur boxing. *Journal of Strength & Conditioning Research (Lippincott Williams & Wilkins)*, 31(12), 3396-3402. The aim of this study was to examine the reproducibility of the internal load and performance-based responses to repeated bouts of a three-round amateur boxing simulation protocol (boxing conditioning and fitness test [BOXFIT]). Twenty-eight amateur boxers completed 2 familiarization trials before performing 2 complete trials of the BOXFIT, separated by 4-7 days. To characterize the internal load, mean (HRmean) and peak (HRpeak) heart rate, breath-by-breath oxygen uptake, aerobic energy expenditure, excess carbon dioxide production (CO_2 excess), and ratings of perceived exertion were recorded throughout each round, and blood lactate determined post-BOXFIT. Additionally, an indication of the performance-based demands of the BOXFIT was provided by a measure of acceleration of the punches thrown in each round. Analyses revealed there were no significant differences ($p > 0.05$) between repeated trials in any round for all dependent measures. The typical error (coefficient variation %) for all but 1 marker of internal load (CO_2 excess) was 1.2-16.5% and reflected a consistency that was sufficient for the detection of moderate changes in variables owing to an intervention. The reproducibility of the punch accelerations was high (coefficient of variance % range = 2.1-2.7%). In general, these findings suggest that the internal load and performance-based efforts recorded during the BOXFIT are reproducible and, thereby, offer practitioners a method by which meaningful changes impacting on performance could be identified.
- Tropin, Y. (2017). Physical fitness model characteristics in wrestling/Модельные характеристики физической подготовленности в спортивной борьбе *Slobozhanskyi R & Sports Bulletin*, 58(2), 98-101.

Purpose: to develop model characteristics of physical fitness of the qualified wrestlers. Material & Methods: analysis of scientific and methodological literature, generalization of practical experience, pedagogical testing of the level of physical fitness, methods of mathematical statistics. Tested 30 qualified Greco-Roman wrestlers, qualified from the 1st rank to the master of sports, different ages (from 18 to 23 years). Results: a set of special exercises is selected for testing the basic physical qualities of wrestlers. It is established that to test the physical fitness of wrestlers it is necessary to conduct tests of speed-strength abilities, strength endurance, agility and general and special endurance. Based on the results of pedagogical testing, model characteristics of the physical fitness of qualified wrestlers. Conclusion: analysis and representation of the model became the basis for the development of evaluation criteria and forecasting of physical fitness level.

Tropin, Y., & Чуев, А. (2017). Technical and tactical readiness model characteristics in wrestling/Модельные характеристики технико-тактической подготовленности в спортивной борьбе *Slobozhanskyi R & Sports Bulletin*, 59(3), 106-109. Purpose: to develop model characteristics of technical and tactical preparedness of highly qualified wrestlers. Material & Methods: analysis of scientific and methodological information, generalization of best practical experience, pedagogical observation, analysis of video materials of competitive activities of wrestlers, modeling, methods of mathematical statistics. The results of 75 collisions of highly skilled Greco-Roman wrestlers were analyzed and summarized. Results: identified the 10 main technical actions that are most often used by wrestlers. Based on the analysis of competitive activity developed model characteristics of technical and tactical training of highly skilled wrestlers. Conclusion: analysis and models presented were the basis for the development of evaluation criteria and predicting the level of technical and tactical preparedness.

Tropin, Y., Пономарьов, В., & Клименко, О. (2017). Interrelation of level of physical fitness with indicators of competitive activity at young wrestlers of the Greek-Roman style / Взаємозв'язок рівня фізичної підготовленості з показниками змагальної діяльності у юних борців греко-римського стилю. *Slobozhanskyi R & Sports Bulletin*, 57(1), 111-115. Purpose: to define interrelation of level of physical fitness with indicators of competitive activity at young wrestlers of the Greek-Roman style. Material & Methods: twenty young wrestlers, age of 12–13 years participated in the researches. The pedagogical testing of level of physical fitness was held, the analysis of competitive activity was carried out, and methods of mathematical statistics were applied. Results: the strong statistical interrelation between interval of the successful attack in competitive fights and 10 by backward rolls ($r=0,718$) is established; between active maintaining dual meet and speed of performance of 15 throws of the partner by tuck ($r=0,703$). Conclusions: it is defined that indicators of the general and special high-speed and power endurance are influenced on activity of maintaining dual meets at wrestlers of 12–13 years old; indicators of effectiveness and efficiency of competitive activity are influenced on the level of development of high-speed and power preparedness and dexterity.

Tünnemann, H. (2017). *Technical-tactical combat behavior in the wrestling finals of the Olympic Games 2016 in comparison to London 2012*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia. Due to television broadcasts the world takes a picture of the attractiveness not only of our sport, but also of all Olympic sports. Therefore, it is interesting to analyze the combat behavior and the technical structure of the finalist in all three styles. METHODS: Dartfish video analysis. RESULTS: The analysis of the finals of all three wrestling styles shows – with some differences – a tendency towards defense strategies, an application of low-risk techniques with low attractiveness and low technical versatility. The champions are starting the first effective attack normally about 3 minutes after the beginning of a bout. Only two main techniques predominate in Greco-Roman wrestling and female wrestling. CONCLUSIONS: This is a challenge for coaches in the current technical training and, in addition, for the long-term technical and tactical training concepts to develop more attractive techniques.

Udo, M. (2017). Dominant features and negative trends in the current World Taekwondo Federation (WTF) competition system. / Dominujące cechy i negatywne trendy w obecnym systemie współzawodnictwa Światowej Federacji Taekwondo (WTF). *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(3), 56-67. Background. The introduction of the Protector and Scoring System (PSS) laid to rest, accusations of game manipulation in WTF sport taekwondo and ended disputes regarding scoring decisions; but, at a significant cost. Problem: The current WTF taekwondo competition system, with the PSS as its core feature, has given rise to a variety of strikingly negative trends, such as the overreliance on weak, stationary kicking techniques with the front leg, a preference for relatively tall and lean but less athletic competitors, and the appearance of a variety of unconventional, and sometimes bizarre scoring techniques. This article will argue that these characteristics are interrelated and largely the result of the hurried, unmanaged introduction of the PSS, which turned taekwondo competition from a full-contact combat sport into a partly light-contact, points game. Aim. This article aims to encourage a discussion about the fundamental soundness of and necessity for the PSS. Methods. Since the topic of this article lacks broad scientific research and empirical data, the methodology of this article relies largely on an analysis of deductions, and is based on a literature review, personal experience, conversations, and observations. Results and conclusion. On a positive note, today's taekwondo leadership has finally acknowledged how the quality of taekwondo sparring and competitions has worsened, although it remains to be seen whether or not the WTF can fix the problem.

- Vanttinen, T. (2017). *Strength and training profiles of top Greco Roman wrestlers in Finland*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling", Novi Sad, Serbia.
- PURPOSE. The study presents strength and training profiles of five Finnish Greco Romanian wrestlers (59kg, 66kg, 75kg, 85kg, 98kg) who competed in Qualifying Tournaments for Rio de Janeiro Olympic Games held in 2016. METHODS: Athletes maximal strength (1 RM) was measured in 90° squat, bench press and power clean. Training diaries recorded with specifically developed mobile application were analyzed for 6 months before last Olympic Qualification Tournament (non-qualified) or 6 months before Olympic games (qualified). RESULTS: Strength tests: squat 160 200kg (2.0 2.7 x BW), bench press 120 205kg (1.8 2.4 x BW), power clean 100 145kg (1.5 1.9 x BW). Regression analysis between maximal strength and weight category: $r^2 = 0.86$ in squat, $r^2 = 0.71$ in bench press and $r^2 = 0.77$ in power clean. As an average the wrestlers practiced 10h 15min/wk (1.5h/d). The greatest number of training hours in a week was 21h (3.0h/d) during the study period. In total, training consisted of 44% wrestling, 37% strength and conditioning and 19% active recovery exercises (low intensity exercises). Wrestling sessions included 30% technique exercises, 25% matches, 16% situation battles, 15% technical and tactical matches and 13% throwing series. Strength and conditioning training included 49% endurance, 29% strength and 22% speed and explosiveness.
- CONCLUSION: The level of strength among Finnish top wrestlers was high (compared to athletes competing in other sports) but the strength did not discriminate those wrestlers qualified to Olympic Games (2 out of 5 wrestlers) from those who did not (3 out of 5). More variation between studied wrestlers was found on how much
- Vasilyev, G. F., Tiunova, O.V., Novikov, A.A. (2017). Priority issues of methodological and psychological provisions for combatants' training process *Theory and Practice of Physical Culture*, 2017(2), 20-22.
- Practical experience accumulated in any knowledge sector or industrial branch development process needs to be periodically revised and reevaluated in the context of the newly emerging information, technologies and challenges, with the relevant professional discussions being encouraged for further progress. This year made a breakthrough in operations of the combat sport coaching and athletic communities and, hence, productive discussions are needed to address a variety of issues critically important for the progress in the national martial arts. We offer this article as a starting point for such a discussion.
- Veliz, P., Boyd, C. J., & McCabe, S. E. (2017). Nonmedical Use of Prescription Opioids and Heroin Use Among Adolescents Involved in Competitive Sports. *Journal of Adolescent Health*, 60(3), 346-349. doi:10.1016/j.jadohealth.2016.09.021
- Purpose Examine the past-year prevalence of nonmedical use of prescription opioids (NUPOs), heroin use, and the concurrent NUPO and heroin in a sample of 12th graders involved in 16 different sports. Methods A secondary analysis of nationally representative data from nine cohorts (2006–2014) of the Monitoring the Future study ($n = 21,557$). Results No differences were found between 12th graders who participated in at least one competitive sport and nonparticipants with respect to past-year NUPO, heroin use, and concurrent NUPO and heroin use. Most of the 16 sports analyzed were not associated with the three drug use outcomes. However, 12th graders who participated in ice hockey had substantially greater odds of both past-year heroin use and concurrent NUPO and heroin, while those who participated in weightlifting (NUPO and heroin) and wrestling (NUPO) had slightly higher odds of using these drugs. Conclusions The study provides critical information to inform physicians, parents, and school officials of the risks associated with participating in certain high contact sports, particularly ice hockey.
- Veliz, P., McCabe, S. E., McCabe, V. V., & Boyd, C. J. (2017). Adolescent Sports Participation, E-cigarette Use, and Cigarette Smoking. *American Journal of Preventive Medicine*, 53(5), e175-e183. doi:10.1016/j.amepre.2017.06.032
- Introduction:** Although sport participation among adolescents has been found to lower the risk of traditional cigarette smoking, no studies to date have assessed if this type of physical activity lowers the risk of e-cigarette use among adolescents. Methods: National data from the 2014 and 2015 Monitoring the Future study of 12th-grade students were used and analyses were conducted in 2016. Measures for past 30-day e-cigarette use and traditional cigarette smoking were used to assess differences between adolescents who participated in at least one competitive sport during the past year and adolescents who did not. Differences in e-cigarette use and traditional cigarette smoking were assessed between 13 different sports to determine which sports were associated with a greater or lower risk of these behaviors. Results: Adolescents who participated in at least one competitive sport were less likely to engage in past 30-day traditional cigarette smoking (AOR=0.73, 95% CI=0.538, 0.973) and past 30-day dual use of traditional cigarettes and e-cigarettes (AOR=0.66, 95% CI=0.438, 0.982) when compared with their nonparticipating peers. Adolescents who participated in baseball/softball and wrestling were at greatest risk of e-cigarette use. Of the 13 assessed sports, none were found to lower the odds of e-cigarette use. Conclusions: No significant evidence was found that participation in a sport was a protective factor against e-cigarette use. Certain types of athletes are at an elevated risk of e-cigarette use, and prevention efforts targeted at these specific sports should be considered by school administrators.
- Veliz, P., Schulenberg, J., Patrick, M., Kloska, D., McCabe, S. E., & Zarett, N. (2017). Competitive sports participation in high school and subsequent substance use in young adulthood: Assessing differences based on level of contact. *International Review for the Sociology of Sport*, 52(2), 240-259. doi:10.1177/1012690215586998

The objective of this study is to examine how participation in different types of competitive sports (based on level of contact) during high school is associated with substance use 1 to 4 years after the 12th grade. The analysis uses nationally representative samples of 12th graders from the Monitoring the Future Study, who were followed 1 to 4 years after the 12th grade. The longitudinal sample consisted of 970 12th graders from six recent cohorts (2006–2011). The analyses, which controlled for 12th grade substance use, school difficulties, time with friends, and socio-demographic characteristics, found that respondents who participated in at least one competitive sport during the 12th grade had greater odds of binge drinking during the past two weeks (AOR = 2.04; 95% CI = 1.43, 2.90) 1 to 4 years after the 12th grade, when compared to their peers who did not participate in sports during their 12th grade year. Moreover, respondents who participated in high-contact sports (i.e. football, ice hockey, lacrosse, and wrestling) had greater odds of binge drinking (AOR = 1.80; 95% CI = 1.18, 2.72), and engaging in marijuana use during the past 30 days (AOR = 1.81; 95% CI = 1.12, 2.93) 1 to 4 years after the 12th grade when compared to their peers who did not participate in these types of sports during their 12th grade year. Accordingly, the findings indicate important distinctions in sport participation experiences on long-term substance use risk that can help inform potential interventions among young athletes.

Visiedo, A., & Palao, J. M. (2017). Effect of educational training on nutrition and weight control in under-18 Spanish wrestlers. *Motriz: Revista de Educação Física*, 23(1), 76-80. doi:10.1590/s1980-6574201700010012

Abstract The aim of this study was to investigate the effect of a formative program concerning nutrition, weight control, and its risks wrestlers under the age of 18 (under-18) at the Spanish national level. The sample comprised 36 under-18 wrestlers that were pre-selected for the Spanish national team. A quasi-experimental design with a pre-test and post-test was used. The dependent variables were the knowledge of nutrition and weight control and its risks. The independent variable was the educational program. The program had three 30-minute sessions that combined talks, videos, and tasks to complete. Descriptive and inferential analyses were done (t-test, Wilcoxon test). Results indicate that the educational program was effective at increasing under-18 wrestlers' knowledge about weight control and its risks, but was ineffective with regard to nutrition knowledge. The paper concludes with a discussion regarding the effect of the intervention program, the difficulties with including this type of knowledge and skill in the preparation of combat sport athletes, and the need for further research in this area.

Vracan, D., Baic, M., & Starcevic, N. (2017). Ambidexterity and performance in wrestling. *Acta Kinesiologica*, 11, 12-16.

Wrestling is a very complicated and demanding sporting activity of high intensity in which movements are performed in variable conditions symmetrically around all axes and planes, and in all directions. However, the wrestling training practice so far is such that learning and improving of the wrestling techniques in most cases is conducted on one side, which is severely criticized nowadays by trainers in practice and scientific workers. The basic aim of this research was to establish the relations between the symmetrical and asymmetrical method of learning and improving wrestling techniques and success in wrestling. The research was conducted on a sample of 115 beginner wrestlers, aged 19 to 21 years, divided in the experimental and control group. The experimental group was subjected to the training programme of learning and improving the wrestling techniques on both sides symmetrically, whereas the control group conducted the traditional training programme of learning and improving the wrestling techniques on the predominant side only asymmetrically. After the conducted program, lasting 48 hours, the differences between the experimental and control group in the area of the selected situational parameters in a wrestling bout were determined. The research results clearly show that planned and programmed training process of symmetrically conducted training resulted in statistically higher success rate in the beginner wrestlers. The beginner wrestlers that conducted the training programme symmetrically obtained statistically higher results in all situation variables used in this research. On the basis of this research results, the application of symmetrical learning and improving the wrestling techniques in the process of training from the beginning of practice, i.e. from the first inclusion in the training process, is recommended.

Weinberg, R., & Butt, J. (2017). Part II: Introduction Mental Toughness. *International journal of sport psychology*, 48(3), 278-279.

The article presents an introduction to the special issue on mental toughness. This is the second part of the special issue on mental toughness and begins with an article by the Issue's Editors Joanne Butt and Robert Weinberg, and co-authors Kathleen Mellano and Robert Harmison. This article focuses on the stability of mental toughness by exploring possible fluctuations across competitive situations and associated cognitions, affect, and behaviors. Following this article, Andrew Driska, Daniel Gould, Scott Pierce, and Ian Cowburn present a detailed mixed methods investigation on psychological changes in adolescent wrestlers during an intensive training camp. Previous research indicates that creating adversity in the training environment can facilitate the development of mental toughness.

Wei-Ying, C., Wu, S. K., Tai-Fen, S., Kuei-Ming, C., Kuei-Yuan, W., Yao-Ching, C., & Goodbourn, P. T. (2017). Perceptual and Motor Performance of Combat-Sport Athletes Differs According to Specific Demands of the Discipline. *Perceptual & Motor Skills*, 124(1), 293-313.

The specific demands of a combat-sport discipline may be reflected in the perceptual-motor performance of its athletes. Taekwondo, which emphasizes kicking, might require faster perceptual processing to compensate for longer latencies to initiate lower-limb movements and to give rapid visual feedback for dynamic postural control, while Karate, which emphasizes

both striking with the hands and kicking, might require exceptional eye-hand coordination and fast perceptual processing. In samples of 38 Taekwondo athletes (16 females, 22 males; mean age = 19.9 years, SD = 1.2), 24 Karate athletes (9 females, 15 males; mean age = 18.9 years, SD = 0.9), and 35 Nonathletes (20 females, 15 males; mean age = 20.6 years, SD = 1.5), we measured eye-hand coordination with the Finger-Nose-Finger task, and both perceptual-processing speed and attentional control with the Covert Orienting of Visual Attention (COVAT) task. Eye-hand coordination was significantly better for Karate athletes than for Taekwondo athletes and Nonathletes, but reaction times for the upper extremities in the COVAT task--indicative of perceptual-processing speed--were faster for Taekwondo athletes than for Karate athletes and Nonathletes. In addition, we found no significant difference among groups in attentional control, as indexed by the reaction-time cost of an invalid cue in the COVAT task. The results suggest that athletes in different combat sports exhibit distinct profiles of perceptual-motor performance.

Yamashita, D., Arakawa, H., Wada, T., Yumoto, K., Fujiyama, K., Nagami, T., Shimizu, S. (2017). *Physical and anthropometric profile of international-level Japanese male freestyle wrestlers*. Paper presented at the International scientific and professional conference on wrestling: "Applicable research in wrestling." Novi Sad, Serbia.

PURPOSE: The purpose of the study is aimed to compare physical and anthropometric characteristics of international- and collegiate-level Japanese male freestyle wrestlers, belong to the light weight category. METHODS: Twenty Japanese male freestyle wrestlers belonging to the light weight category (former 55-, 60-, or 66-kg) were categorized into 2 groups. First group composed of 11 international-level wrestlers including 3 Olympic medalists. Second group composed of 9 collegiate-level wrestlers. Body composition was assessed by multi-frequency bioimpedance analysis device with 8-point contact electrodes. Isokinetic concentric knee and hip extension and flexion torque were measured using an isokinetic dynamometer. Morphological data was obtained by means of a three-dimensional scanning method. Twelve circumferences (neck, upper arms, forearms, thighs, lower legs, chest, waist, and hip) and four lengths (arms and legs) were computed. Simple reaction time was evaluated using an electronic device. Comparisons of these variables between the two groups were performed by unpaired t-tests. RESULTS: The results showed there was no difference in body composition, body circumferences, and limb length between groups other than chest circumference ($p < 0.05$). There was no difference in hip and knee strength and simple reaction time between groups. CONCLUSIONS: These results suggested that chest circumference is important to become an international-level wrestler. Also, other aspects such as multi-joint motor skills, technical and/or tactical skills may be important for international-level wrestlers.

Yang, W.-H. H., O.; Mester, J.; Grau, M. (2017). Impact of rapid weight reduction on health and performance related indicators of athletes representing the Olympic combat sports. *Archives of Budo*, 13(1), 147-160.

Background and Study Aim: Rapid weight reduction (RWR) may cause a potential health risk and decreases athletic performance. The cognitive goal of this review is to summarise profound aspects of RWR by Olympic combat sports athletes (boxing, judo, taekwondo and wrestling). Material & Methods: A comprehensive literature search was performed to identify articles on the specific contexts of RWR in this review. Extensive literature research was conducted using PubMed and Google Scholar with relevant keywords applied. Results: RWR methods used by the athletes include food restriction, dehydration and intensive exercise. After RWR increased oxidative stress, an imbalance of electrolytes and hormones, decreased glycogen or changes in blood flow, as well as decreased plasma volume, have been reported. Hemorheological properties such as deformability and aggregation of red blood cells are impaired after RWR, which may in part be related to impaired nitric oxide generation. Further, RWR was associated with a peak value of plasminogen activator inhibitor-1 (PAI-1) in the morning of the human circadian system which also damages cardiovascular events and endangers their health. RWR related impairments included impaired oxygen consumption, aerobic and anaerobic capacity, muscle strength, psychological concentration and targeted sport-specific performance of combat sports athletes. Conclusion: A long-term plan for weight reduction should be individually created, and body weight of athletes should precisely be controlled. If RWR is preferred as weight loss, athletes and coaches should avoid high-intensity training in the morning during RWR due to impaired physiological responses. International, National and Regional federations of Olympic combat sports should control weight cutting.

Yoon, J. R., Jeon, H. S., & Kim, J. H. (2017). Effects of normobaric hypoxia exposure on anaerobic and aerobic performances after sprint interval training. *Gazzetta Medica Italiana Archivio Per Le Scienze Mediche*, 176(3), 110-118. doi:10.23736/s0393-3660.16.03272-1

BACKGROUND: The purpose of this research was to evaluate the new concept's highland training effect called "living high-training low (LHTL) along with the Sprint Interval Training (SIT)". METHODS: The training was executed in an altitude of around 600m-1,200m. Moreover, the training was conducted for a total of six weeks (4 weeks' training and 2 weeks' recovery) by elite level college wrestling athletes in the altitude of 2500-4000 m with the living high - train low figure. The experimental group (LHTL) executed SIT along with the hypoxic training, and the control group (CON) only executed SIT. The hypoxic training was executed 5 times a week for 8 hours a day. SIT was executed 3 times a week and both groups executed SIT twice a day. RESULTS: Time, VO₂max, and VEmax showed significant increase in the aerobic exercise skill variable (time, VEmax: Pre vs. 3000, 3500, 4000 m; VO₂max: Pre vs. 3500, 4000 m). Also, in the anaerobic exercise, skill variable due to WAnT, LHTL group especially showed significant increase in PP (W, W/kg) (W: Pre vs. 3500, 4000 m; W/kg: Pre vs. 3000, 3500, 4000 m), and CON

group showed significant increase in peak power (W) in the results (Pre vs. 4000 m, Rec. 1, Rec. 2). CONCLUSIONS: CON group showed the tendency to show effect due to SIT in the anaerobic variable and LHTL showed that comprehensive effect of hypoxic training as well as SIT took effect.

Young, L. M., Motz, V. A., Markey, E. R., Young, S. C., & Beaschler, R. E. (2017). Recommendations for Best Disinfectant Practices to Reduce the Spread of Infection via Wrestling Mats. *Journal of Athletic Training, 52*(2), 82-88.

Context: At the request of the National Wrestling Coaches Association and the head wrestling coach at our university, we conducted a study of infection transmission in collegiate wrestlers. Objective: To examine disinfectant effectiveness and develop best-practice guidelines for minimizing the spread of skin infections via wrestling mats. Design: Controlled laboratory study and crossover study. Setting: Laboratory and two 15-college wrestling invitational meets. Patients or Other Participants: A total of 231 collegiate wrestlers and 8 officials. Intervention(s): In the laboratory-based part of the study, we measured the bacterial load of mats disinfected with 10% bleach, OxiTitan, Benefect, eWater, and KenClean and inoculated with *Staphylococcus epidermidis* (strain ATCC 12228) at a concentration of 6.5×10^4 bacteria/cm². In the empirical part of the study, we used these disinfectants during 2 invitational meets and measured mat and participant bacterial load during competition. Participants were swabbed at weigh-in and after their last bout. Mat bacterial load was monitored hourly. Main Outcome Measure(s): We determined total colony counts and species. Results: With controlled testing, we observed that products claiming to have residual activity reduced bacterial load by 63% over the course of competition compared with nonresidual agents. Only 4 of 182 participating wrestlers tested positive for methicillin-resistant *Staphylococcus aureus*, which is the normal population occurrence. The predominant species on mats were skin bacteria (*Staphylococcus epidermidis*) and substantial levels of respiratory bacteria (*Streptococcus pneumoniae*), as well as several soil species and a surprisingly low incidence of fecal bacteria (*Escherichia coli*). Disinfectant effectiveness during the meets was consistent with controlled study findings. Cleaning mats with residual disinfectants reduced the average bacterial load by 76% compared with nonresidual cleaners. Using a footbath did not reduce the bacterial load compared with a bleach-cleaned mat, but using alcohol-based hand gel reduced it by 78%. Conclusions: Best practices based on these data include backward mopping of the mats with a residual disinfectant pulled behind the cleaner, allowing mats to dry before walking on them, having wrestlers use hand gel before each bout, and strongly recommending that all wrestlers receive annual influenza vaccinations.

Zebrowska, A., Trybulski, R., Rocznik, R., & Marcol, W. (2017). Effect of Physical Methods of Lymphatic Drainage on Postexercise Recovery of Mixed Martial Arts Athletes. *Clinical journal of sport medicine: official journal of the Canadian Academy of Sport Medicine*. doi:10.1097/jsm.0000000000000485

OBJECTIVE: Physical methods are reported to be important for accelerating skeletal muscle regeneration, decreasing muscle soreness, and shortening of the recovery time. The aim of the study was to assess the effect of the physical methods of lymphatic drainage (PMLD) such as manual lymphatic drainage (MLD), the Bodyflow (BF) therapy, and lymphatic drainage by deep oscillation (DO) on postexercise regeneration of the forearm muscles of mixed martial arts (MMA) athletes. DESIGN AND METHODS: Eighty MMA athletes aged 27.5 ± 6.4 years were allocated to 4 groups: MLD, the BF device, DO therapy, and the control group. Blood flow velocity in the cephalic vein was measured with the ultrasound Doppler velocity meter. Maximal strength of the forearm muscles (Fmax), muscle tissue tension, pain threshold, blood lactate concentration (LA), and activity of creatine kinase were measured in all groups at rest, after the muscle fatigue test (post-ex) and then 20 minutes, 24, and 48 hours after the application of PMLD. RESULTS: The muscle fatigue test reduced Fmax in all subjects, but in the groups receiving MLD, DO, and BF significantly higher Fmax was observed at recovery compared with post-ex values. The application of MDL reduced the postexercise blood LA and postexercise muscle tension. CONCLUSIONS: The lymphatic drainage methods, whether manual or using electro-stimulation and DO, improve postexercise regeneration of the forearm muscles of MMA athletes. The methods can be an important element of therapeutic management focused on optimizing training effects and reducing the risk of injuries of the combat sports athletes.

Zembron-Lacny, A., Ziemann, E. W. A., Zurek, P., & HÜBner-Wozniak, E. (2017). Heat shock protein 27 response to wrestling training in relation to the muscle damage and inflammation. *Journal of Strength & Conditioning Research, 31*(5), 1221-1228.

One of the unique features of an exercise is that it leads to a simultaneous increase of antagonistic mediators. On the one hand, exercise elevates catabolic proinflammatory cytokines. On the other hand, exercise stimulates anabolic components such as heat shock proteins (HSPs), which protect against stressors. Therefore, the study was designed to evaluate the blood level of HSP27 and its relationship with muscle damage and inflammatory mediators in elite Greco-Roman wrestlers during training periods differed in type and intensity exercise. Ten male wrestlers (21.2 ± 2.1 years) were observed during the conditioning camps at preseason (January), at the beginning of tournament season (April), and during tournament season (June). Twelve healthy and untrained men (19.2 ± 0.4 years) were considered a reference group. The serum levels of inflammatory mediators and HSP27 in wrestlers were significantly different from non-athletes. In wrestlers, reactive oxygen and nitrogen species H₂O₂, NO, and 3-nitro, cytokines interleukin-1 b and tumor necrosis factor a, and also HSP27 reached the highest levels at preseason (January) or tournament season (June) when the special training predominated (>30% training load) over directed training (approximately 10% training load). Creatine kinase activity also demonstrated the highest level during the same training periods (January $2,315 \pm 806$ IU·L⁻¹ June $3,139 \pm 975$ IU·L⁻¹). The regression analysis revealed the relationship of HSP27 level

with muscle damage ($r_s = -0.613$, $p < 0.001$), and also with inflammatory mediators. The results of this study show that wrestling training modulates HSP27 level, which is significantly related with skeletal muscle damage and inflammatory response, and suggest that measure of HSP27 level can be useful diagnostic tool in biochemical assessment of athletes to increase their performance.

Ziyagil, M. T., M. (2017). Multiple sprints performance and fatigue level between Turkish national male senior free and greco-roman styles' wrestlers. *Kinesiologia Slovenica*, 23(2), 55-64.

Multiple sprints test (MST) is a useful tool for testing directly the efficiency of phosphagen system and indirectly the efficiency of MaxVO₂ enhancing capacity to recover between sprints. The aim of this study is to compare the physical characteristics and multiple sprints performance and sprints induced fatigue level between male Turkish National Free Style Wrestlers (FSW) and Greco-Roman Styles Wrestlers (GSW). The data were collected from 25 FSW and 21 GSW at male senior level. Speed and reduction in speed level were tested by MST. A t-test was used for comparing two-groups. Also, correlations coefficients were calculated among variables. The results of this study showed that GSW were more explosive during the first 10 m part, while FSW were faster at the second 10 m part of each 20 meters sprint. No significant difference was observed between the two styles in the mean 20 m sprinting speed during MST. Sprints variables showed negative correlation with physical characteristics in two styles but level of wrestlers was only correlated with first 10 m sprint speed in GSW. The ability to resist anaerobic fatigue in GSW was higher than FSW during repeated sprints. In conclusion, the intensity, the number of intervals and duration of explosive exercises should be based on the scores of GSW and FSW depending on the demand of wrestling in MST.

Zubac, D., Cular, D., & Marusic, U. (2017). Reliability of Urinary Dehydration Markers Among Elite Youth Boxers. *International journal of sports physiology and performance*, 1-26. doi:10.1123/ijspp.2016-0621

PURPOSE: The aim of the present study was to determine the reliability and diagnostic accuracy of non-invasive urinary dehydration markers, in field-based settings on a day-to-day basis in elite adolescent amateur boxers. METHODS: Sixty-nine urine samples were collected on a day-to-day basis, from twenty-three athletes (17.3 ± 1.9 y), during their weigh-stable phase and analyzed by field and laboratory measures of hydration status. Urine osmolality (UOSM), urine specific gravity (USG), total protein content (TPC) and body-mass (BM) stability were evaluated to determine fluid balance and hydration status. The overall macronutrient and water intake were determined using dietary records. According to their anthropometric characteristics, athletes were assigned into two groups: light-weight (LWB) and heavy-weight (HWB) boxers. RESULTS: Data presented on UOSM demonstrated a uniform increment by $11.2 \pm 12.8\%$ (LWB) and $19.9 \pm 22.7\%$ (HWB) ($p < 0.001$), over the course of the study, even during the weight-stable phase (BM, ICC=0.99) and ad libitum fluid intake (42 ± 4 mLkg⁻¹day⁻¹). The intra-class correlation coefficients (ICC-s) ranged from 0.52-0.55 for USG to 0.38-0.52 for UOSM, further indicating inconsistency of the urinary dehydration markers. Poor correlations were found between USG and TPC metabolites ($r=0.27$, $p=0.211$). CONCLUSIONS: Urinary dehydration markers (both USG and UOSM) exhibit high variability and seem to be unreliable diagnostic tools to track for actual body-weight loss in real-life scenario. The ad libitum fluid intake was apparently inadequate to match acute fluid-loss during and following intense preparation. The applicability of a single time-point hydration status assessment concept may preclude accurate assessment of actual body-weight deficit(s) in youth boxers.