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PROGRESO PARA NUESTRO DEPORTE MEDIANTE CONOCIMIENTO

2018

# Annual Compilation of Wrestling Research



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**The Annual Compilation of Wrestling Research 2018** is compilation of published wrestling-related research published during 2018 and 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 500 academics, scientists, doctors and wrestling professionals, from 80 countries who are involved with the sport of wrestling. ([www.inwr-wrestling.com](http://www.inwr-wrestling.com)) Our Mission Statement is:

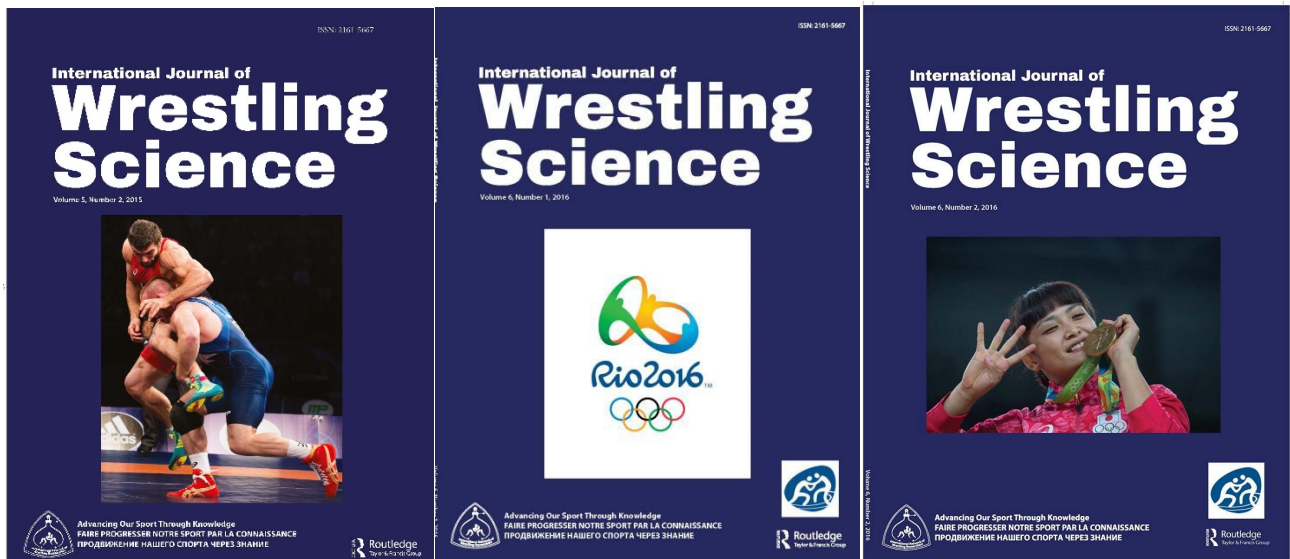
*The International Network of Wrestling Researchers (INWR) seeks to facilitate the development of wrestling around the world by drawing all wrestling sport science professionals together, in a manner that through our international and intercultural cooperation we are empowered to support the development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

We have organized scientific meetings at the 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 Award** 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 by Christo Christov commissioned 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.



You are invited to register with the International Network of Wrestling Researchers (INWR). by sending:

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## 2018 Wrestling Research Bibliography

- Alves, R. C., Alves Bueno, J. C., Borges, T. O., Zourdos, M. C., de Souza Junior, T. P., & Aoki, M. S. (2018). Physiological Function Is Not Fully Regained Within 24 Hours of Rapid Weight Loss in Mixed Martial Artists. *Journal of Exercise Physiology Online*, 21(5), 73-83.
- The aim of this study was to examine the effects of rapid weight loss (RWL) on body mass (BM), strength, and hydration status, and its effects on fight performance in mixed martial artists (MMA). Athletes had BM, handgrip strength, and hydration status assessed at baseline (the official match weigh-in) and at match time 24 hrs later. There were statistically significant changes and very large and large effect sizes (ES) demonstrating decreased BM and handgrip strength, and increased urine density from baseline to match time, indicating that athletes could not fully restore physiological function within the 24 hrs between the official weigh-in and match time. However, at match time only 2 subjects were well-hydrated, while 5 subjects had minimal dehydration, and 5 subjects were significantly dehydrated. Therefore, the findings indicate that the negative effects of RWL on physiological function are not fully regained in the 24-hr period between the official weigh in and the start of a match in MMA athletes.
- Amorim Zandoná, B., de Macedo, A. C. G., de Oliveira, C. d. S., de Carvalho Perin, S., Alves, R. C., De Camargo Smolarek, A., . . . Navarro, A. C. (2018). Consequences of body weight rapid reduction in athletes of combat sports / CONSEQUÊNCIAS DA RÁPIDA REDUÇÃO DE PESO CORPORAL EM ATLETAS DE ESPORTES DE COMBATE E A IMPORTÂNCIA DA NUTRIÇÃO: UMA REVISÃO. / and the importance of nutrition: a review. *Revista Brasileira de Nutrição e Esportiva*, 12(70), 143-159.
- Arslan, F., Ziyagil, M. A., & Bastik, C. (2018). Examination of Moral Decision-Making Attitudes of Elite Male Basketball Players and Wrestlers According to Variables of Sport Experience and Mother, Father Education. *Universal Journal of Educational Research*, 6(3), 378-385.
- The purpose of this research was to examine the extent to which sport moral decision-making attitudes were applied by the athletes, and the factors that caused it. The research was based on the causal comparative research model. The research group consisted of a total of 475 athletes, of which 195 were basketball athletes randomly selected from seven geographical regions and 280 were wrestling athletes. Lee, Whitehead, and Ntoumanis used data collection tools to measure the moral decision-making attitudes of athletes (Attitude Moral Decision Making in Youth Sport Questionnaire--AMDYSQ). Gürpınar has adapted the "Moral Decision-Making Attitudes Scale in Infrastructure Sports" to Turkish culture. Mann Whitney-U test was used in binary comparisons because data were not normally distributed. As a result of the research, significant differences were found according to subscales of moral decision-making attitudes in infrastructure sports, such as wrestling and basketball, according to the subscale of adopting competition affinity, cheating, and winning fairness. In individual and team sports, it can be said that the athletic experiences are firstly influenced by the educational level of the parents after the athletes gain moral behaviors. The results of the research were supported by the literature. [This study was presented in the ERPA International Congress on Education, p.87, held in June, 02-04, 2016, Sarajevo in Bosnia and Herzegovina.]
- Bagwell, M. S., Wilk, K. E., Colberg, R. E., & Dugas, J. R. (2018). The use of serial platelet rich plasma injections with early rehabilitation to expedite grade iii medial collateral ligament injury in a professional athlete: a case report. *International Journal of Sports Physical Therapy*, 13(3), 520-525.
- Background: Medial collateral ligament (MCL) injuries are one of the most commonly treated knee pathologies in sports medicine. The MCL serves as the primary restraint to valgus force. The large majority of these injuries do not require surgical intervention. Case Subject Description: A 30-year-old professional wrestling athlete presented to the clinic with acute complaints of right medial knee pain resulting from a traumatic valgus force. Physical exam revealed Grade 3 MCL injury. Magnetic resonance imaging confirmed clinical diagnosis of a Grade 3 proximal MCL tear. This athlete had sustained a prior grade 3 ACL injury with Grade 3 distal MCL injury which required surgery to reconstruct the ACL and repair the MCL 13 months prior, in November of 2015. Outcomes: The subject was successfully treated with a series of three sequential Leukocyte Rich Platelet Rich Plasma (LR-PRP) Injections spaced evenly one week apart in addition to an early physical therapy regimen. The total treatment time was cut down from an expected 35-49 days to 31 days. Discussion: When paired with the appropriate rehabilitation treatment progression, the use of LR-PRP injections in the treatment of an isolated MCL tear was beneficial for this subject. Conclusion: The results of this case report indicate that the use of LR-PRP and early

rehabilitation shows promise in treating an acute grade 3 MCL injury. Future research utilizing randomized controlled trials are needed.

- Barley, O. R., Chapman, D. W., & Abbiss, C. R. (2018). Weight Loss Strategies in Combat Sports and Concerning Habits in Mixed Martial Arts. *International Journal of Sports Physiology & Performance*, 13(7), 933-939.  
Context: Combat sports are typically divided into weight classes, and body-mass manipulation to reach a weight class is commonplace. Previous research suggests that weight loss practices in mixed martial arts (MMA) may be more extreme than in other combat sports. Purpose: To investigate the magnitude of weight loss and the prevalence of weight loss strategies in different combat sports. Methods: Competitors (N = 637) from Brazilian jiu-jitsu, boxing, judo, MMA, Muay Thai/kickboxing, taekwondo, and wrestling completed an online questionnaire seeking information regarding their weight loss practices. Results: Body-mass manipulation was commonly undertaken by all combat-sport athletes, with a particularly high incidence of gradual dieting, increased exercise, and fluid restriction. Skipping meals was higher in taekwondo and wrestling (84%) compared with the other combat sports (~58%), whereas 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%) while 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 help support staff 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.
- Bavykin, E. A., Сидоренко, С. А., Бавыкин, Е. А., & Зиновьев, Н. А. (2018). Academic wrestlers' age-specific technical and tactical progress control/ОСОБЕННОСТИ ТЕХНИКО-ТАКТИЧЕСКОГО МАСТЕРСТВА БОРЦОВ-СТУДЕНТОВ НА РАЗНЫХ ВОЗРАСТНЫХ ЭТАПАХ. *Teoria i praktika fiziceskoj kul'tury* (4), 60-62.  
The study makes a comparative analysis of the competitive performance profiles of the junior wrestlers who competed in the 2017 World Wrestling Championship. The study data and analysis made it possible to profile the individual competitive performances of the junior wrestlers versus their age-specific competitive technical and tactical progress data. The wrestlers' competitive technical and tactical actions (TTA) were rated using the following rating criteria: scoring TTA; points scored; points lost; scoring attacking TTA; scoring counterattacking TTA; scoring opponent's attacks; countered attacks; and the scoring attacks intervals (SAI). The study found the beginner-junior wrestlers' bouts being faster versus the mature-junior bouts, with higher percentages of the fall wins and clear-advantage wins that are attributable to more deficiencies in the physical and tactical fitness levels of the athletes. As far as the wrestlers' activity is concerned, the beginner juniors were highly active that may be interpreted as their proneness to risky and reckless fight control styles. The study findings may be applied as a sound basis for the academic wrestlers' training system designs and plans.
- Bemfato Dezan, D., Bigliassi, M., Afonso Montes, F., & Cardoso Dezan, G. C. (2018). Warm-up activity does not produce potentiation post-activation in wrestling athletes / ATIVIDADE CONDICIONANTE NÃO GERA POTENCIAÇÃO PÓS-ACTIVAÇÃO EM ATLETAS DE LUTA OLÍMPICA. *Revista Brasileira de Prescrição e Fisiologia do Exercício*, 12(76), 582-589.  
The aim of the present study was to investigate the effects of a warm-up activity on the potentiation post-activation (PPA) in wrestling athletes. 8 wrestling athletes (22.1 ± 3.4 yrs; 70.5 ± 10.2 kg; 170.1 ± 0.1 cm) performed two experimental conditions (CPPA and CC). Three sets of six counter movement jumps represented the CPPA and such condition has been compared to CC, where no previous activity has happened. The experimental conditions have been separated by a minimum of 48 and a maximum of 168 hours of difference and they have been also randomized. Three attempts were done and the best score was used. The jump performance was assessed using the Ergojump® equipment and the data were analyzed through the Kinematic Measurement System® software. The "t" Student test has been applied for non-paired comparisons and the significance was set at 5%. The outcomes of the present study demonstrated no PPA effect (SJ - CC: 0.383 ± 0.063 m vs CPPA: 0.431 ± 0.069 m; p = 0.79), (CMJ - CC: 0.41 ± 0.035 m vs CPPA: 0.44 ± 0.031 m; p = 0.96). In conclusion, the warm-up activity proposed by this study was not capable to induce PPA in wrestling athletes.
- Berk, E., & Demirel, A. (2018). Assessment of Pulse Wave Velocity as Arterial Stiffness Parameter in Adolescent Elite Wrestlers. / Adolesan Elit Güreşçilerde Arteriyel Sertlik Parametresi Olarak Nabız Dalga Hızının Değerlendirilmesi. *Spor hekimligi dergisi/Turkish journal of sports medicine*, 53(4), 167-173.  
Objective: To compare the arterial stiffness parameter in adolescent elite wrestlers who perform regular heavy exercise with the sedentary control group in the same age range. Materials and Methods: A group of 23 male wrestlers and a control group of 23 nonathlete males of the same age were compared. The age, height, body weight, resting pulse and blood pressure measurements of the subjects were performed. Pulse wave velocity (PWV) was measured using a photoplethysmography device. Results: There was no significant difference for age in the athlete (16.0 ± 1.1 yrs) and control groups (15.9 ± 0.9 yrs) (p>0.05). Body mass index (BMI) levels of the

control group ( $19.5 \pm 2.4$  kg/m<sup>2</sup>) were significantly lower than those of the athlete group ( $23.6 \pm 3.8$  kg/m<sup>2</sup>) ( $p < 0.001$ ). Resting heart rate and arterial blood pressure levels ( $67.0 \pm 8.0$  beats/min and  $100 \pm 6 / 70 \pm 5$  mmHg, respectively) of the athletes was significantly lower ( $p < 0.001$ ) than those of the control group ( $78 \pm 7$  beats/min and  $111 \pm 8 / 81 \pm 3$  mmHg, respectively). The PWV scores of the control group ( $4.66 \pm 0.16$  m/s) were significantly higher than those of the athlete group ( $4.41 \pm 0.18$  m/s), ( $p < 0.001$ ). Conclusion: Arterial stiffness is an independent assessment of cardiovascular disease and mortality for athletes. This study, which aims to evaluate the effects of exercise on arterial stiffness with PWV measurement in adolescent wrestlers, is believed to help determining how arterial function responds to intense exercise practice.

Biveghe Assoumou, C., & Wane, C. T. (2018). Yékini, le roi des arènes ou la lutte sénégalaise entre pratique sportive et tradition [Yékini, the king of the arena or the Senegalese fight between sports practice and tradition]. *Society & Leisure / Loisir & Société*, 41(2), 214-232.

One cannot tackle the issue of sports in Senegal without mentioning the 'Lamb,' a traditional form of wrestling. A true cultural and social phenomenon, the Lamb stands out as Senegal's most popular sport but also as a specific physical practice that is specific to that country. The comic book Yékini, le roi des Arènes ('Yékini, King of the Arenas') by Lugrin and Xavier, published in 2014, tells the story of Yékini, Tyson, and Balla Gaye II, three outstanding Senegalese wrestlers who vie for the title of king of Dakar's arenas. This article deals with Senegalese wrestling, both as a competitive, performance-driven sports practice, and as an aestheticized physical practice which resonates with Senegal's cultural tradition, displaying a network of symbolic, social, and mystical meaning. This network is embodied by the comic's heroes, as Yékini, Tyson, and others engage, in competing ways, with the definition of what tradition is, has been, or should be like.

Boltikov, V. V., Solomakhin, O.B., Konovalov, I.E. (2018). Technical and tactical skills building in modern greco-roman wrestling supported by motivation-and-compulsion system/ПО ВЫШЕНИЕ ТЕХНИКО -ТАКТИЧЕСКО Й ПОДГОТОВЛЕННОСТИ БОРЦОВ В ГРЕКО -РИМСКОГО СТИЛЯ ПОСРЕДСТВОМ ВНЕДРЕНИЯ СИСТЕМЫ МОТИВАЦИОННО -ПРИНУДИТЕЛЬНОГО СТИМУЛИРОВАНИЯ. *Teoria i praktika fiziceskoj kul'tury* (5), 102-104.

The study considers the high priority problem of the technical and tactical skills building in modern Greco-Roman wrestling. The study was performed at 'Vityaz' CYSS in Naberezhnye Chelny. Subject to the study were junior Greco-Roman wrestlers split up into Experimental and Reference Groups (EG, RG) of 26 people each. The Reference Groups was trained as required by the standard CYSS program; and the Experimental Groups were trained as required by the A.S. Kuznetsov's frame technical skills building program supported by a motivation and-compulsion system. The motivation-and-compulsion system of our own design implies integration of the sport qualification and technical requirements, with the sport and technical qualifications being combined. Benefits of the motivation-and-compulsion system were tested for 4 years by the following test criteria: technical skills versatility; activity rate; action success (quantitative) rate; action efficiency (qualitative) rate; and the scoring rate. It should be noted that the Experimental and Reference Groups were virtually the same in the compositions, physical and technical fitness rates prior to the experiment. After the first, second and third years of the model piloting experiment, the groups showed progress in every test rate, with the statistically meaningful intergroup differences. In the fourth year of the experiment, the groups still showed progress in every test rate, with the Experimental Group demonstrating meaningful advantages in the tests. Therefore, the motivation-and-compulsion system was found beneficial for the Greco-Roman wrestlers' education and training process as verified by the EG meaningful progress in the competitive technical skills versatility, technical and tactical fitness rates and the competitive success rates.

Bozic, P. R., & Bacvarevic, B. B. (2018). Force-Velocity Profiles of Elite Athletes Tested on a Cycle Ergometer. *Montenegrin Journal of Sports Science & Medicine*, 7(1), 59-66.

The present study explored the sensitivity of the force-velocity (F-V) modelling approach obtained from maximal sprints on a leg cycle ergometer to detect selective changes of the mechanical capacities of the lower body muscles associated with high-level training. Specifically, we assumed that the F-V relationship parameters, such as maximum force (F<sub>0</sub>), velocity (V<sub>0</sub>), power (PM) and slope, would differ among individuals of different high-level training backgrounds. In total, 111 elite athletes divided into four groups (Combat sports, Athletic sprints, Team sports and Physically active) performed maximal sprints on a leg cycle ergometer loaded with 7%, 9%, and 11% of body weight. The findings obtained suggest an exceptionally strong and linear F-V relationship in most of the participants ( $r > 0.95$ ), while higher PM have been found in all groups of athletes compared to the Physically active group ( $p < 0.05$ ). In addition, sport-specific F-V profiles have been observed in athletes that belong to distinctively different sports (i.e. higher F<sub>0</sub> and force-oriented slope for strength-trained Combat sports and higher V<sub>0</sub> for speed-trained Athletic sprints). To our knowledge, this is one of the rare studies that evaluate the F-V profiles with such a large sample of elite athletes obtained from commonly used task such as maximal sprints on a leg cycle ergometer. The results obtained support a high sensitivity of the F-V modelling approach to distinguish among elite athletes with different training histories.

Braun, T. I. M., & Kahanov, L. (2018). Community-associated Methicillin-Resistant *Staphylococcus aureus* Infection Rates and Management among Student-Athletes. *Medicine & Science in Sports & Exercise*, 50(9), 1802-1809.

Purpose: Although community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infections have reduced among inpatient populations, the incidence in athletics continues to range greatly dependent on the sport. Over the 2015 to 2016 and 2016 to 2017 school years, we assessed the annual CA-MRSA incidence, sport risk, referral practices, and management protocols or interventions among high school and intercollegiate athletics. Methods: This study targeted high school and intercollegiate athletic programs across the United States. For the 2015 to 2016 study, 269 athletic trainers completed a one-time questionnaire. In the 2016 to 2017 study, 217 athletic trainers reported data bimonthly during the academic year. Each questionnaire targeted demographic information, physician-confirmed CA-MRSA infection occurrence, and management of CA-MRSA infections and bacterial skin lesions. Results: The CA-MRSA infection incidence was 26.8 per 10,000 athletes (95% confidence interval [CI], 24–30) in 2015–2016 and 20.3 per 10,000 athletes (95% CI, 18–23) in 2016–2017. The CA-MRSA infection incidence was high in wrestling and football compared to the general student-athlete population. During the 2015 to 2016 study, the wrestling incidence rate was 248.3 per 10,000 (95% CI, 204–302); the football incidence rate was 71.0 per 10,000 (95% CI, 60–85). In the 2016 to 2017 study, the wrestling incidence rate was 100.0 per 10,000 (95% CI, 66–151); the football incidence rate was 81.8 per 10,000 (95% CI, 68–99). At least 23% of respondents denoted at least one physician-confirmed CA-MRSA infection within their populations (2015–2016, 39%, n = 105; 2016–2017, 23.5%, n = 51). In the 2015 to 2016 survey, respondents indicated that athlete education and environmental decontamination were the most used management steps (51.8%, n = 582).

Conclusions: Despite increased awareness of CA-MRSA, more educational efforts focusing on best practices and education are needed, especially with athletes and the medical community involved in their care.

Brito, C. J., Mozer, R. L., Montes Assis de Bem, E., Berbert de Carvalho, P. H., Carrenho Queiroz, A. C., dal Bello, F., . . . Miarka, B. (2018). Exploratory study on illegal pharmacologic agents in mixed martial arts performance. / Estudo exploratório sobre agentes farmacológicos ilegais no desempenho em artes marciais mistas. *Brazilian Journal of Kineanthropometry & Human Performance*, 20(3), 269-279.

Mixed Martial Arts (MMA) is a combat sport that requires maximum physical effort during competitions. In this context, some athletes can use illicit substances in order to improve their performance. By means of paired analysis, the present study compared the motor actions of athletes who had failed an anti-doping test versus their performance in combat against a winner or loser without doping presence. For this, 267 rounds (male and female) were analyzed in professional matches. The rounds were paired by athletes in the conditions: doping, winning and losing. Motor actions were analyzed through a specific and previously-validated protocol. Of the substances detected, anabolic androgenic steroids represented 55% ( $p \leq 0.001$ ). Doped athletes had lower pause time ( $83.4 \pm 68.3$  vs.  $131.7 \pm 95.2$ ,  $p \leq 0.001$ ) and longer time at high-intensity ( $85.2 \pm 86.6$  vs.  $51.2 \pm 73.3$ ,  $p = 0.002$ ) compared to the losing condition. Regarding the technical-tactical analysis in standing combat, winning presented a higher mean compared to doping in all variables except for Knockdowns ( $p = 0.08$ ), single body strikes landed ( $p = 0.15$ ), single leg strikes landed ( $p = 0.25$ ) and single strike attempts ( $p = 0.4$ ). In conclusion, athletes who tested positive presented higher performance in the physical variables (effort and pause time) in comparison to the losing condition; however, doping did not reflect in better technical-tactical performance.

Bulgay, C., & Cetin, E. (2018). Examination of Physical, Motor and Physiological Characteristics of Athletes and Wrestlers Between the Ages of 12 and 14 in Terms of Branching. *International Journal of Applied Exercise Physiology*, 7(1), 1-10. doi:10.22034/ijaep.v7i1.152

The purpose of the study is to compare the physical, motor and physiological characteristics of students between the ages of 12 and 14 who regularly perform athletics and wrestling sports with non-sports students, and explore their effect on the sports students' level of branching. The research group was selected among student at Kecioren Mecidiye Secondary School and Alaeddin Ozdenoren Imam Hatip Secondary School in Ankara. A total of 47 male students formed the research group 15 students between the ages of 12 and 14 who are engaged in regular athletics training, 17 students who regularly perform wrestling and 15 volunteers in the same age group who do not sports. Measurements included age, height, body weight, Agility (T-test), hand grip strength, standing jump, vertical jump, body fat percentage, flamingo balance, flexibility, 1 min shuttle, BMI, 30 m speed run, 1000 m run-walk tests. The analysis of the data was evaluated according to the results of the Levene test for homogeneity. If the result was homogeneous, ANOVA method was used. Otherwise Kruskal Wallis comparison test was performed. In variables whose averages differed as result of multiple comparisons, the TUKEY test was used to find which groups these differences stemmed from. The results of agility, right and left hand grip strength, flexibility, 1 min shuttle, Body Mass Index (BMI), 30 m speed, 1000 m run-walk tests were statistically significant. However, the results for height, weight, age, long jump, flamingo balance, body fat percentage, vertical jump tests were not statistically significant. When we look at the results, it is found that the best results for 1000 m run-walk, 30 m speed run, agility (T-test), height, long jump, vertical jump were recorded in the athletics group. It has been observed that the wrestler group has better results in body weight, body fat percentage, grasp strength, flamingo balance, 1 minute shuttle and flexibility parameters. The values of the control group were found to be lower than those who were engaged in athletics and wrestling as they did not exercise regularly. When the differences

between the groups are evaluated, it can be said that there is a tendency towards branching in a branch in students between the ages of 12 and 14.

Burke, L. M., Close, G. L., Lundy, B., Moores, M., Morton, J. P., & Tenforde, A. S. (2018). Relative Energy Deficiency in Sport in Male Athletes: A Commentary on Its Presentation Among Selected Groups of Male Athletes. *International Journal of Sport Nutrition & Exercise Metabolism*, 28(4), 364-374.

Low energy availability (LEA) is a key element of the Female Athlete Triad. Causes of LEA include failure to match high exercise energy expenditure (unintentional) or pathological behaviors of disordered eating (compulsive) and overzealous weight control programs (misguided but intentional). Recognition of such scenarios in male athletes contributed to the pronouncement of the more inclusive Relative Energy Deficiency in Sport (RED-S) syndrome. This commentary describes the insights and experience of the current group of authors around the apparently heightened risk of LEA in some populations of male athletes: road cyclists, rowers (lightweight and open weight), athletes in combat sports, distance runners, and jockeys. The frequency, duration, and magnitude of the LEA state appear to vary between populations. Common risk factors include cyclical management of challenging body mass and composition targets (including "making weight") and the high energy cost of some training programs or events that is not easily matched by energy intake. However, additional factors such as food insecurity and lack of finances may also contribute to impaired nutrition in some populations. Collectively, these insights substantiate the concept of RED-S in male athletes and suggest that a specific understanding of a sport, subpopulation, or culture may identify a complex series of factors that can contribute to LEA and the type and severity of its outcomes. This commentary provides a perspective on the range of risk factors that should be addressed in future surveys of RED-S in athletic populations and targeted for specific investigation and modification.

Cabistany, L., Coswig, V. S., Orcy, R. B., & Del Vecchio, F. B. (2018). Testosterone-mediated activation of androgenic signaling sustains in vitro the transformed and radioresistant phenotype of rhabdomyosarcoma cell lines. *Sport Sciences for Health*, 14(2), 433-438.

Objective: This study aimed to analyze the effects of Taekwondo match on blood and salivary lactate concentration, and their correlations, pre- and post-Taekwondo matches. Methods: For that eleven Taekwondo fighters (18 ± 3.6 years old, 59.18 ± 14.2 kg, 1.61 ± 0.1 cm, and 70.81 ± 97.4 months of practice) were enrolled. An experimental study with pre- and post-match measures was conducted where blood and salivary lactate were measured, as well as vertical height and rating of perceived exertion. For data analysis Student's t test, Pearson's coefficient and linear regressions were applied using SPSS software version 22.0 and statistical significance was set in 5%. Results: Blood and salivary lactate measures changed significantly from PRE to POST (p = 0.001 and p = 0.04, respectively) with large and moderate effects, respectively. Correlations between lactate measures did not show significance (r = 0.35; p = 0.39). Otherwise, POST values showed moderate significant correlations (r = 0.61; p = 0.04). Additionally, linear regressions indicated that POST blood lactate concentrations can explain only 37.8% of POST salivary lactate concentrations (p = 0.04). Conclusion: To conclude, blood and salivary lactate responses do not present similar responses for TKD athletes after combat simulation.

Calvo Rico, B., Fernandes Monteiro, L., Aznar Laín, S., & García, J. M. (2018). Comparison of body composition variations between hydrated and dehydrated judokas and wrestler / Comparación de las variaciones de la composición corporal entre judokas y luchadores hidratados Vs deshidratados. *Retos: Nuevas Perspectivas de Educación Física, Deporte y Recreación* (33), 10-13.

The aim of this study was to determine how body composition parameters are modified in judo and wrestling. Both disciplines are organized by weight categories, this regularly leading to eating disorders and continuous dehydration in order to reach the needed competition weight. Also, this paper aims to understand whether there exist differences in this practice by gender and by sports discipline. A Biospace Inbody 230 system (CA, USA) was employed on a sample of 64 national elite judo and wrestling athletes from Spain and Portugal. Statistical analysis was performed using Kolmogorov-Smirnov and student t tests, which analyze mean differences. The findings and conclusions of the study showed a higher number of dehydrated athletes than those in optimal values of hydration during the pre-competitive period. This condition pushes athletes' body to constant efforts and changes, possibly determining a detrimental effect on their short- and long-term performance, both in training and competitions.

Campideli, T. S., Ferreira, R. M., Coelho, E. F., Werneck, F. Z., Penna, E. M., & Panza, P. S. (2018). Relative age effect in Olympic combat sports athletes / Efeito da idade relativa em atletas olímpicos de esportes de combate. *Motricidade*, 14(1S), 279-286.

Relative age effect (RAE) refers to the consequences of the chronological age difference between individuals who are grouped in the same age category. The objective was to investigate the presence of RAE in Olympic combat sports athletes. The birth date of 1,163 boxing, judo, wrestling and taekwondo athletes competing at 2012 Olympic Games and 1,148 athletes at 2016 Olympic Games was examined. The RAE was examined for the distribution of quartiles and births of athletes from each modality, by sex and edition of the Olympic Games,



through the Chi-Square test ( $X^2$ ), adopting significance level of 5%. It was verified the existence of the RAE in female judo, with a higher representation of athletes born in the first semester ( $X^2 = 7.503$ ;  $p = 0.01$ ). On the other hand, there was an inverse RAE in women's boxing, with a higher representation of athletes born in the second semester ( $X^2 = 3.959$ ;  $p = 0.05$ ) and in male taekwondo in 2016, in which there was a greater representation of athletes born in the 3rd quartile ( $X^2 = 8.292$ ;  $p = 0.04$ ). It is concluded that the RAE is not consistently found in Olympic combat sports athletes, varying according to sex, modality and edition of the Olympic Games, and an inverse RAE can still be observed.

Can, I., Cihan, H., Ari, E., & Bayrakdaroglu, S. (2018). Comparison of the velocity and power parameters during loaded-squat jump exercise of national athletes in different branches. *Journal of Education and Training Studies*, 6(5), 16-20.

The aim of this investigation is to compare velocity and power variables during loaded-squat jump ( $SJ_{Loaded}$ ) exercise of national athletes dealing with different sports branches and to identify whether velocity and power parameters become different or not according to branches. In accordance with this purpose, a total of 36 national athletes (age:  $20.3 \pm 1.68$  years; height:  $173.5 \pm 6.46$  cm; weight:  $72.3 \pm 10.29$  kg) composed of 12 wrestlers (age:  $19.5 \pm 0.90$  years; height:  $172.3 \pm 6.19$  cm; weight:  $75.5 \pm 13.9$  kg), 12 arm wrestlers (age:  $20.5 \pm 2.02$  years; height:  $174.7 \pm 4.76$  cm; weight:  $72.6 \pm 8.31$  kg) and 12 kickboxers (age:  $20.7 \pm 1.81$  years; height:  $173.5 \pm 8.29$  cm; weight:  $68.9 \pm 6.94$  kg) dealing with different sports branches have voluntarily participated in this study. For identifying velocity and power parameters,  $SJ_{Loaded}$  exercise was executed with an external load that corresponds to 40% of body weights of the athletes by utilizing an isoinertial velocity transducer (T-Force dynamic measurement system) and values of mean velocity (MV), mean propulsive velocity (MPV), peak velocity (PV), mean power (MP), mean propulsive power (MPP) and peak power (PP) were determined. All data analyzes were performed in the SPSS 16.0 statistical program. Firstly, in order to analyze data, it was determined that the data indicated normal distribution by looking at the Shapiro-Wilk coefficient regarding the normality of the distribution of the data. Therefore, one-way analysis of variance (One-way ANOVA) was utilized to identify statistically significant differences among athletes competing in different branches with regard to the velocity and power variables during the  $SJ_{Loaded}$  exercise. According to analyze results, no statistically significant difference wasn't seen among branches with regard to MV [ $f(2,33) = 1.306$ ], MPV [ $f(2,33) = 2.195$ ], PV [ $f(2,33) = 2.242$ ], MP [ $f(2,33) = 1.225$ ], MPP [ $f(2,33) = 2.787$ ] and PP [ $f(2,33) = 2.607$ ] parameters during  $SJ_{Loaded}$  exercise ( $p > 0.05$ ). The velocity and power parameters obtained in the  $SJ_{Loaded}$  exercise don't differ according to the branches.

Caravaca, V., Hernandez-Garcia, R., & Garcia-De-Alcaraz, A. (2018). Bibliometric analysis of the scientific production of judo as a combat sport. / Análisis bibliométrico de la producción científica sobre judo como deporte de combate. *Revista de Artes Marciales Asiáticas*, 13, 9-12. doi:10.18002/rama.v13i2s.5497

The aim of this paper was to analyze the trends in judo research as a combat sport through a bibliometric analysis of scientific production indexed in the Web of Science database, starting with a group of 336 articles published between 2007 and 2017. By applying the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA-P) methodology, the study sample was reduced to 88 articles. Different types of variables were analyzed: a) institutional characteristics; b) sample-related characteristics; and c) research methods and tools. The results showed that the most productive years were 2014 and 2016, when the average number of authors was  $4.56 \pm 1.79$  and the average number of citations in the Web of Science was  $9.25 \pm 11.9$ . The highest percentage of publications showed male samples, of high-performance level and under the discipline of training theory. The most commonly methodology used was the observational study with univariate statistics through instruments and observation tools. The most studied parameters were physiological and technical-tactical elements. It seems that judo as a combat sport attracts more scientific interest in its sporting side to achieve a more specific analysis of the sport of judo, without con and competitive side. Some suggestions are apropos textualizing it as a combat sport.

Cejudo Palomo, A., San Cirilo Soriano, B., Robles Palazon, F. J., & del Pilar Saiz De Baranda, M. (2018). Analysis of the flexibility profile in young taekwondo athletes / Análisis del perfil de flexibilidad en jóvenes taekwondistas. . *Revista de Artes Marciales Asiáticas*, 13, 30-33.

The main aim of this study was to determine the flexibility profile of the lower extremity in young taekwondo athletes, as well as identifying athletes with muscle shortness. For this purpose, a total of 17 young taekwondo athletes were assessed; seven from the Spanish team and ten from the Murcia team. The range of motion of the main movements of the lower extremity was evaluated by the "ROM SPORT" protocol and a descriptive analysis of each of the quantitative variables was performed. A Student t-test or a Wilcoxon test was applied depending on the normality distribution of the data. The ROM values of each movement were classified as "normal" or "shortness" according to previously determined reference values. The results define the following flexibility profile:  $23^\circ$  for iliopsoas,  $28^\circ$  for piriformis,  $37^\circ$  for gastrocnemius,  $42^\circ$  for soleus,  $46^\circ$  for adductors,  $46^\circ$  for external rotators,  $56^\circ$  for internal rotators,  $77^\circ$  for monoarticular adductors,  $80^\circ$  for hamstrings,  $140^\circ$  for quadriceps and  $145^\circ$  for gluteus maximus. Individual evaluations identified muscle shortness in pyramidal (11 athletes, 64.7%),

soleus (13 athletes, 76.4%), external rotators (8 athletes, 47%), monoarticular adductors (14 athletes, 82.3%), hamstrings (13 athletes, 76.4%), quadriceps (4 athletes, 23.5%) and gluteus maximus (12 athletes, 70.5%). This flexibility profile can help sports professionals to set quantifiable goals for the training of flexibility in this sport. The inclusion of stretching exercises or the increase of their doses should be applied for the improvement of the identified shortness in piriformis, soleus, external hip rotators, monoarticular, hamstring, and gluteus maximus adductors.

Ceylan, B., Gurses, V. V., Akgul, M. S., Baydil, B., & Franchini, E. (2018). Anthropometric Profile, Wingate Performance and Special Judo Fitness Levels of Turkish Olympic Judo Athletes. / Profil antropometryczny, test wydolności (Wingate) i specjalny test sprawdzający poziom umiejętności judo tureckich olimpijczyków. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 18(3), 15-20.

Background. Judo is an Olympic sport where physical fitness is of great importance as well as technique and tactics. Physical and physiological conditions of the athletes are very important for a better judo performance and there is still a need for more data related to these determinants. Problem and aim. There is a need for more data concerning anthropological determinants of judo athletes. Thus, the aim of this study was to evaluate anthropometric profile, Wingate and Special Judo Fitness Test (SJFT) performance. Methods. The following tests and measurements were conducted in order to investigate anthropometric profile, Wingate and Special Judo Fitness Test (SJFT) performance of male (n=7) and female (n=10) judo athletes from Turkish Olympic judo team: anthropometric measurements, Wingate anaerobic test (WanT) and SJFT. An independent Student t test was used to compare male and female athletes. Pearson product correlation was used to verify the relationship between variables. Effect sizes were calculated following the recommendations by Rhea (2004). Results. There were differences between male and female athletes in the following variables; fat-free mass, body fat percentage, peak and mean power, HR after the set A and in the SJFT index ( $p < 0.05$ ). Large, and very large correlations were found between anthropometric measurements, SJFT parameters and WanT performance results ( $p < 0.01$ ). Large correlation was found between fat-free mass and HR values during SJFT sets ( $p < 0.05$ ). Conclusions. It can be concluded that the higher the fat percentage, the lower is the performance in activities involving body displacement. In conclusion, sex and weight differences should be taken into consideration while evaluating judo athletes and because higher fat-free mass means better SJFT performance, the training program should be organized to decrease or maintain body fat and increase muscle mass.

Chaabene, H., Negra, Y., Bouguezzi, R., Capranica, L., Franchini, E., Prieske, O., . . . Granacher, U. (2018). Tests for the Assessment of Sport-Specific Performance in Olympic Combat Sports: A Systematic Review with Practical Recommendations. *Frontiers in Physiology*, 9, 18. doi:10.3389/fphys.2018.00386

The regular monitoring of physical fitness and sport-specific performance is important in elite sports to increase the likelihood of success in competition. This study aimed to systematically review and to critically appraise the methodological quality, validation data, and feasibility of the sport-specific performance assessment in Olympic combat sports like amateur boxing, fencing, judo, karate, taekwondo, and wrestling. A systematic search was conducted in the electronic databases PubMed, Google-Scholar, and Science-Direct up to October 2017. Studies in combat sports were included that reported validation data (e.g., reliability, validity, sensitivity) of sport-specific tests. Overall, 39 studies were eligible for inclusion in this review. The majority of studies (74%) contained sample sizes  $< 30$  subjects. Nearly, 1/3 of the reviewed studies lacked a sufficient description (e.g., anthropometrics, age, expertise level) of the included participants. Seventy-two percent of studies did not sufficiently report inclusion/exclusion criteria of their participants. In 62% of the included studies, the description and/or inclusion of a familiarization session (s) was either incomplete or not existent. Sixty-percent of studies did not report any details about the stability of testing conditions. Approximately half of the studies examined reliability measures of the included sport-specific tests (intraclass correlation coefficient [ICC] = 0.43-1.00). Content validity was addressed in all included studies, criterion validity (only the concurrent aspect of it) in approximately half of the studies with correlation coefficients ranging from  $r = -0.41$  to 0.90. Construct validity was reported in 31% of the included studies and predictive validity in only one. Test sensitivity was addressed in 13% of the included studies. The majority of studies (64%) ignored and/or provided incomplete information on test feasibility and methodological limitations of the sport-specific test. In 28% of the included studies, insufficient information or a complete lack of information was provided in the respective field of the test application. Several methodological gaps exist in studies that used sport-specific performance tests in Olympic combat sports. Additional research should adopt more rigorous validation procedures in the application and description of sport-specific performance tests in Olympic combat sports.

Challis, J. H. (2018). Body Size and Movement. *Kinesiology Review*, 7(1), 88-93.

Humans of different sizes move in very similar ways despite the size difference. The principles of geometric scaling provide insight into the reasons for the similar movement patterns observed. In human locomotion, body size influences endurance running performance, with shorter body sizes being an advantage due to better heat exchange compared with their taller counterparts. Scaling can also show the equivalence of child gait with that of adults in terms of stride length and walking velocity. In humans, maximum jump height is independent of standing

height, a scaling result which has been validated by examining jumps with mass added to the body. Finally, strength scales in proportion to body mass to the two-thirds power, which explains why shorter people have greater relative body strength compared with taller individuals. Geometric scaling reveals the underlying principles of many human movement forms.

- Chernozub, A., Korobeynikov, G., Mytskan, B., Korobeinikova, L., & Cynarski, W. J. (2018). Modelling Mixed Martial Arts Power Training Needs Depending on the Predominance of the Strike or Wrestling Fighting Style. / Opracowanie treningu siłowego w mieszanych sztukach walki w zależności od stylu walki z przewagą uderzania lub chwytania/zapasów. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 18(3), 28-36.  
Purpose - to develop models for Mixed Martial Arts athletes power training, depending on the predominance of the strike or the wrestling style in fighting, and also to determine the impact of the proposed training loads on increasing the functional ability of their bodies. Methods. We examined 30 athletes aged 20-22 who were involved in Mixed Martial Arts fights over the last 2 years. Half the fighters use the strike style in the course of combat, and the rest specialise in the wrestling style. To assess the effectiveness of the occupation models we developed, we used the control testing method of the level of power capabilities development. With the help of the biochemical control of cortisol concentrations in the blood serum of the fighters, we determined the manifestation of adaptive-compensatory reactions of the body to various power loads. Results. It was established that the optimal power loads for fighters using the strike style of fighting was to use a high-intensity regime when working with an alactate or lactate energy supply system. In turn, the most effective power loads, for the maximum realisation of functional potential in athletes prioritising the wrestling style during the fight, was the use of low-intensity regimes with a large amount of work in the glycolytic power supply system. Conclusions. The analysis of the results obtained during the experiment demonstrates the need for using models of training sessions developed in the process of power training of MMA fighters, taking into account the particular fighting style. ABSTRACT FROM AUTHOR
- Courel-Ibanez, J., Franchini, E., & Escobar-Molina, R. (2018). Is the Special Judo Fitness Test Index discriminative during formative stages? Age and competitive level differences in U13 and U15 children. / Czy Indeks Indywidualnych Testów Sprawnościowych Judo jest różnicujący na etapach kształtowania osobowości? Różnice ze względu na wiek i poziom zaawansowania w kategoriach wiekowych do 13 i do 15 lat. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 18(3), 37-41.  
Aim. The aim of the present study was to perform SJFT in children to analyse differences between groups of age and competition level. Methods. Thirty-four male children judo athletes aged under 13 (U13) and under 15 (U15) years-old were recruited from a local gym (amateurs) and the Spanish National Judo Team (SNT) and classified in three groups: U13 amateur, U15 amateur and U15 SNT. Children performed the SJFT in similar height and weight pairs. Age comparisons revealed no difference in SJFT index given the lower number of throws during the SJFT for U13 children (95% CI<sub>high</sub> = <23 vs. >22 and >23 throws) but the faster heart rate (HR) recovery (95% CI<sub>high</sub> = < 150 vs. >150 and >147 bpm) compared to the U15 amateur and SNT groups. Results. Competitive level comparisons between U15 amateur and SNT revealed no difference in SJFT performance (throws, HR and index). Thus, the SJFT index is not a proper variable to detect differences between groups at these ages. Conclusions. These findings open the challenge to design appropriate conditioning test for children during formative years to better measure performance and develop adequate training and teaching plans.
- De La Fuente, A. (2018). Height categories as a healthier alternative to weight categories in taekwondo competition. / Categorías por altura como alternativa más saludable a las categorías de peso para la competición de taekwondo. *Revista de Artes Marciales Asiáticas*, 13(1), 53-60.  
Weight division is the most common way of categorizing athletes for competition in martial arts and combat sports. Eating disorders and the use of rapid weight loss methods are common among combat sports athletes, both at young and adult ages at all competition levels. Meanwhile, height is commonly regarded as determinant in kicking combat sports. The present study aimed to examine whether height categories can be used as a healthier alternative to weight categories for official competition. The height and weight of 153 male (n=80) and female (n=73) competitive taekwondo athletes aged between 10 and 16 were measured. Participants were classified by age, sex, and official weight category. Athletes were then sorted into ten hypothetical numbered height categories established in every age and sex group, according to World Health Organization (WHO) percentiles. There was a strong correlation between height and weight (r=0.843, p<0.01), and between height and weight categorization (r=0.681, p<0.01), and 68.18% of participants stayed the same, or moved only ±1 category by height from their original weight category. We conclude that young competitive taekwondo athletes can be classified by stature for official competitions, as a healthier and more equitable alternative to current weight categories.
- de Oliveira Vilar Neto, J., da Silva, C. A., Barroso Lima, A., Rosa de Souza, F. J., Vieira Pinto, D., de Sousa Araujo, J., . . . de Francesco Daher, E. (2018). Effects of Low-Dose Creatine Monohydrate on Muscle Strength and Endurance. *Asian Journal of Sports Medicine*, 9(3), 1-8.  
To investigate the effect of low-dose supplementation of creatine monohydrate without the use of the saturation phase, 36 male university students engaged in resistance training (age 22.5 ± 4.3 years, height 1.76 ± 0.08 m,

weight  $77.0 \pm 11.0$  kg, and body mass index  $24.6 \pm 2.5$  kg/m<sup>2</sup>) were randomly divided into three groups: group placebo (GP), group supplemented with creatine 3 g/day (3G), and group supplemented with 5 g/day creatine (5G). The subjects were tested for maximum muscle strength (1RM), upper body muscle endurance (MPU), and abdominal muscle endurance (MSU) before and after 7, 14, 21, 28, and 35 days of creatine supplementation or placebo and performing standardized resistance training. After 35 days of supplementation and training, all groups showed a significant improvement in the 1RM test; however, the percentages of strength increase were significantly higher ( $P < 0.05$ ) in the groups supplemented with creatine (G3,  $\Delta\%$  1RM =  $20.0 \pm 4.0$ ; G5,  $\Delta\%$  1RM =  $19.9 \pm 1.5$ ) than in the placebo group (GP,  $\Delta\%$  1RM =  $10.3 \pm 1.9$ ). Upper limb muscle endurance showed a significant improvement only in 5G, ranging from  $39.9 \pm 7.9$  MPU/min to  $50.7 \pm 11.0$  MPU/min after 35 days of supplementation. Interestingly, abdominal muscle endurance showed no increase in any of the groups (GP,  $P > 0.528$ ; G3,  $P > 0.076$ ; G5,  $P > 0.148$ ). These results support a number of earlier studies that demonstrated that creatine supplementation at low doses and without the use of the loading phase are effective for increasing maximal strength and endurance of upper limbs.

Del Vecchio, F. B., Farias, C. B., de Leon, R. C., Rocha, A. C. C. A., Galliano, L. M., & Coswig, V. S. (2018). Injuries in martial arts and combat sports: Prevalence, characteristics and mechanisms. *Science & Sports*, 33(3), 158-163. Summary Objective To measure sports injuries prevalence, types and mechanisms, considering grappling and impact modalities. Equipment and methods An observational, descriptive epidemiology study was conducted involving 125 recreational practitioners. Subjects were inquired regarding the type of martial arts and combat sports (MACS), age, practice time and weekly training volume. Results From all, 53.6% athletes suffered injury in the last 12 months. The most common were tendon injuries (39%) and sprains (39%), followed by dislocation/subluxation (23%). In grappling MACS, as Judo, joints injuries were the most frequent, especially the knees and shoulders. For striking modalities, such as Karate, muscle injuries were more frequent and the most common sites were feet and toes, followed by hands and fingers. The lower limbs were the most affected site ( $\chi^2 = 67.8$ ,  $P < 0.001$ ). A higher prevalence of injury was found in combat simulations (43%) than in technical training (26%) and competition (10%). Conclusion There was a high percentage of injury in lower limbs for both modality groups, and the higher frequency of injuries in the upper limbs were the shoulders, hands and fingers, while for lower limbs were the feet and toes, ankles and knees. Injury occurred mainly during technical training and, in most cases, without protective equipment.

Demirel, N., Özbay, S., & Kaya, F. (2018). The Effects of Aerobic and Anaerobic Training Programs Applied to Elite Wrestlers on Body Mass Index (BMI) and Blood Lipids. *Journal of Education and Training Studies*, 6(4), 58-62. The purpose of this study is to analyse the effects of aerobic and anaerobic training programs applied to elite wrestlers on body mass index (BMI) and blood lipids. 20 elite wrestlers, whose average age is (experimental group;  $15.20 \pm 4.61$ ,  $n = 10$ ), control group;  $15.90 \pm 2.08$ ,  $n = 10$ ), participated in the study and they were randomly divided into two groups. Strength and endurance training programme based on "one day aerobic, one day anaerobic" principles was applied to the experimental group six days a week for eight weeks. The control group went on doing normal routine wrestling technical training. Before and after eight-week training program, BMI, Triglyceride, HDL-C, VLDL, Cholesterol, LDL blood values were taken from the experimental and the control group by body analyser. According to the results of the study, none of the blood lipid indicators of the control group were significantly changed from pretest to posttest. ( $p > 0.05$ ). However, HDL-C, cholesterol and LDL values from blood lipids indicators of the experimental group changed significantly from pretest to posttest. ( $p < 0.05$ ). There were no significant changes in body mass index (BMI), Triglyceride and VLDL. As a result, this study revealed that there was no significant difference in the control group which did exercise routinely, while the training programme with changeable type and volume made significant differences in the experimental group. In the statistical analyses, paired- samples t test was used for intra-group comparisons, and independent sample t test was used for inter-group comparisons. The significance level was determined as  $p < 0.05$ . For all the values, mean and standard deviation were used.

Demirhan, B., Canuzakov, K., Abdurrahmanova, C., Gunay, M., Bolzhirova, E. (2018). Seasonal evaluation of regional strength of athletes of national team of Kyrgyzstan from different branches of sport before 2016 summer Olympic games. *Ovidius University Annals, Series Physical Education & Sport/Science, Movement & Health*, 18, 290-294. Objective. In this work, the changes in the regional strengths during the seasonal training period of 38 athletes prepared to qualification before 2016 Summer Olympic Games were analyzed. The research was conducted on 35 male and 3 female national athletes including 9 male Greco-Roman wrestlers ( $24 \pm 4.5$  years), 10 male Freestyle wrestling athletes ( $22.10 \pm 3.21$  years), 8 male judokas ( $23.6 \pm 1.89$  years), 8 male athletes ( $22.29 \pm 2.87$  years), and 3 female athletes ( $21.67 \pm 2.08$  years) Methods. The regional strength of the participating athletes was measured 3 times in total, immediately before the 6-month training period, 3 months later and 6 months later. Measurement of Hand Grip Strength (HGS) of athletes was assessed using the Takei brand Hand dynamometer and back and leg strength was measured by the Takei back-lift Dynamometer. To determine the difference between the measurements, the test "Analysis of variance in repeated measurements" was used. Differences in  $P < 0.05$  were considered significant. Results. Study revealed that, judokas', Greco- Roman and freestyle wrestlers'

back and leg strength were significantly higher ( $P < 0.05$ ) on the 6th month compared to baseline and 3 month later measurements. Left and right grip strength did not reflect any statistical differences according to time measurement in all branches of Sport ( $P > 0.05$ ). The strength values of female athletes showed no statistical difference between the measurements ( $P > 0.05$ ). Conclusions. Strength training, which wrestlers, judokas and male athletes were engaged in during the preparatory period, led to an increase in the value of the back and leg strength, as they approached the period of the competition. However, it was observed that, even the features of strength that is important for wrestling athletes are increased, in general, this increase is lower than expected for Olympic athletes. For this reason, it was concluded that the athletes have to carry out more planned studies to gain strength during the preparation period.

Den Hartigh, R. J. R., Niessen, A. S. M., Frencken, W. G. P., & Meijer, R. R. (2018). Selection procedures in sports: Improving predictions of athletes' future performance. *European journal of sport science*, 1-8. doi:10.1080/17461391.2018.1480662

The selection of athletes has been a central topic in sports sciences for decades. Yet, little consideration has been given to the theoretical underpinnings and predictive validity of the procedures. In this paper, we evaluate current selection procedures in sports given what we know from the selection psychology literature. We contrast the popular clinical method (predictions based on overall impressions of experts) with the actuarial approach (predictions based on pre-defined decision rules), and we discuss why the latter approach often leads to superior performance predictions. Furthermore, we discuss the "signs" and the "samples" approaches. Taking the prevailing signs approach, athletes' technical-, tactical-, physical-, and psychological skills are often assessed separately in controlled settings. However, for predicting later sport performance, taking samples of athletes' behaviours in their sports environment may result in more valid assessments. We discuss the possible advantages and implications of making selection procedures in sports more actuarial and sample-based.

do Nascimento-Carvalho, B., Mayta, M. A. C., Izaias, J. E., Doro, M. R., Scapini, K., Caperuto, E., . . . Sanches, I. C. (2018). Cardiac sympathetic modulation increases after weight loss in combat sports athletes. / aumento de la modulación cardíaca simpática después de la pérdida ponderal en atletas de combate. *Revista Brasileira De Medicina Do Esporte*, 24(6), 413-417.

Introduction: Although the rapid weight loss process is undertaken by combat sports athletes very often, the impact of this practice on cardiovascular health is not fully understood. Objective: To verify the effects of the rapid weight loss process undertaken by combat sports athletes on hemodynamic parameters, cardiovascular autonomic modulation and mood state. Methods: Eight male fighters ( $21.62 \pm 1.49$  years,  $71.25 \pm 3.54$  kg,  $1.74 \pm 0.03$  cm) were assessed in the city of São Paulo. The subjects had  $5.37 \pm 0.77$  years of practice and were training  $5.75 \pm 0.45$  days per week, for  $3.05 \pm 0.69$  hours per day. The athletes were assessed on 2 occasions: 14 days before and 1 day before official weigh-in. Weight, height and bioimpedance were used for body composition analysis. Mood state was assessed using the Brums Mood Scale. Blood pressure was measured at rest with a digital meter. Cardiovascular autonomic modulation was obtained through an analysis of heart rate variability recorded for 25 minutes at rest. The Student's t-test for dependent samples was used for comparison between time points. Values of  $p < 0.05$  were considered significant. Results: No differences in body composition were observed between the time points evaluated. After the weight loss strategy, increases in mood state parameters related to anger, vigor and fatigue categories were observed. Blood pressure did not change between the time points evaluated. However, an increase in heart rate associated with greater sympathetic modulation was observed after the weight loss strategy. There were no differences in autonomic modulation parameters representing parasympathetic activity. Conclusions: The study provided evidence of a higher cardiovascular risk in athletes as a result of this rapid weight loss practice, which is very concerning since combat sports athletes repeat this process several times during their lives.

Dokmanac, M., & Slaćanec, K. (2018). Analysis of the Most Important Parameters in Wrestling Matches from the Senior World Championship 2017, the Senior European Championship 2018 and the World Championship 2018. *International Journal of Wrestling Science*, 8(2), 18-29.

This analysis is based on the three the most important wrestling competitions in Greco-Roman Style in 2017 and 2018, the Senior World Championship (2017), the Senior European Championship (2018) and Senior World Championship (2018).

Durkalec-Michalski, K., Zawieja, E. E., Podgorski, T., Zawieja, B. E., Michalowska, P., Loniewski, I., & Jeszka, J. (2018). The Effect of a New Sodium Bicarbonate Loading Regimen on Anaerobic Capacity and Wrestling Performance. *Nutrients*, 10(6), 16. doi:10.3390/nu10060697

Gastrointestinal side effects are the main problem with sodium bicarbonate (SB) use in sports. Therefore, our study assessed the effect of a new SB loading regimen on anaerobic capacity and wrestling performance. Fifty-eight wrestlers were randomized to either a progressive-dose regimen of up to  $100 \text{ mg} \cdot \text{kg}^{-1}$  of SB or a placebo for 10 days. Before and after treatment, athletes completed an exercise protocol that comprised, in sequence, the first Wingate, dummy throw, and second Wingate tests. Blood samples were taken pre- and post-exercise. No gastrointestinal side effects were reported during the study. After SB treatment, there were no significant

improvements in the outcomes of the Wingate and dummy throw tests. The only index that significantly improved with SB, compared to the placebo ( $p = 0.0142$ ), was the time-to-peak power in the second Wingate test, which decreased from  $3.44 \pm 1.98$  to  $2.35 \pm 1.17$  s. There were also no differences in blood lactate or glucose concentrations. In conclusion, although the new loading regimen eliminated gastrointestinal symptoms, the doses could have been too small to elicit additional improvements in anaerobic power and wrestling performance. However, shortening the time-to-peak power during fatigue may be particularly valuable and is one of the variables contributing to the final success of a combat sports athlete.

- Elliott-Sale, K. J., Tenforde, A. S., Parziale, A. L., Holtzman, B., & Ackerman, K. E. (2018). Endocrine Effects of Relative Energy Deficiency in Sport. *International Journal of Sport Nutrition & Exercise Metabolism*, 28(4), 335-349. The term Relative Energy Deficiency in Sport was introduced by the International Olympic Committee in 2014. It refers to the potential health and performance consequences of inadequate energy for sport, emphasizing that there are consequences of low energy availability (EA; typically defined as  $<30 \text{ kcal}\cdot\text{kg}^{-1} \text{ fat-free mass}\cdot\text{day}^{-1}$ ) beyond the important and well-established female athlete triad, and that low EA affects populations other than women. As the prevalence and consequences of Relative Energy Deficiency in Sport become more apparent, it is important to understand the current knowledge of the hormonal changes that occur with decreased EA. This paper highlights endocrine changes that have been observed in female and male athletes with low EA. Where studies are not available in athletes, results of studies in low EA states, such as anorexia nervosa, are included. Dietary intake/appetite-regulating hormones, insulin and other glucose-regulating hormones, growth hormone and insulin-like growth factor 1, thyroid hormones, cortisol, and gonadal hormones are all discussed. The effects of low EA on body composition, metabolic rate, and bone in female and male athletes are presented, and we identify future directions to address knowledge gaps specific to athletes.
- Fabrikant, J. D. (2018). The Discriminatory Impact of Title IX through Its Implementation in U.S. College Athletics. *International Journal of Sport & Society: Annual Review*, 9(3), 53-72.
- Farahbakhsh, F., Akbari-Fakhrabadi, M., Shariat, A., Cleland, J. A., Farahbakhsh, F., Seif-Barghi, T., . . . Kordi, R. (2018). Neck pain and low back pain in relation to functional disability in different sport activities. *Journal of Exercise Rehabilitation*, 14(3), 509-515. doi:10.12965/jer.1836220.110 This population-based, cross-sectional study aimed to determine the frequency of neck pain, low back pain (LBP) and also the LBP related functional disability in five sport categories including football, volleyball, basketball, wrestling, and other sports in one of the Iranian sport Olympiads. The prevalence of neck pain and LBP in different time points was evaluated with the use of an interview questionnaire. A visual analogue scale was used to evaluate the athlete's current pain. Furthermore, the functional disability related to LBP was assessed by the Athletes Disability Index Questionnaire (ADI). A total of 452 male athletes aging between 12 and 20 were screened. Three hundred seventy-seven participants responded to the questionnaires in which their mean age (standard deviation) was  $15.95 \pm 1.25$ . Collectively, the life-time prevalence of neck pain and LBP in all the athletes was 38.8% and 42.0%, respectively. The highest risk of neck pain at all-time points was observed among basketball players compared to other sport groups ( $P < 0.05$ ). The risk of LBP in most time points was the least among wrestlers ( $P < 0.05$ ). The ADI score was significantly higher among basketball players (13.89%) compared to volleyball players and wrestlers ( $P < 0.05$ ). Our study revealed a high prevalence of neck pain and LBP among Iranian young male athletes. A higher risk of neck pain and LBP among basketball players predisposes this sport at high risk of developing spine injuries which needs further consideration.
- Flatt, R. E., & Taylor, C. B. (2018). Adapting a Technology-Based Eating Disorder Model for Athletes. *Journal of Clinical Sport Psychology*, 12(4), 699-717. Eating disorders (EDs) are common amongst athletes, yet few receive treatment. Given that athletes have a unique set of risk factors for eating disorders and are faced with additional barriers to treatment, new models outside of face-to-face treatment are necessary to reach the population and provide more affordable, tailored, evidence-based care. One solution is to use digital mental health programs to provide primary or supplemental therapy. Digital programs can provide accessibility and privacy, and recent advancements allow for more personalized online experiences. However, there have been no studies to date that integrate technology-based tools to address the especially high prevalence rates of EDs in athletes. This paper describes how an integrated model that includes online screening linked to guided self-help programs, all adapted specifically for athletes, can be used to provide prevention and intervention of EDs in athletes.
- Franchini, E., Gutierrez-Garcia, C., & Izquierdo, E. (2018). Olympic combat sports research output in the Web of Science: a sport sciences centered analysis. / Wyniki badań dotyczące olimpijskich sportów walki opublikowane na platformie Web of Science: analiza obejmująca nauki przyrodnicze. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 18(3), 21-27. Background and aim. The Olympic Games are the world's most important sport competition, and Sport Sciences have been regarded to play an important role for sport success at the Olympics. The combat sports of boxing,

fencing, judo, taekwondo and wrestling represent 20-25% of all medals disputed in this competition, and karate will be included Tokyo Olympic Games in 2020. In this context, this study aimed at describing the scenario of scientific research on Olympic combat sports in the Sport Sciences field. Methodology. Data search was performed in the area of Sport Sciences of the Web of Science core collection database. The variables selected for analysis were total number of publications, h-index, citations analyses and top ten types of documents, countries, research institutions, languages and journals. Results. A total of 2,752 publications were retrieved, achieving an h-index of 74, 34,255 citations and an average of 12.45 citations per item. The research was mainly published in English (95.35%), in article form (75.14%) and in the United States of America (27.87%), while the University of Sao Paulo (4.69%) and Medicine and Science in Sports and Exercise (11.56%) were respectively the institution and the source leading their top ten lists. Conclusion. Combat sports literature indexed in the Web of Science database amounted to nearly 1% of the Sport Sciences research area, showing that this field of study is still starting to consolidate. The connection between sport practice and research, the indexation of more combat sports journals, and the increase in the number and collaborations among researchers are suggested as potential ways to strengthen combat sports research.

Franchini, E., Lira, F. S., Julio, U. F., Antunes, B. M., Agostinho, M. F., Shiroma, S. A., & Gonçalves Panissa, V. L. (2018). Cytokine, physiological, technical-tactical and time structure responses in simulated judo competition. *International Journal of Performance Analysis in Sport*, 18(4), 595-608.

This study investigated physiological modulation on metabolic and inflammatory parameters, the technical-tactical and time structure variables, across a simulated judo competition. Ten judokas were submitted to a simulated competition (four matches), with blood collection in time zero, after each match, and 30 and 60 min post the fourth match. Before each match the rating of perceived recovery (RPR) and after each match the rating of perceived exertion (RPE) and heart rate (HR) were collected; lactate concentration before and after each match was collected. There was no difference across matches for RPR, RPE, HR, technical-tactical, time structure, interleukin (IL)-10, MCP-1, TNF- $\alpha$ , cortisol, testosterone and testosterone-cortisol ratio. Higher lactate was found post-match compared to prematch. Moreover, lactate was higher pre-third than the pre-first match, and post-second than post-third and fourth matches. Glucose was higher post-second match compared to prematches and 30-min post-fourth match; IL-6 was higher post-third, post-fourth and post-30 and 60-min fourth match than prematches and also higher post-first match compared to post-third and 60-min post-fourth match. Thus, alterations observed in glucose, lactate and IL-6 judo competition seem to be related to metabolism regulation to maintain the technical-tactical actions across the matches.

Fraser, S. (2018). In Memorium: A Tribute to Frank Andersson. *International Journal of Wrestling Science*, 8(2), 51-52.

Gierczuk, D., Bujak, Z., Cieslinski, I., Lyakh, V., & Sadowski, J. (2018). Response time and effectiveness in elite greco-roman wrestlers under simulated fight conditions. *Journal of strength and conditioning research*, 32(12), 3433-3440. doi:10.1519/jsc.0000000000002868

The purpose of the study was to determine changes in response time and its correlations with tactical and technical actions performed by Greco-Roman wrestlers in a fight. Twenty wrestlers aged 19-25 (21.4 +/- 1.8) years were divided into 2 groups, i.e., finalists of Polish Senior Championships (winners of 1st and 2nd places) and wrestlers who won 3rd-6th places in those competitions. The subjects from 1 group were individually paired with the wrestlers from the other group according to the same weight class. Response time before a fight and during the intervals between the 3 rounds was assessed. Batak Lite (test IV) was used in the study. The Polar M400 watch was used to register heart rate. Response time changed during a fight. The finalists showed significantly quicker reaction and performed a higher number of technical and tactical actions. The differences grew in the course of a fight, and the largest ones were observed during the third round. The strongest correlations were noted between response time and the number of technical and tactical actions performed during the third round ( $r = 0.77$ ,  $p < 0.001$ ). Response time is a significant determinant of wrestlers' results, which can be observed at submaximal intensity of the effort (176-195 b.min<sup>-1</sup>) during a fight.

Gleaves, J. (2018). Where's the Merit in That? Limits to Employing the Natural in Antidoping Ethics. *American Journal of Bioethics*, 18(6), 20-21. doi:10.1080/15265161.2018.1459942

The author responds to the article "Performance-Enhancing Drugs, Sport and the Ideal of Natural Athletic Performance," by Sigmund Loland, that was published within the issue. Topics discussed include the use of performance-enhancing drugs in sports, the argument that the natural can provide a normative standard for sport, and acceptable efforts to enhance sporting performance.

Goncharov, O. Г., Олексій]. (2018). Quality of life of veterans of sports with osteochondrosis of the lumbosacral spine/Якість життя ветеранів спорту з остеохондрозом попереково-крижового відділу хребта. *Slobozhanskyi R & Sports Bulletin*, 63(1), 15-18.

Purpose: to establish the effect of a comprehensive program of physical rehabilitation on the quality of life of wrestlers – veterans of sports with osteochondrosis of the lumbosacral spine in the training motor regime. Material

& Methods: 34 athletes-veterans at the age of 36–45 years, a kind of struggle – judo and sambo-wrestling took part in the study. Sports qualification of athletes: MS – 25 people, MSIG – 9 people. The test was carried out on the verbal assessment scale of pain, the degree of vertebro-neurological disorders was assessed, the standard of living for the Oswestrovsky questionnaire was determined. Results: after application of the proposed comprehensive physical rehabilitation program for wrestlers – veterans of sports of the MG in 68% of cases, complaints were absent, the degree of vertebro-neurological disorders decreased, the results of the questionnaire on the Oswestrovsky questionnaire showed a statistically significant decrease in complaints of pain in various spheres of life. Conclusion: the positive influence of the developed program of physical rehabilitation on the quality of life of wrestlers – veterans of sports is proved.

Goncharov, O., [Олексій]. (2018). Warm-up activity does not produce potentiation post-activation in wrestling athletes / Динаміка показників емпіричного дослідження та біогеометричного профілю у борців - ветеранів спорту з остеохондрозом попереково-крижового відділу хребта *Slobozhanskyi R & Sports Bulletin*, 66(4), 58-62. Purpose: to evaluate the effectiveness of the program of physical rehabilitation on the basis of studying the dynamics of indicators of empirical research, vertebro-neurological symptoms and biogeometric profile in wrestlers – veterans of sports with osteochondrosis of the lumbosacral spine. Material & Methods: theoretical analysis and generalization of literature data; use of diagnostic scales (visual analogue pain scale (VAS), scale of five-point evaluation of vertebro-neurological symptoms), determination of mobility of the lumbosacral spine, Schober's test, Tommyer test – fingers-floor test; methods of mathematical statistics. Results: based on the results of the study, a statistically significant dynamics of the parameters of the empirical study, the parameters of the biogeometric profile in the wrestlers – the veterans of the main group sport, was found in the course of physical rehabilitation according to the developed program with the application of therapeutic gymnastics, exercises in post-isometric relaxation. Conclusion: the results of the study confirmed the effectiveness of the comprehensive physical rehabilitation program developed by us, showed that a positive effect on the index of pain, vertebro-neurological symptoms, an increase in the amplitude of the spinal motion in both the sagittal and frontal planes.

Goodman, A. D., DeFroda, S. F., Gil, J. A., Kleiner, J. E., Li, N. Y., & Owens, B. D. (2018). Season-Ending Shoulder Injuries in the National Collegiate Athletic Association: Data from the NCAA Injury Surveillance Program, 2009-2010 Through 2013-2014. *American journal of sports medicine*, 46(8), 1936-1942. Background: Examination of the incidence of shoulder season-ending injury (SEI) in the collegiate athlete population is limited. Purpose: To determine the incidence of shoulder SEI in the National Collegiate Athletic Association (NCAA) and to investigate the risk factors for a shoulder injury ending an athlete's season. Study Design: Descriptive epidemiology study. Methods: All shoulder injuries from the NCAA Injury Surveillance Program database for the years 2009-2010 to 2013-2014 were extracted, and SEI status was noted. The incidences of SEI and non-SEI were calculated for athlete, activity, and injury characteristics and compared via univariable analysis and risk ratios to determine risk factors for an injury being season ending. Results: Shoulder injuries were season ending in 4.3% of cases. The overall incidence of shoulder SEI was 0.31 per 10,000 athlete exposures (AEs), as opposed to 7.25 per 10,000 AEs for all shoulder injuries. Shoulder instability constituted 49.1% of SEI, with an incidence of 0.15 per 10,000 AEs, while fractures had the highest rate of being season ending (41.9%). Men's wrestling had the highest incidence of shoulder SEI (1.65 per 10,000 AEs), while men's soccer had the highest proportion of shoulder injuries that ended a season (14.6%). Overall, men had a 6.3-fold higher incidence of SEI than women and a 2.4-fold increased likelihood that an injury would be season ending. Conclusion: Injury to the shoulder of an NCAA athlete, while somewhat infrequent, can have significant implications on time lost from play. Incidence of these injuries varies widely by sport and injury, with a number of associated risk factors. Athletes sustaining potentially season-ending shoulder injuries, with their coaches and medical providers, may benefit from these data to best manage expectations and outcomes.

Groth, B., Foote, D. M., & Horswill, C. A. (2018). Defining the Wrestler's Body – Appropriate Measures for Targeting Weight Class. *International Journal of Wrestling Science*, 8(1), 4-12. Competition within a specified weight class is a fixture in the sport of wrestling to help prevent injury and allow equal opportunity among participants. Weight reduction to a lower than normal weight class is a common practice in the U.S. Because of adverse events with such practice, national governing bodies (NGB) in the states have established programs to guide wrestlers to safe weight classes based on body composition. For large teams of participants, the field assessments adopted by NGB's include anthropometry using skinfold thicknesses (SF) and bioelectrical impedance analysis (BIA) because of the validation testing and efficiency. The standard used to calibrate, or cross validate SF, BIA, and any other field methods has most often been densitometry that typically relies on hydrostatic weighing of the athlete (HW). Assumptions on which HW was developed include fixed constants for hydration and mineralization of the fat-free body. However, maturation level, gender, and ethnicity will alter these constants and leave densitometry to be erroneous regardless of whether HW or other methods (air displacement plethysmography) are applied as the validation standard. The biological variability of the wrestler



body must be accounted for to develop accurate and reliable methods. In this way, fair and safe minimal weight programs can be implemented in the sport.

- Guillen Pereira, L., Copello Janjaque, M., Gutierrez Cruz, M., & Guerra Santiesteban, J. R. (2018). Methodology for improving the teaching-learning process of technical-tactical elements in combat sports. / Metodología para el perfeccionamiento del proceso de enseñanza-aprendizaje de los elementos técnicos-tácticos en los deportes de combate. *Retos: Nuevas Perspectivas de Educación Física, Deporte y Recreación*(34), 33-39.
- Enhancing Sports Initiation phase commits very closely to the knowledge of novel and contemporary issues originated from the pedagogical context, and the ways to manage them. As a result, methodologies applied to any sport discipline demand continuous updating in the theoretical, methodological, and practical aspect. Based on that, the present investigation had the objective to validate a methodology to perfect the learning process of tactical and technical elements in combat sports. Three disciplines (Karate, Judo and Taekwondo) were taken into account, with a sample of 265 coaches selected intentionally from a population of 852, reflecting the proportion of coaches in each discipline: Judo 96; Karate: 83; Taekwondo: 77. An instrument composed of 12 indicators was developed for the validation of the proposal. Five criteria were defined: Excellent, Very Good, Good, Fair and Poor, each of them having been assigned a code; to obtain objective results, we used the Tórgerson Mathematical Model, which allowed to define cut-off points for the methodology evaluation criteria; for the validation of the proposal, a pedagogical pre-experiment was applied. Data were compared employing Wilcoxon test for related samples. Results showed high significance in all cases ( $p = .002$ ). Therefore,  $H_0$  is rejected whereas  $H_1$  is accepted, which demonstrates the validity of the methodology.
- Haik, J., Givol, O., Kornhaber, R., Cleary, M., Ofir, H., & Harats, M. (2018). Cauliflower ear - a minimally invasive treatment method in a wrestling athlete: a case report. *International Medical Case Reports Journal*, 11, 5-7. doi:10.2147/imcrj.s152145
- Acute auricular hematoma can be caused by direct blunt trauma or other injury to the external ear. It is typically seen in those who practice full contact sports such as boxing, wrestling, and rugby. "Cauliflower ear" deformity, fibrocartilage formation during scarring, is a common complication of auricular hematomas. Therefore, acute drainage of the hematoma and postprocedural techniques for preventing recurrence are necessary for preventing the deformity. There are many techniques although no superior method of treatment has been found. In this case report, we describe a novel method using needle aspiration followed by the application of a magnet and an adapted disc to the affected area of the auricular. This minimally invasive, simple, and accessible method could potentially facilitate the treatment of cauliflower ear among full contact sports athletes.
- Hammami, N., Hattabi, S., Salhi, A., Rezgui, T., Oueslati, M., & Bouassida, A. (2018). Combat sport injuries profile: A review. *Science & Sports*, 33(2), 73-79.
- Summary Objectives The purpose of this review is to provide an overview of the injury location, injury diagnosis, injury risk factors and injury prevention among practitioners of different combat sports. News This review was conducted using databases of MEDLINE (via Pubmed), Science Direct, Scopus and Google Scholar. The studies concerned were classified according to the nature of the combat sports and the type of the injury by three authors using the titles, abstracts and full texts if available. Data from different observational studies suggest that there is a significant injury problem in combat sport in general because the main goal of the practitioners is to strike and/or to project opponent with maximal power and speed in order to win. This exposes them to permanent risk of injuries, which limit usually training effects, provoke disability conditions with competitiveness loss and often ruin their careers. However, it varies considerably across different styles. Researchers used retrospective and prospective method to explore specificity of injury but little is known about the actual severity of injuries in combat sports. Prospects and projects Future studies are highly encouraged to adopt stronger methodologies. The long-term consequences of injuries, a detailed balance sheet by nature of injury and specific preventive strategies are needed to support the findings presented in this review. Conclusion In this review, a preliminary injury profiles in combat sports was established containing location and types of injuries. Compared to other sports, combat sports are no more dangerous especially for beginner practitioners.
- Helm, N., Prieske, O., Muehlbauer, T., Krüger, T., Chaabene, H., & Granacher, U. (2018). Validation of A New Judo-Specific Ergometer System in Male Elite and Sub-Elite Athletes. *Journal of Sports Science and Medicine*, 17, 465-474.
- Our experimental approach included two studies to determine discriminative validity and test-retest reliability (study 1) as well as ecological validity (study 2) of a judo ergometer system while performing judo-specific movements. Sixteen elite (age:  $23 \pm 3$  years) and 11 sub-elite (age:  $16 \pm 1$  years) athletes participated in study 1 and 14 male sub-elite judo athletes participated in study 2. Discriminative validity and test-retest reliability of sport-specific parameters (mechanical work, maximal force) were assessed during pulling movements with and without tsukuri (kuzushi). Ecological validity of muscle activity was determined by performing pulling movements using the ergometer without tsukuri

and during the same movements against an opponent. In both conditions, electromyographic activity of trunk (e.g., m. erector spinae) and upper limb muscles (e.g., m. biceps brachii) were assessed separately for the lifting and pulling arm. Elite athletes showed mostly better mechanical work, maximal force, and power ( $0.12 \leq d \leq 1.80$ ) compared with sub-elite athletes. The receiver operating characteristic analysis revealed acceptable validity of the JERGo© system to discriminate athletes of different performance levels predominantly during kuzushi without tsukuri (area under the curve = 0.27-0.90). Moreover, small-to-medium discriminative validity was found to detect meaningful performance changes for mechanical work and maximal force. The JERGo© system showed small-to-high relative (ICC = 0.37-0.92) and absolute reliability (SEM = 10.8-18.8%). Finally, our analyses revealed acceptable correlations ( $r = 0.41-0.88$ ) between muscle activity during kuzushi performed with the JERGo© system compared with a judo opponent. Our findings indicate that the JERGo© system is a valid and reliable test instrument for the assessment and training of judo-specific pulling kinetics particularly during kuzushi movement without tsukuri.



Judo ergometer (JERGo©) system with real time display for judo-specific performances (i.e., mechanical work, maximal force, power) and force displacement characteristics for the pulling (left display) and the lifting (right display) arm during repeated *kuzushi* movements.

Herrera-Valenzuela, T., Valdes-Badilla, P., & Pardo, C. (2018). 2nd International Congress on High Performance Sports: a report on martial arts and combat sports. / II Międzynarodowy Kongres Sportów Wyczynowych: raport na temat sztuk walki i sportów walki. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 18(3), 51-53. Introduction. Martial arts and combat sports are practiced by thousands of people 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 II International Congress on High Performance Sports, an event hosted by Universidad Santo Tomas and the High Performance Center, Government of Chile. Results. Tree of the 15 plenary conferences and one of the 16 workshops focused on martial arts and combat sports. Conclusions. The conference was attended by four professionals from martial arts and combat sports, of note was the presence of Dr. Emerson Franchini. This shows that applied science in martial arts and combat sports is gaining traction within scientific events in the Chilean context, allowing the scientific community to learn about advances related to performance in combat sports.

Hogrefe, S., Ruiz-Barquin, R., & Molinero, O. (2018). Anxiety and coping strategies of judo competitors / Ansiedad y estrategias de afrontamiento en judokas de competición. . *Revista de Artes Marciales Asiaticas*, 13, 23-26. The aim of this study was to describe the anxiety responses and coping strategies used by competitive judokas of different sex category, level of performance, experience and age category. The sample was composed of 58 competitive Spanish judokas. They completed a battery of test composed by a socio-demographic questionnaire, the CSAI2R and the ISRAB, responses version, to evaluate anxiety. Finally, we used the ISCCS to evaluate the judokas' coping strategies. The results showed that women, low performance judokas, experienced judokas and the top age categories (junior and senior) presented high levels of anxiety and lower auto confidence. Correlational analysis showed that judokas' most used strategies were task oriented coping (TOC), though with high levels of anxiety they choose emotional oriented coping (EOC), which the scientific literature does not associate with good performance. In addition, high levels of auto confidence correlated positively with distraction-oriented coping (DOC). The practical implication of this work relates to the usefulness of this information for the improvement and optimization of competitive judokas' copying strategies.

Holiaka, Serhii & Hluhov, Ivan [Голяка, С., & Глухов, І. (2018). Антропометричні та функціональні показники спортсменів з різним типом конституції тіла / Anthropometric and functional indicators of athletes with different types of body constitution. *Slobozhanskyi R & Sports Bulletin*, 68(6), 44-48. Purpose: to determine the main anthropometric indicators, the level of the functional state of the cardiovascular and respiratory systems of athletes, depending on the type of constitution of their body. Material & Methods: in the course of the study, measurements were made of the type of body constitution, morphological indicators and indicators of the functional state of the cardiovascular and respiratory systems of athletes. Two experimental groups were formed from specialized sport school athletes. Results: the analysis of anthropometric and functional indicators of the cardiovascular and respiratory systems of athletes specializing in freestyle wrestling and rowing from specialized sport school is carried out. The dependence of the state of morphological and functional parameters of athletes depending on the type of body constitution is shown. Conclusion: the dependence is

established between the type of body constitution with the morphological and functional indicators of athletes specializing in freestyle wrestling and canoeing.

Hosseini, T., Rabiee, M.-A., Arefi, R. G., Ramazani, F., & Yaghoubi, A. (2018). Correlation Between Anthropometric, Physical Fitness Traits, Lung Capacity, and Success of Iranian Elite Greco-Roman Wrestlers. *Asian Journal of Sports Medicine*, 9(4), 1-6.

Objectives: This study aimed to evaluate how lung capacity and anthropometric and physical fitness traits are associated with success of Iranian elite Greco-Roman wrestlers. Methods: Twenty-five male Iranian elite Greco-Roman wrestlers (22 ± 4 years old) (both of light and heavy weights) participated in the present study. Anthropometric characteristics, physical fitness traits, and lung capacity were tested in the exercise physiology laboratory. Results: Our results showed a significant and positive correlation between arm span, as the only anthropometric trait, and success of Iranian elite Greco-Roman wrestlers. Also, maximal oxygen consumption, dead lift, squat, bench press, agility, shoulder and wrist elevation, sit and reach, eye/left hand reaction time, eye/foot reaction time, ear/left hand reaction time, ear/foot reaction time were positively correlated with success. Furthermore, there were significant and positive correlations between inspiratory reserve volume, tidal volume, forced vital capacity, forced expiratory volume (in one second), maximal voluntary ventilation, and success. In contrast, we observed a negative and significant correlation between body fat (%) and success of Iranian elite Greco-Roman wrestlers. Conclusions: Physical fitness traits and lung capacity have a greater potential than anthropometric characteristics in the prediction of Greco-Roman wrestler's success in championship levels.

Isik, O., & Gumus, H. (2018). Evaluation of effective demographic variables in competition performances of Turkish wrestling referees. *Journal of Human Sport & Exercise*, 13(1), 60-71.

Management of wrestling competitions of equal competitors is often assigned to successful referees. For this reason, it is important to determine the demographic variables that influence the referees' level of success. In this context, the aim of the study was to evaluate the effective demographic variables in competition performances of Turkish wrestling referees using the logistic regression analysis. The purpose of this research was explained to the referees and voluntary participation was provided. The research data consist of demographic variables and the referee evaluation reports of the year 2016 calculated by the Central Referee Committee of the Turkish Wrestling Federation. The referees were classified as successful (between 7-8.5 points) and unsuccessful (between ≥8.5-10 points) according to their performance scores. Accordingly, the international referees were 49 times more successful than the national referees in a competition. The referees who wrestled at the international level were 6 times more successful than the referees wrestling at the national level and who did not wrestle. Referees whose ages 31-40 and ≥41 were 7.9 and 24.9 times more successful than ≤30 age respectively. Moreover, it was determined that those who were refereeing for social identity, a hobby, and other reasons in a competition were, respectively, 6.39 and 22 times more possible to be successful than those who were refereeing for social status. Consequently, if a successful referee performance was desired, the ones should be selected as who were over 41 years of age and wrestled at the international level, and who were international level referees that were refereeing as a hobby or other. Thus, a more successful referee performance can be achieved in competitions.

Isik, O., Yildirim, I., Ersoz, Y., Koca, H. B., Dogan, I., & Ulutas, E. (2018). Monitoring of pre-competition dehydration-induced skeletal muscle damage and inflammation levels among elite wrestlers. *Journal of Back & Musculoskeletal Rehabilitation*, 31(3), 533-540.

BACKGROUND: Weight loss practice before competitions is a common method in weight sports. OBJECTIVE: The current study aimed to monitor Plasma Osmolarity (POsm), skeletal muscle damage and inflammation levels induced by pre-competition dehydration among elite wrestlers. METHODS: Twenty-four male elite wrestlers participated in the study. A survey information form that assessed pre-competition weight loss practices were administered to the wrestlers. Additionally, Total Creatine Kinase (CK), Lactate Dehydrogenase (LDH), Aspartate Aminotransferase (AST), Alanine Aminotransferase (ALT), C-reactive Protein (C-RP) and P Osm, analyses were evaluated by a specialist at the biochemical laboratory. POsm level for euhydration is < 290 mOsm/L. But if POsm level is > 290, then dehydration occurs. The wrestlers were divided into two groups according to POsm levels as weight loss and non-weight loss group. RESULTS: There were differences in the pre and post-test POsm levels of weight loss group. Similarly; it was identified that there were also statistically significant differences in terms of ALT, LDH and CK levels of weight loss group between pre and post-test. CONCLUSIONS: It was seen that POsm and levels of all indicators of skeletal muscle damage were higher than non-weight loss group. However, it was found that there were not any differences in terms of C-RP levels.

Iwai, K., Takahashi, R., Yumoto, K., & Nakazato, K. (2018). Methodological Development of a Wrestling Shuttle Test. *International Journal of Wrestling Science*, 8(1), 22-26.

The purpose of this study was to develop a wrestling shuttle test (WST) based upon four elements. Firstly, the WST was conducted on a regulation wrestling mat surface making it specific and familiar to a competition area. It is convenient to administer in a typical wrestling venue by a coach or tester. Secondly, the WST included

movements in four different directions across the entire mat surface including wrestling-specific standing movements (sidestepping). Thirdly, the test was based on the international match length consistent with United World Wrestling (UWW) rules of match duration of two three-minute periods of activity with a 30 second rest period. Lastly, the shuttle test focused on the individuality of the participant, that is, without a partner or others, to ensure results are solely of the participants' individual effort.

Jakovljević, D. K., Eric, M., Jovanovic, G., Dimitric, G., Cupic, M. B., & Ponorac, N. (2018). Explosive muscle power assessment in elite athletes using Wingate anaerobic test. / Evaluación de la fuerza muscular explosiva en atletas de élite usando la prueba anaeróbica de wingate. *Revista Brasileira De Medicina Do Esporte*, 24(2), 107-111. Introduction: Maximal effort physiological tests provide information about the current functional capacity of athletes. Objective: The aim of this study was to evaluate anaerobic performance parameters in elite athletes and to compare them in terms of the specific demands of each sport. We also created and applied the new software which enables us to quantify a new parameter -explosive muscle power (EP), a major component in sports requiring explosive bursts of movement lasting from a few seconds to 1 or 2 minutes. This new parameter reflects the velocity of energy transformation from intramuscular ATP and high-energy phosphates into mechanical power. Methods: All Wingate test parameters (standard parameters) - anaerobic power (AP), anaerobic capacity (AC), and explosive power (EP) as the new parameter were recorded in 104 subjects: 30 non-athletes and 74 athletes divided into different groups depending on their sport specialty (20 rowers, 28 wrestlers and 26 soccer players). Results: Anaerobic power (AP), anaerobic capacity (AC) and explosive power (EP) were significantly higher in the group of athletes compared to non-athletes. Among athletes, significant differences were observed in some parameters according to the type of activities they are involved in. The highest values were recorded in the group of wrestlers (AP=836W; AC=16.6kJ; EP=139W/s). The values of AP (absolute values) and EP (absolute and relative values) were significantly higher in wrestlers than in soccer players and rowers, but there was no significant difference in AC among these groups. The EP variable had a distribution similar to AP. Conclusions: Alongside anaerobic power and anaerobic capacity, the assessment of explosive power may complement the anaerobic profile of athletes. Experts in the field of sports medicine and exercise physiology could find these results useful in improving test variables, which are more important for specific sports, and for evaluating and monitoring training progress.

Jun-Young, S., Sok, P., Soon-Gill, L., Sun-Kyung, L., Deuk-Mo, K., Minki, L., & Hee-Jae, K. (2018). Effect of Spatone Supplement on Endurance Capacity and Inflammatory Cytokines in a Rapid Weight Control Program in University Wrestlers: A Pilot Study. *Journal of Medicinal Food*, 21(8), 832-839. doi:10.1089/jmf.2017.4085 In this pilot study, we investigated the effect of Spatone, a naturally occurring mineral water supplement, on endurance capacity and inflammatory cytokines in wrestlers undergoing a rapid weight control program. Nine amateur university wrestlers participated and were randomly divided into placebo- and spatone-treated groups. The study used a crossover design, including a 4-week washout period. The rapid weight control program was focused on body weight loss, while maintaining their athletic performance (muscular strength and cardiovascular endurance). The initial body weight was  $87.19 \pm 2.45$  kg in the spatone-treated group and  $86.60 \pm 3.01$  kg in the placebo group. After the rapid weight control program, the body weight decreased to  $83.56 \pm 2.71$  kg (4.21% decrease) in the spatone-treated group and  $82.95 \pm 2.97$  kg (4.16% decrease) in the placebo group. However, there were no significant differences in body weight or body composition between placebo- and spatone-treated groups. Endurance capacity improved significantly in terms of VO<sub>2</sub>max and lactate accumulation after spatone supplement. The interleukin (IL)-10, tumor necrosis factor (TNF)-alpha, and IL-6 concentrations were not altered with spatone treatment or placebo in the rapid weight-loss condition; however, a positive relationship ( $R = 0.643$ ,  $P = .023$ ) was observed between the change in IL-6 and VO<sub>2</sub>max. Thus, our results are consistent with prior studies in that spatone supplementation could protect against iron loss induced by intense training, considering that spatone affects the modulation of inflammatory cytokines and exercise capacity. These preliminary results serve to facilitate the planning for the nutritional application of spatone with their exercise program for wrestlers.

Karninčić, H., Baić, M., Slaćanac, K., Penjak, A., & Jelaska, I. (2018). Relationship Between Training Experience and Pre-Competition Mood States in Cadet Wrestlers. *International Journal of Wrestling Science*, 8(2), 9-13. It is a general assumption that training experience and mood states correlate, so that more experienced competitors are better in keeping pre-competition negative moods under control. This article addresses the issue of whether the same is assumption is valid for adolescent wrestlers. The aim of the study was to establish the correlation between training experience and pre-competition mood states in adolescent wrestlers. The sample consisted of 75 adolescent wrestlers (age  $16.04 \pm 0.83$ ) divided in two groups depending on their training experience: the less experienced wrestlers ( $n=33$ ) had  $2.88 \pm 1.04$  years of experience and the more experienced wrestlers ( $n=42$ ) had  $6.86 \pm 1.60$  years of wrestling training experience. All the participants completed the psychological questionnaire for mood assessment (Brunel Mood Scale – BRUMS) half an hour before the national championship. The Vigor variable ( $F(1.75) = 8.78$ ;  $p=0.004$ ) was the only variable in which the two groups differed. The less experienced wrestlers self-reported to have more energy, but they also connected their mood states with competition placement and body mass reduction, which clearly indicated a different structure of emotions control

between these groups. The body mass reduction among the less experienced wrestlers was strongly connected to negative emotions, primarily anger ( $r=0.60$ ) and depression ( $r=0.47$ ). Competition placement was negatively connected to anger ( $r=-0.41$ ) and positively to vigour ( $r=0.34$ ). No significant correlations between the variables were established among the more experienced wrestlers. We may conclude that, although only one significant association was found (energy) in mood states, the more experienced U17 wrestlers can better control their negative pre-competition mood states than those less experienced wrestlers whose negative mood states are connected to body mass reduction and performance.

Kavoura, A., Kokkonen, M., Chroni, S. A., & Ryba, T. V. (2018). "Some Women Are Born Fighters": Discursive Constructions of a Fighter's Identity by Female Finnish Judo Athletes. *Sex Roles*, 79(3/4), 239. 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.

Kaynar, O. (2018). Infectious dermatological diseases findings of the wrestlers according to regions. *Journal of Turgut Ozal Medical Center*, 25(1), 65-69. doi:10.5455/jtomc.2017.12.149

Aim: Dermatologic diseases are commonly found in people engaged in contact sports. Particularly wrestlers can easily contract skin infections. The aim of this study is to reveal the incidence of infectious skin diseases engaged in wrestling athletes living in different climate regions. Material and Methods: Three hundred nineteen volunteers who actively wrestle in different climate regions of Turkey participated to the research. All of the athletes were asked the questions in the survey of "Personal History and Dermatological Examination Findings of Athlete". The findings and diagnoses of each wrestler were then recorded and evaluated. Results: Dermatological diseases were observed in 195 (61.12%) Turkish wrestlers, 84 (26.33%) in the eastern region, 43 (13.47%) in the inland region and 68 (21.32%) in the coastal region. These diseases were 118 (36.99%) fungal, 49 (15.36%) bacterial and 28 (8.77%) viral, respectively. It was found that infectious dermatological diseases were observed more frequently in the eastern and coastal regions than inland region and this difference was statistically significant. ( $P = 0.045$ ). Conclusion: In this study which is the first study conducted on this issue in sports literature, various infectious dermatological diseases were detected in wrestlers living in different climate regions in Turkey and it was determined that these diseases differ by climate regions.

Keskin, A., Hazar, S., Kayabas, O., & Cesur, K. (2018). THE EFFECT OF TRAINING WITH EMPTY AND FULL BLADDER ON HEMATURIA IN WRESTLERS / GÜREŞÇİLERDE BOŞ VE DOLU MESANE İLE YAPILAN ANTRENMANIN HEMATURİYE ETKİSİ. *Journal of Physical Education & Sports Science / Beden Eğitimi ve Spor Bilimleri Dergisi*, 12(3), 153-159.

The aim of this study is to investigate whether the occupancy status of the bladder affects the hematuria in wrestling training. 13 active wrestlers participated voluntarily between the ages of 20 and 26 years in Niğde Ömer Halisdemir University wrestling team. The participants were performed the same content and intensity wrestling training as empty and full bladder on different days. Urine samples that taken before and after training were centrifuged at 2500 rpm for 3 minutes. Erythrocyte and leukocyte values were examined between the sediment lam and lamella x40 magnification in light microscope. Friedman variance analysis was used for the statistical comparison of the obtained values, Wilcoxon Signed Rank test was used to pairwise comparisons. In the study, it was found that there was a significant increase in both erythrocyte and leukocyte values at the end of the training in empty bladder training ( $p<0.01$ ). On the other hand, it was determined in full bladder training that the increase neither leukocyte nor erythrocyte values after training was not statistically significant. However, significant differences were determined between post-training values with filled and empty bladder ( $p<0.01$ ). As a result, hematuria, which is frequently seen in heavy physical activities, is affected by the fact that the bladder of the athlete is empty or full. Considering the impact on sporting performance, it is recommended that the bladder be filled with a certain amount, especially in combat sports.

Kirk, C. (2018). Does anthropometry influence technical factors in competitive mixed martial arts? *Human Movement*, 19(2), 46-59.

Purpose. Previous research has found grappling and strikes to the head to be the determining factors for success in MMA, whilst anthropometry in the form of stature and wingspan has been found to have a negligible effect. The current study was designed to determine if a relationship between technique use and anthropometry exists in MMA. Methods. The in-competition technique data of 461 elite, professional MMA bouts were compared using Bayes factor t-tests (bF10) to determine which techniques display the highest likelihood of distinguishing between winners and losers. The differences in technique numbers between winners and losers was also compared to the anthropometric differences between winners and losers using either Bayesian Pearson's r or Bayesian Kendall's tau. Simple linear regression ( $p < 0.05$ ) was used to calculate predictive ability of anthropometrics on chosen fighting techniques. Results. Heavyweight competitors were distinguished by striking only (bF10 = 399 - 10). Light heavyweight, middleweight, featherweight, bantamweight, women's bantamweight and women's straw weight competitors were distinguished predominately by striking (bF10 = 791661 - 7) and moderately by grappling (bF10 = 75 - 7). Welterweight, lightweight and flyweight competitors were distinguished by striking techniques (bF10 = 3.533e+6 - 221) to achieve dominant grappling positions (bF10 = 17100 - 50). In turn, it was found that stature and/or wingspan are correlated to and can predict key technique variables at heavyweight, welterweight, lightweight and featherweight. Conclusions. the results provide evidence of which techniques are influenced by the anthropometric differences between competitors, allowing coaches and competitors to make more informed tactical decisions in competition preparation.

Kondo, E., Sagayama, H., Yamada, Y., Shiose, K., Osawa, T., Motonaga, K., . . . Okamura, K. (2018). Energy Deficit Required for Rapid Weight Loss in Elite Collegiate Wrestlers. *Nutrients*, 10(5), N.PAG-N.PAG. doi:10.3390/nu10050536

To determine energy density for rapid weight loss (RWL) of weight-classified sports, eight male elite wrestlers were instructed to lose 6% of body mass (BM) within 53 h. Energy deficit during the RWL was calculated by subtracting total energy expenditure (TEE) determined using the doubly labeled water method (DLW) from energy intake (EI) assessed with diet records. It was also estimated from body composition change estimated with the four-component model (4C) and other conventional methods. BM decreased significantly by  $4.7 \pm 0.5$  kg ( $6.4 \pm 0.5\%$ ). Total body water loss was the major component of the BM loss ( $71.0 \pm 7.6\%$ ). TEE was  $9446 \pm 1422$  kcal, and EI was  $2366 \pm 1184$  kcal during the RWL of 53-h; therefore, the energy deficit was  $7080 \pm 1525$  kcal. Thus, energy density was  $1507 \pm 279$  kcal/kg  $\Delta$ BM during the RWL, comparable with values obtained using the 4C, three-component model, dual energy X-ray absorptiometry, and stable isotope dilution. Energy density for RWL of wrestlers is lower than that commonly used (7400 or 7700 kcal/kg  $\Delta$ BM). Although RWL is not recommended, we propose that commonly practiced extreme energy restriction such as 7400 or 7700 kcal/kg  $\Delta$ BM during RWL appears to be meaningless.

Kons, R. L., Ache-Dias, J., Detanico, D., Barth, J., & Pupo, J. D. (2018). Is vertical jump height an indicator of athletes' power output in different sport modalities? *Journal of Strength & Conditioning Research (Lippincott Williams & Wilkins)*, 32(3), 708-715.

This study aimed to identify whether the ratio standard is adequate for the scaling of peak power output (PPO) for body mass (BM) in athletes of different sports and to verify classification agreement for athletes involved in different sports using PPO scaled for BM and jump height (JH). One hundred and twenty-four male athletes divided into 3 different groups-combat sports, team sports, and runners-participated in this study. Participants performed the countermovement jump on a force plate. Peak power output and JH were calculated from the vertical ground reaction force. We found different allometric exponents for each modality, allowing the use of the ratio standard for team sports. For combat sports and runners, the ratio standard was not considered adequate, and therefore, a specific allometric exponent for these 2 groups was found. Significant correlations between adjusted PPO for BM (PPOADJ) and JH were found for all modalities, but it was higher for runners ( $r = 0.81$ ) than team and combat sports ( $r = 0.63$  and  $0.65$ , respectively). Moderate agreement generated by the PPOADJ and JH was verified in team sports ( $k = 0.47$ ) and running ( $k = 0.55$ ) and fair agreement in combat sports ( $k = 0.29$ ). We conclude that the ratio standard seems to be suitable only for team sports; for runners and combat sports, an allometric model seems adequate. The use of JH as an indicator of power output may be considered reasonable only for runners.

Kons, R. L., Dal Pupo, J., Ache-Dias, J., & Detanico, D. (2018). Female judo athletes' physical test performances are unrelated to technical--tactical competition skills. *Perceptual & Motor Skills*, 125(4), 802-816.

This study analyzed the relationship between generic and judo-specific physical test performances and technical--tactical competition performances among 19 female judo athletes. Participant data were gathered in two stages: (a) physical tests--countermovement jump (CMJ), handgrip strength, Special Judo Fitness Test and Judogi Grip Strength Test; and (b) match performances recorded for technical--tactical analysis. Pearson's linear correlation and multiple linear regression analysis showed no significant correlations between any technical--tactical parameter and judo-specific physical tests. However, the number of attacks during matches was significantly

positively correlated with countermovement jump height (CMJJH;  $r = 0.69$ ,  $p = .002$ ), peak power output (CMJPPO;  $r = 0.53$ ,  $p = .002$ ), and peak velocity (CMJPV;  $r = 0.62$ ,  $p = .001$ ). Effective time during matches was significantly correlated with all CMJ parameters (except maximum force;  $r = 0.65-0.76$ ,  $p \leq .01$ ) and with right hand grip strength ( $r = 0.48$ ,  $p = .037$ ). Match effectiveness was correlated with CMJPPO ( $r = -0.67$ ,  $p = .001$ ), mean power output (CMJMPO;  $r = -0.54$ ,  $p = .017$ ), and CMJPV ( $r = -0.54$ ,  $p = .004$ ). The explained power of variance was low for all variables at 45-54%. We conclude that judo-specific performance tests do not seem to be related to female judo athletes' technical--tactical skills in official competition, though athletes with higher lower limb muscle power and higher handgrip strength showed higher time effectiveness during matches.

Korobeynikov, G., Korobeynikova, L., Potop, V., Nikonorov, D., Semenenko, V., Dakal, N., & Mischuk, D. (2018). Heart rate variability system in elite athletes with different levels of stress resistance. *Journal of Physical Education & Sport*, 18(2), 550-554.

Purpose: study of peculiarities of heart rate variability system in elite athletes with different level of stress resistance. Material: 26 elite athletes, members of the Ukrainian National Team in Greco-Roman wrestling took part in the research. The level of stress resistance (stress tolerance) was determined by the results of test called "Stress Test" The athletes were divided in two groups according to level of stress resistance. The cardiac monitor used was the «Polar RS800CX» for the study of heart rate variability. Results: It revealed the increasing of level of stress resistance related with improving the system of autonomic regulation of heart rate in elite athletes. This was reflected by a relaxation of the level of tension and activation of the parasympathetic part of autonomous nervous system. Were revealed the bigger meanings of LF/HF in athletes with average level of stress resistance for concerning to athletes of high level of stress resistance indicates the amplification of sympathetic and weakening of parasympathetic link of autonomic nervous system. Conclusions: The athletes with high stress resistance levels have high levels of heart rate variability and low of centralization of heart rate regulation when compared to athletes with average level of stress resistance.

Kostikiadis, I. N., Methenitis, S., Tsoukos, A., Veligekas, P., Terzis, G., & Bogdanis, G. C. (2018). The Effect of Short-Term Sport-Specific Strength and Conditioning Training on Physical Fitness of Well-Trained Mixed Martial Arts Athletes. *Journal of Sports Science & Medicine*, 17(3), 348-358.

The purpose of the present study was to investigate the effect of a short-term, high-intensity, low-volume Mixed Martial Arts (MMA) specific strength and conditioning training program on performance in national level MMA athletes. Seventeen experienced fighters were divided into two groups: (A) Specific Training Group (STG;  $n = 10$ ), which followed a specific strength and conditioning program designed according to the demands of MMA competition and (B) Regular Training Group (RTG;  $n = 7$ ), in which participants followed a regular strength and conditioning program commonly used by MMA athletes. Before and after the four-week training period (3 days per week), body composition, aerobic fitness, strength, power and speed were evaluated. Significant improvements in estimated  $VO_{2max}$ , average power during the 2000 m rowing, bench press, back squat and deadlift 1RM, SJ power, CMJ height power, medicine ball throw velocity, 10 m sprint and 2 m take down speed and fat-free mass were found only in the STG (3.7 to 22.2%;  $p < 0.05$ ; Hedge's  $g = -0.42 - 4.1$ ). No significant changes were found for the RTG ( $p = 0.225$  to  $0.811$ ). Significant differences between the groups were found for almost all post-training assessments ( $p < 0.05$ ; Hedge's  $g = 0.25 - 1.45$ ) as well as for the percentage changes from pre to post training ( $p < 0.05$ ; Hedge's  $g = 0.25 - 1.45$ ). Significant relationships were found between percentage changes in fat-free mass, endurance capacity, muscle strength/power and speed ( $r = -0.475$  to  $0.758$ ;  $p < 0.05$ ). These results suggest that a high-intensity, low-volume strength and conditioning training intervention designed according to the demands of MMA competition may result in significant performance improvements for well-trained fighters.

Książek, A., Dziubek, W., Pietraszewska, J., & Stowinska-Lisowska, M. (2018). Relationship between 25(OH)D levels and athletic performance in elite Polish judoists. *Biology of Sport*, 35(2), 191-196.

There is a growing body of evidence for a role of vitamin D in muscle function and for its influence on athletic performance, injury profile and recovery in well-trained athletes. The aim of our study was to assess the relationship between 25(OH)D levels and hand grip strength, lower limb isokinetic strength and muscle power in elite judoists. We enrolled 25 Polish elite judoists. The mean age was  $21.9 \pm 9.8$  years, the mean height was  $179.2 \pm 6.6$  cm, the mean body mass was  $79.1 \pm 8.7$  kg, and the mean career duration was  $11.5 \pm 3.9$  years. Serum levels of 25(OH)D and parathormone (PTH) were measured by electrochemiluminescence (ECLIA) using the Elecsys system (Roche, Switzerland). Serum calcium was determined by colorimetry using the Konelab 60 system from bioMérieux (France). Lower limb strength was tested with the Biodex Multi-Joint 4 Isokinetic Dynamometer (Biodex Medical System, New York, USA), and hand grip strength was measured with a manual dynamometer (TAKEI, Japan). Muscle power was determined with the electronic jump mat OptoJump (Microgate, Bolzano, Italy). Our study showed decreased serum 25(OH)D levels in 80% of the professional judoists. The results also demonstrated a statistically significant positive correlation between vitamin D levels and left hand grip strength, muscle power assessed by vertical jump, and total work in left and right knee extensors at an angular velocity of  $60^\circ/s$ . Based on our results it can be concluded that in well-trained professional athletes, there may be a relationship between serum levels of 25(OH)D and skeletal muscle strength, power, and work.

Latishev, S., Korobeynikov G., Latishev, N.V., Curby, D., Korobeynikova, L.G., Tropin, Y. (2018). Comparative Analysis of Matches of Russian Teams in Freestyle and Female Wrestling. *International Journal of Wrestling Science*, 8(2), 14-17.

The results of the performances of the Russian National Teams in Freestyle and Women's wrestling at the European Championships, World Championships and Olympics Games for the period from 1993 to 2016. Freestyle Team performs stably and successfully at all competitions, and the percentage of medalists is within 60 - 77.34% of the number of participants, more than half of the medals - gold. The results of the performance of the Women's Team are comparable to the results of the Freestyle Team only at European Championships, and at the World Championships and Olympics Games, the women's performance is much weaker.

Leite, N., Santos, S., Gonsalves, B., Silva, A., Duarte, R., & Sampaio, J. (2018). Examining the birthdates distribution of Beijing Olympic athletes. *Examen de la distribución de las fechas de nacimiento de los atletas olímpicos de Beijing.*, 27(1), 31-42.

The aim of this study was to examine the birthdate distribution of the entire population of athletes who participated in the 2008 Olympic Games, considering independently and simultaneously the effect of the following factors: (i) gender, (ii) sport category, (iii) continent and (iv) performance outcome. The sample included 10.900 athletes whose birthdates were gathered into quartiles and then inspected with chi-square test. The analyses performed to compare birthdates distribution considering each sport category (Individual, Combat, Net/Wall, Invasion/Team, Combined, Field/Run, Target and Early Specialization sports) separately by each continent and performance outcome. No differences were found in the birthdates distribution for gender ( $p > .05$ ). However, the results revealed significant differences in Asian males of Combat sports ( $\chi^2=12.2$   $p < .01$ ), South American males of Invasion/Team sports ( $\chi^2=9.7$   $p < .05$ ), Asian females of target sports ( $\chi^2=9.1$   $p < .05$ ) and Asian females of Early specialization sports ( $\chi^2=8.4$   $p < .05$ ), with a tendency to be born earlier in the year calendar. However, the North American females of Invasion/Team sports ( $\chi^2=13.9$   $p < .01$ ) showed a trend to be born more frequently in the middle of the year calendar. Our data were not entirely consistent with previous work, adding new insights to the relative age effects research. The influence of different levels of environmental constraints on athlete's birthdate distribution is proposed as the theoretical explanation for the encountered findings.

Li, P., De Bosscher, V., Pion, J., Weissensteiner, J. R., & Vertonghen, J. (2018). Is international junior success a reliable predictor for international senior success in elite combat sports? *European journal of sport science*, 18(4), 550-559. doi:10.1080/17461391.2018.1439104

Currently in the literature, there is a dearth of empirical research that confirms whether international junior success is a reliable predictor for future international senior success. Despite the uncertainty of the junior-senior relationship, federations and coaches still tend to use junior success as a predictor for long-term senior success. A range of former investigations utilising a retrospective lens has merely focused on success that athletes attained at junior level competitions. Success that was achieved at senior-level competitions but at a junior age was relatively ignored. This study explored to what extent international senior success can be predicted based on success that athletes achieved in either international junior level competitions (i.e. junior medalists) or senior competitions at a junior age (i.e. early achievers). The sample contains 4011 international male and female athletes from three combat sports (taekwondo, wrestling and boxing), who were born between 1974 and 1990 and participated in both international junior and senior-level competitions between 1990 and 2016. Gender and sport differences were compared. The results revealed that 61.4% of the junior medalists and 90.4% of the early achievers went on to win international medals at a senior age. Among the early achievers, 92.2% of the taekwondo athletes, 68.4% of the wrestling athletes and 37.9% of the boxing athletes could be reliably "predicted" to win international senior medals. The findings demonstrate that specific to the three combat sports examined, international junior success appears to be an important predictor to long-term international senior success.

Loland, S. (2018). Performance-Enhancing Drugs, Sport, and the Ideal of Natural Athletic Performance. *American Journal of Bioethics*, 18(6), 8-15. doi:10.1080/15265161.2018.1459934

The use of certain performance-enhancing drugs (PED) is banned in sport. I discuss critically standard justifications of the ban based on arguments from two widely used criteria: fairness and harms to health. I argue that these arguments on their own are inadequate, and only make sense within a normative understanding of athletic performance and the value of sport. In the discourse over PED, the distinction between "natural" and "artificial" performance has exerted significant impact. I examine whether the distinction makes sense from a moral point of view. I propose an understanding of "natural" athletic performance by combining biological knowledge of training with an interpretation of the normative structure of sport. I conclude that this understanding can serve as moral justification of the PED ban and enable critical and analytically based line drawing between acceptable and nonacceptable performance-enhancing means in sport.



- Lopes-Silva, J. P., Da Silva Santos, J. F., Artioli, G. G., Loturco, I., Abbiss, C., & Franchini, E. (2018). Sodium bicarbonate ingestion increases glycolytic contribution and improves performance during simulated taekwondo combat. *European journal of sport science*, 18(3), 431-440. doi:10.1080/17461391.2018.1424942  
Purpose: To investigate the effect of sodium bicarbonate (NaHCO<sub>3</sub>) on performance and estimated energy system contribution during simulated taekwondo combat. Methods: Nine taekwondo athletes completed two experimental sessions separated by at least 48 h. Athletes consumed 300 mg/kg body mass of NaHCO<sub>3</sub> or placebo (CaCO<sub>3</sub>) 90 min before the combat simulation (three rounds of 2 min separated by 1 min passive recovery), in a double-blind, randomized, repeated-measures crossover design. All simulated combat was filmed to quantify the time spent fighting in each round. Lactate concentration [La<sup>-</sup>] and rating of perceived exertion (RPE) were measured before and after each round, whereas heart rate (HR) and the estimated contribution of the oxidative (WOXI), ATP (adenosine triphosphate)-phosphocreatine (PCr) (WPCR), and glycolytic (W[La<sup>-</sup>]) systems were calculated during the combat simulation. Results: [La<sup>-</sup>] increased significantly after NaHCO<sub>3</sub> ingestion, when compared with the placebo condition (+14%, P = 0.04, d = 3.70). NaHCO<sub>3</sub> ingestion resulted in greater estimated glycolytic energy contribution in the first round when compared with the placebo condition (+31%, P = 0.01, d = 3.48). Total attack time was significantly greater after NaHCO<sub>3</sub> when compared with placebo (+13%, P = 0.05, d = 1.15). WOXI, WPCR, VO<sub>2</sub>, HR and RPE were not different between conditions (P > 0.05). Conclusion: NaHCO<sub>3</sub> ingestion was able to increase the contribution of glycolytic metabolism and, therefore, improve performance during simulated taekwondo combat.
- López, D. (2018). Scoring Analysis of the Senior World Wrestling Championships-2017. *International Journal of Wrestling Science*, 8(1), 27-82.  
To breakdown the scoring made by participants during Senior World Championships 2017, held in Paris, France, from August, 2017, in all three styles-Greco Roman, Women's Freestyle and Men's Freestyle. The present report follows the key features from reporting style and wrestlers' performance descriptors established by Dr. Harold Tünnemann during the last 2 decades. Some new indicators were added to expand the scope of data. Tools used for analyzing and describing scoring events were the official videos of the championships and Dartfish Team Pro 9 Video Analysis Software.
- López-González, L. M., Sánchez-Oliver, A. J., Mata, F., Jodra, P., Antonio, J., & Domínguez, R. (2018). Acute caffeine supplementation in combat sports: a systematic review. *Journal of the International Society of Sports Nutrition*, 15(1), N.PAG-N.PAG.  
Caffeine used as a supplement has been shown to improve physical and cognitive performance in several sport modalities due to its effects on the central nervous system. This review assesses the direct effects of caffeine supplementation on performance in combat sports. Using the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines, relevant studies were identified through the Medline, Scopus and SPORTDiscus databases. Of 1053 search results, only 9 articles fulfilled the inclusion criteria. Of these, three studies detected no ergogenic effect of caffeine supplementation, while six studies did observe a significant positive effect. Supplementation with 3–6 mg/kg of caffeine was found to increase the glycolytic contribution to energy metabolism during the execution of real or simulated combats, as indicated by elevated blood lactate concentrations. Caffeine intake was also noted to improve levels of strength, power and upper arm muscular endurance. These effects were not paralleled by an increase in the exertion perceived by the athlete.
- Mambetaliev, K. U. (2018). The Phenomenon of the World Nomad Games. *International Journal of Wrestling Science*, 8(2), 40-42.  
The phenomenon of the World Nomad Games is addressed through the study of the mission, as well as the fundamental principles of the Games. The sources and prerequisites for organizing the Games, their interrelation with other ethnic sports games and the phenomenon of the Nomad Games have been established. The research results can be recommended for the organization of other ethnic sports games.
- Martínez-Abellan, A. (2018). Proposal for a didactic unit of Olympic Wrestling: World Wrestling / Propuesta de unidad didáctica de lucha olímpica: Luchas del Mundo. / *Revista de Artes Marciales Asiáticas*, 13, 13-16.  
Wrestling is a natural human activity and it is represented in a large number of countries and cultures. In secondary education, combat sports can help students develop relevant skills and attitudes. Wrestling exercises develop motor, perceptual and affective capacities, since wrestling is a close contact sport. The objective of this work was to design a bilingual teaching unit aimed at the secondary education, where wrestling exercises are used to achieve educational purposes related to learning Olympic Wrestling and fostering situations of communication in English. The didactic unit, called Luchas del Mundo / World Wrestling, will have a recreational and integrative character, and will allow students to relate and communicate with their peers in English during the practical sessions. The didactic unit consists of six sessions, making a journey through different continents and wrestling styles, and finishing with the Olympic wrestling styles. All sessions will follow a similar scheme, starting with a general and specific warm up; following with the main part, in which representative wrestling exercises will be practiced (grips, holds, unbalancing, etc.); and finishing with a cool down, stretches and conclusions. In

summary, this proposal follows the contents worked in primary education physical education and tries to promote the practice of Olympic Wrestling in secondary education.

Mata-Ordoñez, F., Sanchez-Oliver, A., & Domínguez-Herrera, R. (2018). Importance of nutrition in weight loss strategies in combat sports / IMPORTANCIA DE LA NUTRICIÓN EN LAS ESTRATEGIAS DE PÉRDIDA DE PESO EN DEPORTES DE COMBATE. *Journal of Sport & Health Research*, 10, 1-12.

The purpose of this study was to establish the nutritional requirements and dietary strategies that can optimize the performance in combat sports. These include a wide variety of disciplines in which optimal body composition is required, as well as the development of muscular strength and power, flexibility, and anaerobic capacity development and aerobic power. For all this, food, hydration and nutrition play an important role in the development of them. The selection of articles was done by keywords martial arts y wrestling in combination with rapid weight loss, weight cutting, weigh-in, weight-loss, nutrition, hydration, sport nutrition, supplement, y ergogenic aids in the Elsevier, Medline, Pubmed and Web of Knowledge databases. In order to achieve optimal body composition, weight loss programs in combat athletes should be based on a progressive program that seeks to reduce the fat component (avoiding fast weight loss methods). These athletes should cover an intake of 2 g·kg·day<sup>-1</sup> protein and up to 8-10 g·kg·day<sup>-1</sup> carbohydrate, with lipid intake being 20-25% of energy intake. In addition, the athlete can optimize his performance if he realizes a previous hydration plan, during and after the effort. Providing adequate nutrition to help control performance limiting factors, facilitating good recovery after workouts and competitions, and helping to create better physiological adaptations for the combat sport performance is of vital importance.

Meron, A., McMullen, C., Laker, S. R., Currie, D., & Comstock, R. D. (2018). Epidemiology of Cervical Spine Injuries in High School Athletes Over a Ten-Year Period. *PM & R: Journal of Injury, Function & Rehabilitation*, 10(4), 365-372. doi:10.1016/j.pmrj.2017.09.003

Background: More than 7 million athletes participate in high school sports annually, with both the benefits of physical activity and risks of injury. Although catastrophic cervical spine injuries have been studied, limited data are available that characterize less-severe cervical spine injuries in high school athletes. Objective: To describe and compare cervical spine injury rates and patterns among U.S. high school athletes across 24 sports over a 10-year period. Design: Descriptive epidemiology study. Setting: National sample of high schools participating in the High School Reporting Information Online 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 the High School Reporting Information Online system during the 10-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, 1080 cervical spine injuries were reported during 35,581,036 athlete exposures for an injury rate of 3.04 per 100,000 athlete exposures. 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 with all other sports (injury proportion ratio 3.31; confidence interval 2.33-4.72), whereas in boys' ice hockey fractures represented a greater proportion of injuries compared with all other sports (injury proportion ratio 7.64; confidence interval 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.

Miarka, B., dal Bello, F., Brito, C. J., & Amtmann, J. (2018). Technical-tactical ratios by round, genders and weight division of mixed martial arts for training. *International Journal of Performance Analysis in Sport*, 18(1), 78-89.

This study compared the technical-tactical analysis by time ratios between genders and weight divisions of female mixed martial arts (MMA) athletes competing in the Ultimate Fighting Championships. Eighty-two athletes (G1 = 21 male middleweights, G2 = 14 male lightweights, G3 = 21 female middleweights, G4 = 14 female lightweights), were evaluated using a time-motion and technical-tactical protocol. Four hundred eighty-four males and 205 female MMA rounds were analysed. Time-motion and technical-tactical variables were evaluated according to frequency of attempts and effective strikes, takedowns and submissions, as well as fighting activity time and preparatory of standing and groundwork combat. Comparing groundwork preparatory activity time G1 showed longer times than other groups (35:0 ± 1.8 s;  $p \leq .002$ ). For standing fighting activity time, G2 showed longer times than other groups (151.2 ± 72.9 s;  $p \leq .001$ ). G2 displayed longer times between actions during standing [ $p = .003$ ; 1: 32.5 (17.8; 74.8)] and groundwork [ $p \leq .003$ ; 1: 30.0 (9.0; 52.0)] than G3. In conclusion, G1 and G2 showed longer groundwork and standing actions than G3 and G4. In standing and groundwork actions, G2 presented longer time between striking actions than G3.

Moen, F., Hrozanova, M., & Stiles, T. (2018). The effects of perceptual-cognitive training with Neurotracker on executive brain functions among elite athletes. *Cogent Psychology*, 5(1), 13. doi:10.1080/23311908.2018.1544105

The current study tests possible transfer effects from NT 3D MOT training among elite athletes from dynamic sports on executive brain functions, such as alerting, orienting, executive control, inhibition, shifting and updating. Sixty athletes from different sports, such as martial arts (boxing and wrestling), handball, soccer, orienteering, biathlon, alpine skiing, and Paralympic sports (sled hockey, badminton and table tennis), participated in a cross-over experiment-control group design over a period of 10 weeks. The results in the current study show specific training effects on training measures used by the NT 3D MOT tool, but no significant transfer effects on the executive functioning tests. The results are discussed based on the importance of training specificity and the mental state at the moment of NT 3D MOT training.

Moghaddami, A., Gerek, Z., Karimiasl, A., & Nozohouri, H. (2018). Evaluation of acute dehydration impacts on elite wrestlers' single-leg takedown technique by 3D motion analysis. *Medicina dello sport*, 71(1), 1-10. doi:10.23736/s0025-7826.17.02977-5

BACKGROUND: Weight cutting is a phenomenon that exists in combative weight-class-based sports. Many athletes with specific weight classifications, such as those in wrestling, judo, and weight lifting, want to participate in competitions 6-8% below their normal weight. The aim of this study was to estimate the effect of weight cutting by dehydration (sauna) and rehydration on technical skills of wrestling and to create or not create any difference in biomechanical terms; these differences in the degree of influence was investigated in dehydration (dry sauna) and rehydration. METHODS: These tests were performed in three phases: pre-test (without dehydration), post-test 1 (dehydration 3.5%), and post-test 2 (18 hours after rehydration). Thirteen experienced and elite wrestlers who had been training for eight years participated as subjects (age 18.38 +/- 1.32 years, height 1.70 +/- 0.04 m; body mass 71.11 +/- 11.80 kg). Reflective body markers were attached to all of the subjects' joints, and they performed single-leg takedowns in front of three cameras (Hero 3, 15fps/1440 p). Three-dimensional motion analysis methods that measured linear and angular kinematic characteristics were evaluated by Skillspector (1.3.2 Version) software. RESULTS: The results showed that rapid weight loss could affect elite wrestlers' skills and performance of single-leg takedown technique's linear and angular kinematics. Statistical analysis via the Parametric Repeated Measure Test showed significant differences between the single-leg takedown techniques. CONCLUSIONS: The finding demonstrated negative effects on shoulders, elbows, wrist, pelvises, knees' and ankles linear max velocity, position, and angular max velocity.

Mohammadi, M., & Hojjati, S. S. (2018). Investigation of the relationship between male young elite wrestlers' blood and salivary lactate densities through the application of noninvasive lactate threshold estimation method subsequent to the effectuation of stationary periodic wrestling-based exercises / Investigaç o da rela o entre o sangue de lutadores de elite de jovens do sexo masculino e as densidades de lactato salivar por meio da aplica o do m todo de estimativa do limiar de lactato n o invasivo ap s a realiza o de exerc cios peri dicos de luta livre estacion rios. *Revista Brasileira de Nutri o e Esportiva*, 12, 867-874.

Mohseninia, K. (2018). Wrestling Techniques. *International Journal of Wrestling Science & Sports*, 8(1), 88-92.

Morales, J., Ubasart, C., Solana-Tramunt, M., Villarrasa-Sapi a, I., Gonz lez, L., Fukuda, D., Franchini, E. (2018). Effects of rapid weight loss on balance and reaction time in elite judo athletes. *International journal of sports physiology and performance*, 1-21. doi:10.1123/ijsp.2018-0089

Balance, reaction time, and strength are key factors affecting judo performance. While ample research exists examining potential strength changes caused by weight loss prior to competition, changes in balance and reaction time, have been overlooked. Purpose: The objective of this study was to examine the effects of rapid and progressive weight loss (RWL and PWL) on balance, reaction time, and strength in a group of elite judo athletes. Methods: 38 female and male judo athletes (age = 20.6 ± 2.6 years) completed balance, reaction time, and strength assessments one week prior to an official weigh-in (pre-test) and immediately after the weigh-in (post-test). The judo athletes were divided into three groups, one control group who maintained regular training and eating habits, one experimental group who engaged in PWL (<3% reductions in body mass) and a second experimental group who used RWL techniques (>3% reductions in body mass). Results: RWL group showed significant decreases (p<0.05) in balance performance (Ellipse area: 4.83±0.87 vs. 6.31±1.39 mm<sup>2</sup> with eyes closed; Mean Mediolateral Velocity: 2.07±0.2 vs. 2.52±0.45 mms<sup>-1</sup> with eyes closed; Mean Anteroposterior Velocity: 2.25±0.20 vs. 2.51±0.32 mms<sup>-1</sup> with eyes open and 2.44±0.26 vs. 3.06±0.56 mms<sup>-1</sup> with eyes closed) and reaction time (0.38±0.04 vs. 0.42±0.06 seconds) with no changes in strength from pre- to post-testing. The judo athletes in the progressive weight loss and control groups maintained performance in all variables. Conclusion: These findings demonstrate negative effects on perceptual motor skill performance in judo athletes engaging in rapid weight loss strategies prior to competition.

Moskovchenko, O., Ivanitsky, V., Zakharova, L., Tolstopyatov, I., Kattsina, T., Redi, E., . . . Shubin, D. (2018). Morphofunctional markers of kinetic aptitude in a sport selection system. *Journal of Physical Education & Sport*, 18(2), 670-676.

In the article we study morphofunctional markers of sportsmen kinetic aptitude as one of the criteria for sport selection and sporting achievements prediction. The article contains various renderings of sport selection, shows its stages as a united system based on the hierarchy principle and targeted approach. It also extends different scientific views on the young people sporting aptitude detecting. The article reveals separate results of the diversified long-term research (1965-2016) on the issues of physical and training load optimization in athletes of various sports taking into consideration their constitutional type (morphofunctional marker). Experimental materials are proved by high sporting achievements of Greco-Roman wrestlers and speed underwater swimmers. The study broadens the scientific knowledge about the opportunities of athlete perspective determination by means of morphofunctional criteria (markers) not only in a particular sport, but at the stage of his specialization.

Mulyar V. I., M., B I]. (2018). Philosophical and educational concept of Plato / ФІЛОСОФСЬКО-ОСВІТНЯ КОНЦЕПЦІЯ ПЛАТОНА. *Philosophical and educational concept of Plato*. (131), 195-199.

The article actualises the philosophical and educational concept of Plato as one of the most prominent models of teaching and upbringing of the Greek society. The organic connection of the educational and philosophical views of Plato with his general philosophical doctrine, in particular, of reference prototypes, which are eternal and non-transformational, remaining perfect in all their manifestations, and therefore unattainable in their perfection for any of their own real, terrestrial, objective prototypes, is substantiated. Thus, the soul is substantiated as the eternal essence of the person and the process of human cognition as a reminder of the soul of what she saw when walking alongside God and ascended to true existence. In the essence of the philosophical and educational paradigm of Plato - the formation of a citizen of a perfect state as the cultivation of the highest virtues: wisdom, courage, restraint and justice; education and upbringing under the control of the state. The essence of kalokagathia as a moral beauty of a citizen of the ancient Greek society is revealed. Two main parts of education and upbringing: gymnastic and musical ones are highlighted. The role and place of dance and wrestling as the rods of gymnastic education, as well as the basic samples of musical education is uncovered. An exceptional state monopoly on education and upbringing, and therefore the class nature of the Platonic philosophical and educational concept is shown.

Murray, S. B., Accurso, E. C., Griffiths, S., & Nagata, J. M. (2018). Boys, biceps, and bradycardia: the hidden dangers of muscularity-oriented disordered eating. *Journal of Adolescent Health, 62*(3), 352-355.  
doi: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

Myagkova, M. A., Petrochenko, S. N., & Morozova, V. S. (2018). Detection of natural antibodies to endogenous bioregulators for the diagnostics of the functional state of the body. *Russian Chemical Bulletin, 67*(4), 762-767.  
doi:10.1007/s11172-018-2134-3

An immunological method for the detection of natural antibodies (NAb) to endogenous bioregulators ( $\beta$ -endorphin, orphanin, angiotensin, serotonin, dopamine, histamine,  $\gamma$ -aminobutyric acid (GABA), and glutamate) has been developed for the evaluation of the functional state of the human body. The antibody level was determined at various stages of exercises during the period of sport training. A relationship was established between the change in the NAb level and the increased training load or the duration of exercises. The difference in the NAb levels for athletes specializing in Greco-Roman wrestling, soccer, and hockey was established. The initially high values for orphanin, GABA, and glutamate were found in hockey players, while these indicators in wrestlers were dynamically increased during the training process. Immunological indicators for soccer players were close to the physiologically normal ones and were similar to the parameters of people engaged in sports and recreational gymnastics. It was demonstrated that the diagnostic tests for the detection of natural antibodies to the listed biomolecules could have a practical application to evaluate the effectiveness of the functional state of the human body.

Nishimaki, M., & Sakamoto, S. (2018). Effect of obesity-related gene polymorphisms on weight loss of female wrestlers. *Archives of Budo, 14*, 117-123.

Background and Study Aim: Many wrestlers undergo extreme dieting, with rapid weight loss and fluid restriction, to achieve rule weight as measured before a match. Insight into the genetics of weight loss has been gained from studies of patients with lifestyle-related diseases, including obesity and diabetes, who show weight loss resistance in the face of therapeutic interventions such as diet and exercise. However, the effect of single nucleotide

polymorphisms (SNPs) in obesity-related genes on the rapid weight loss that athletes experience in weight-class sports such as wrestling remains to be elucidated. The purpose of this study was the effect of SNPs in ADRB3, ADRB2, and UCP1 on rapid weight loss in female wrestlers. Material and Methods: Twenty-two female wrestlers who sought weight loss before a match participated in this study. We performed real-time polymerase chain reaction using a quenching probe to determine subject genotypes. Results: Thirteen subjects had the ADRB3 (Trp/Trp) wild-type genotype, whereas 9 had the ADRB3 (Trp/Arg) polymorphic genotype. Five subjects had the ADRB2 (Arg/Arg) genotype, and 17 had the ADRB2 (Arg/Gly) polymorphic genotype. Five subjects had the UCP1 (-3826A/A) genotype, and 17 had the UCP1 (-3829A/G) polymorphic genotype. No statistically significant associations were detected between genotypes of obesity-related genes with any of the weight loss indicators measured. Conclusions: SNPs in the obesity-related genes ADRB3, ADRB2, and UCP1 do not appear to affect weight loss in female wrestlers during rapid weight loss regimens prior to a match.

Noh, J. W., Yang, S. M., Kim, J. H., Lee, J. U., Kim, M. Y., Lee, L. K., . . . Kim, J. (2018). Somatotype analysis of Korean combat sport athletes based on weight divisions. *Archives of Budo, 14*, 169-178.

Background and Study Aim: It is well established that somatotypes are defined by the physical characteristics of the body. However, the somatotype results of Korean combat sport athletes have not yet been established. The purpose of study was the somatotype of Korean combat sport athletes based on body weight divisions and physical characteristics in relations the practice of training and sport rehabilitation. Material and Methods: This study consisted of 40 judo, 32 ssireum, 31 taekwondo (gyorugi), 20 taekwondo (poomsae), 23 boxing, and 13 wrestling elite athletes. The participants were divided into four weight divisions: light weight (-55 to -74 kg), middle weight (-75 to -94 kg), heavy weight (-95 to -114 kg), and super heavy weight (+ 115 kg). Somatotypes measurements were performed using a Heath and Carter's modified somatotype method. Results: Ssireum athletes had higher endomorphic and mesomorphic characteristic values and lower ectomorphic characteristics compared to other athletes. Somatotype component values for judo and wrestling athletes were similar. Gyorugi athletes had higher ectomorphic values than other athletes and were taller. Values of all components among the poomsae athletes were balanced. Boxing athletes had the same endomorphic and ectomorphic values and higher mesomorphic characteristic values. Differences between the sports were more significant in the lower-and middle-weight categories compared to the heavy-and super-heavy-weight categories. For all combat sports, higher weight divisions included higher endomorphic and mesomorphic values and lower ectomorphic values compared to lower weight categories. Correlations between endomorphic characteristics and body weight were significant among all athletes except for gyorugi athletes. Correlations between mesomorphic characteristics and body weight were significant among judo, ssireum, boxing, and wrestling athletes, but taekwondo athletes did not show any correlation. The correlation between ectomorphic characteristics and body weight were significantly negative among judo, ssireum, gyorugi, boxing, and wrestling athletes and negative among poomsae athletes. Conclusions: Almost all combat sport athletes have mesomorph body types except for taekwondo athletes, and the somatotypes of athletes were influenced by the type of sport and weight divisions. Therefore, injured or ahead-of-the-game elite combat athletes require different methods of rehabilitation and training based on sport type and body weight, and further studies are required to assist in proper training for athletes returning from injury and to aid in sport rehabilitation.

Nonga Nonga, J. B., & Bienvenu, B. (2018). Cameroonian Wrestlers at the Olympic Games and World Championships From 1980 to 2016. *International Journal of Wrestling Science, 8*(1), 83-87.

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 Cameroonian wrestlers participating in Olympic and world championships from 1980 to 2016 were identified through the use of the United World Wrestling (UWW) Database. The main results show 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).

Osipov, A. Y., Guralev, V. M., Kudryavtsev, M. D., Kamoza, T. L., & Kuzmin, V. A. (2018). Development of the ability to maintain body balance in dynamic conditions in beginning sambo wrestlers aged 11-12. *Human Sport Medicine, 18*(4), 88-94. doi:10.14529/hsm180413

Aim. The article deals with searching effective methods for the development of balance abilities and maintenance of body balance in young sambo wrestlers. Materials and methods. 28 young sambo wrestlers aged 11-12 participated in the study. All wrestlers belong to weight categories of 46 and 50 kg. The study lasted 1 year. In the training of wrestlers from the experimental group we introduced sets of exercises, contributing to the development of balance abilities and maintenance of body balance. Wrestlers performed these exercises at least 20 minutes during each lesson. To assess balance abilities in static and dynamic conditions, we used the following tests:

Stork, balance maintenance on an unstable surface (Board), movement test with rolls, certain wrestling elements (one leg throw). We performed statistical processing of the results using Mann-Whitney U-test. Results. Stroke and Board tests did not reveal any significant differences between groups. In dynamic tests (rolls, throws), we revealed a significant ( $p < 0.01$ ) difference in the experimental group. Conclusion. The study demonstrates that targeted exercises may influence substantially the development of balance abilities in young sambo wrestlers. To achieve positive results, it is necessary to perform these exercises at least 20 minutes every day.

Paiziev, A. (2018). Dorsiflexor Muscle Oxygenation During Isometric Contraction. *International Journal of Wrestling Science*, 8(2), 43-48.

Sustained isometric contractions of skeletal muscles produce intramuscular pressures that leads to blood flow restriction. In result an active muscle sustains deficit of oxygen and muscle fatigue. On another side during exercise we have physiological contradiction between raising of oxygen demand by working muscle and restriction of blood flow due to vessel pressing. To clarify this issue much research has been performed based mainly on measurement of blood flow in muscle tissue. The purpose of this study was to assess real-time changes in muscle oxygenation during a sustained isometric contraction of the dorsiflexor muscle with low (30%), moderate (60%) and submaximal (90%) intensity. Experiments were conducted using the subject's dominant leg. Volunteers were recruited from eight male students of USIPC (age:  $19 \pm 2$  years, weight:  $75 \pm 6$  kg). Tissue oxygenation index (StO<sub>2</sub>) were recorded from the tibialis anterior using Near-infrared spectroscopy (NIRS) device (Nonin Medical Inc, Plymouth, Minnesota, USA). Saturation was higher at 30% compared with both 60% and 90% MVC at all time points after the start of exercise and higher at 60% than 90%. Oxygen consumption (VO<sub>2</sub>) permanently increased from slow (30%) to moderate (60%) and submaximal contractions. After cessation of each contraction there was a large and immediate hyperemic response. Rate of StO<sub>2</sub> increase after effort cessation reflects the resaturation of hemoglobin which depend on integrity and functionality of the vascular system and reflects blood vessel vasodilation. StO<sub>2</sub> resaturation rate permanently increased from slow (30%) to moderate (60%) and submaximal contractions. At last in final stage of the experiment arterial occlusion test was performed to determine the minimal oxygen saturation value in the dorsiflexors. Oxygen saturation reached  $24 \pm 1.77\%$  and was significantly higher than StO<sub>2</sub> after 60 and 90% MVC. It can be concluded that oxygen saturations at 60% and 90% MVC are similar and sharply decreased after the start of exercise. It means that after a 60% MVC takes place, there is an occlusion of blood vessels due to intramuscular pressure. Oxygen consumption of active muscle increased depending on the intensity of exertion according to increasing of oxygen demand. StO<sub>2</sub> resaturation rate (RE) permanently increased from slow (30%) to moderate (60%) and to submaximal contractions. The RE increase after exercise cessation reflects the resaturation of hemoglobin, which depends on the integrity and functionality of the vascular system and reflects blood vessel vasodilation.

Papassotiriou, I., & Nifli, A.P. (2018). Assessing performance in pre-season wrestling athletes using biomarkers. *Biochemia Medica*, 28(2), 1-11. doi:10.11613/BM.2018.020706

Introduction: Although regular training introduces the desired changes in athletes' metabolism towards optimal final performance, literature is rarely focusing on the metabolic responses off-competition. Therefore, the aim of this study was to evaluate biochemical indices during typical preseason training in wrestling athletes. Materials and methods: Twenty male freestyle and Greco-roman wrestlers (14 to 31 years) followed a typical session of the preparatory phase. Capillary blood glucose and lactate concentrations were assessed immediately before and after training. Protein, microalbumin, creatinine and their ratio were estimated the next day in the first morning urine. Results: Pre-training lactate concentrations were lower in Greco-roman than in freestyle wrestlers ( $1.8 (1.4 - 2.1)$  vs.  $2.9 (2.1 - 3.1)$  mmol/L). Exertion resulted in a significant increase in lactate concentrations, by  $3.2 (2.6 - 4.1)$  mmol/L in Greco-roman wrestlers and  $4.5 (3.4 - 5.3)$  mmol/L in freestylers. These changes were found to correlate with athlete's sport experience ( $r_s = 0.71$ ,  $P < 0.001$ ). Glucose concentrations were also significantly increased by  $0.5 (0.1 - 0.8)$  mmol/L, in correlation with lactate change ( $r_s = 0.49$ ,  $P = 0.003$ ). Twelve subjects exhibited urine albumin concentrations at 30 mg/L, and thirteen creatinine concentrations around 17.7 mmol/L. The corresponding ratio was found abnormal in 4 cases, especially when creatinine excretion and body fat were low. Conclusions: Wrestling training is associated with mobilization of both lactic and alactic anaerobic energy systems. The regular comprehensive monitoring of biochemical markers would be advantageous in determining the efficiency of the preparatory phase and the long-term physiological adaptations towards the competition phase, or athlete's overtraining

Polat, S. C., Bulgay, C., Yarim, I., Cicioglu, H. I., & Cetin, E. (2018). Analysis of the Relationship between Elite Wrestlers' Leg Strength and Balance Performance, and Injury History. *Sports*, 6(2), 6. doi:10.3390/sports6020035

The purpose of this study is to examine the correlation between leg power and balance performance in elite wrestlers and injury history. In the research group, there are 18 elite freestyle male wrestlers at the ages of  $24.27 \pm 3.18$  years, with a height of  $171.86 \pm 5.44$  cm and a body weight of  $79.27 \pm 11.16$  kg. Information on the injury history of the athletes' upper legs for the past year was collected via interviews with the club's physiotherapist. Laboratory tests to measure performance assessed height, body weight, Y balance and isokinetic

leg strength. Data obtained from the study are presented as mean and standard deviation. The test of normality was carried out by the Shapiro-Wilk test. The Pearson Correlation Test was performed for all parameters with normal distribution, and significance level was accepted as  $p < 0.05$ . It was found that there is a relationship between the wrestlers' right leg ratio and hamstring strength and injury history. However, there is no statistically significant relationship between left leg hamstring, quadriceps, ratio, right leg quadriceps, or right and left leg balance performance, and injury history. The resulting data shows that the proportioning between hamstring and quadriceps muscles in freestyle wrestlers' upper leg strength values is not ideal. This finding provides evidence that injury risk increases with the additional impact of loss of strength.

- Polat, S. C., Cetin, E., Yarim, I., Bulgay, C., & Cicioglu, H. I. (2018). Effect of Ballistic Warm-up on Isokinetic Strength, Balance, Agility, Flexibility and Speed in Elite Freestyle Wrestlers. *Sport Mont*, 16(3), 85-89.  
The aim of this study is effect of ballistic warm-up on isokinetic strength, balance and some parameters in male elite freestyle wrestlers. Thirteen elite freestyle wrestlers at the age of  $20.15 \pm 2.11$  yrs, with  $174.54 \pm 7.14$  cm height and  $81.67 \pm 15.36$  kg weight participated in the study. Measurements were performed two different warm-up protocols. Running protocol at submaximal level on the treadmill for 10 minutes was applied for every wrestler. Ballistic Warm-up protocol involved 13 different movements for multi-muscle groups lasting for 10 minutes. Flexibility, speed, agility, balance, hand grip and isokinetic leg strength parameters were measured. Wilcoxon Signed Rank test was performed to find the difference between the protocols. Consequently, differences were found in flexibility, right hand grip strength, right posteromedial and posterolateral balance, left posteromedial and posterolateral balance, left and right hamstring and quadriceps strength parameters. Ballistic warm-up protocol can be more effective in many parameters, especially strength compared to ordinary warm-up.
- Pons, V., Riera, J., Capó, X., Martorell, M., Sureda, A., Tur, J. A., . . . Pons, A. (2018). Calorie restriction regime enhances physical performance of trained athletes. *Journal of the International Society of Sports Nutrition*, 15, 1-1.  
Background: Caloric restriction induces mitochondrial biogenesis and improves physical fitness in rodents. We aimed to provide evidence of how caloric restriction affects the body composition and physical performance of trained athletes and to evaluate the possible impact of an every-other-day feeding diet on nutritional deficiencies of micronutrients and essential fatty acids. Methods: The study was performed with 12 healthy male athletes by carrying out a 33% caloric restriction with respect to their usual diet. Athletes performed a maximal exercise stress test both before and after the caloric restriction period. Blood samples were taken before and after the caloric restriction at basal conditions and 30 min post-exercise. Although energy intake was reduced by about 33%, the contribution of carbohydrates, proteins, and lipids to total energy intake during the caloric restriction was similar to the original diet. Results: The caloric restriction reduced the daily specific micronutrient intake to values lower than 90% of recommended dietary allowances. No effects were observed in blood parameters related to iron metabolism and tissue damage, glucose levels, lipid profiles, or erythrocyte fatty acid composition. In addition, oxidative damage markers decreased after the nutritional intervention. The caloric restriction intervention significantly reduced body weight and trunk, arm, and leg weights; it also caused a decrease in fat and lean body mass, the energy expenditure rate when performing a maximal exercise stress test, and the energy cost to run one meter at various exercise intensities. Furthermore, the intervention ameliorated the onset of the anaerobic phase of exercise. Conclusion: A caloric restriction improves athletes' performance and energy efficiency, but reduces the daily intake of micronutrients; so, when caloric restriction programs are implemented micronutrient supplementation should be considered.
- Rahmani, A., & Mirzaei, B. (2018). The Acute Effects of Resistance Exercise with Blood Flow and Respiratory Restriction on Blood Lactate and Growth Hormone in Collegiate Wrestler. *International Journal of Wrestling Science*, 8(2), 30-35.  
Resistance activity with new methods of exercise such as blood flow and respiration restriction has been performed at a lower intensity in pursuing various physiological responses. The main purpose of this research was to study the effect of blood flow and respiratory restriction on blood lactate concentration and growth hormone in the acute response to resistance exercise in collegiate wrestlers. A counter- balanced design was used in which 8 collegiate wrestlers (mean age  $26.87 \pm 4.7$  years and body mass index  $25.26 \pm 2.49$  kg/m<sup>2</sup>) were randomly assigned in three conditions including: control (80%1RM) and resistance exercise with blood flow and respiratory restriction (30%1RM). Four sets of squats were used as the resistance exercise. Blood samples were collected before and immediately after exercise. The data were analyzed by repeated measure ANOVA using SPSS software (version 19) with a significance level of  $p < 0.05$ . All three types of exercise caused a significant increase in lactate and growth hormone immediately after the exercise, but no significant difference was observed between the groups. The results of this study indicated that resistance exercise with restriction of blood flow and respiration can lead to increased metabolic and hormonal responses. This research also confirms the effectiveness of this type of exercise and satisfies the goals expected from high intensity exercises.
- Reale, R., Slater, G., & Burke, L. M. (2018). Weight Management Practices of Australian Olympic Combat Sport Athletes. *International Journal of Sports Physiology & Performance*, 13(4), 459-466.

Purpose: Combat sport athletes undertake chronic and rapid weight loss (RWL) practices to qualify for weight divisions lower than their training weight. Variation between sports in the prevalence, methods, and magnitude of weight loss as well as recovery practices may be influenced by factors including competition level and culture. Differences in methodologies of previous research in combat sports make direct comparisons difficult; thus, this study aimed to examine weight loss practices among all Olympic combat sports in Australia, using standardized methodology. Methods: High-caliber competitors in wrestling, boxing, judo, and taekwondo (n = 260) at Australian competitions were surveyed using a validated tool that provides quantification of how extreme an athlete's weight loss practices are: the rapid weight loss score (RWLS). Additional qualitative and quantitative survey data were also collected. Results: Neither sport, sex, nor weight division group had an effect on RWLS; however, a significant effect of athlete caliber was detected ( $F_{2,215} = 4.953$ , mean square error = 4.757,  $P = .00792$ ). Differences between sports were also evident for most weight ever lost in order to compete ( $H = 19.92$ ,  $P = .0002$ ), age at which weight cutting began ( $H = 16.34$ ,  $P = .001$ ), and selected methods/patterns of RWL ( $P < .001$ ). Weight cycling between competitions was common among all sports as were influences on athlete's behaviors. Conclusions: Although many similarities in weight loss practices and experiences exist between combat sports, specific differences were evident. Nuanced, context/culturally specific guidelines should be devised to assist fighters' in optimizing performance while minimizing health implications.

Rizzo, N. (2018). Post-Pubertal Transitioned Male-to-Female Transgender Athletes in Professional Combat Arts Sports: Athletic Advantage or Not? *International Journal of Wrestling Science*, 8(1), 13-21. Much has been written about transgender athletes in combat sports recently, particularly in MMA. In this literature, there are two primary questions. 1) Does a post-pubertal male-to-female transgender athlete have an advantage in combat sports? 2) When considering transgender participation in sports, should combat arts be considered different than other sports?

Robertson, P. J., Callan, M., Nevison, C., & Timmis, M. A. (2018). Is visual search strategy different between level of judo coach when acquiring visual information from the preparation phase of judo contests? *International Journal of Sports Science & Coaching*, 13(2), 186-200. Judo contests are complex situations for coaches observing them. Identifying where judo coaches look (i.e. their visual search strategy) when observing contests can help identify visual information they may use to inform coaching decisions. The current exploratory study investigated the visual search strategies of elite, sub-elite, and non-judo coaches when observing the preparation phase (viewed from video footage) of elite-level judo contests. Participants' eye movements were recorded using a mobile eye-tracker. Participants were instructed to provide verbal coaching instructions to improve a specified judoka's (judo athlete) performance at set times during the footage. Elite coaches fixated significantly more frequently and longer on the specified judoka's upper body ( $p < 0.05$ ) compared to the opponent's upper body and other key areas within the display. Sub-elite and non-judo coaches demonstrated no significant difference in the frequency or overall length of fixation between the judokas' upper bodies. The visual search strategy of elite judo coaches may have been a purposeful attempt to obtain accurate information about the judoka's attacking intentions early within the contest. This visual search strategy can be attributed to elite judokas' attempting to disguise their attacking intentions. Furthermore, elite coaches may have used the specified judoka's upper body as a visual pivot.

Rossi, A., Claiborne, T., & Fetter, J. (2018). Preventing Sudden Death in a Competitive Athlete: A Case Report. *International Journal of Athletic Therapy & Training*, 23(3), 124-127. A 19-year-old male collegiate wrestler was diagnosed with bicuspid aortic valve disease and aortic insufficiency due to the presence of an aortic-ventricular tunnel. The athlete underwent an electrocardiogram, transthoracic echocardiogram, transesophageal echocardiogram, as well as a diagnostic ultrasound of his carotid arteries and abdominal aorta in order to diagnose this underlying structural abnormality. This diagnosis resulted in the athlete being disqualified for the remainder of the wrestling season and undergoing open-heart surgery to repair his bicuspid aortic valve. This case study will explain the events surrounding the recognition of this disease as well as advocate for the use of cardiac screening in preparticipation exams (PPEs). It is imperative that we implement more advanced diagnostic testing in the PPEs of young athletes in order to diagnose underlying structural heart abnormalities that may lead to sudden cardiac death.

Ruggiano, J. (2018). Wrestling diplomacy: how one sport is teaching the world how to fight for unity. *International Journal of Wrestling Science*, 8(1), 1-3.

SanloğLu, A., Taniş, Z. S., Akandere, M., Ülker, M., KocaoğLu, Y., & Pektaş, N. A. (2018). The relationship between anxiety and life satisfaction in the U23 category wrestlers. *Ovidius University Annals, Series Physical Education & Sport/Science, Movement & Health*, 18, 240-245. Objectives: In this study, it was aimed to examine the relationship between the anxiety and life satisfaction of the wrestlers of the national team level in the U23 category. Method of research: A total of 100 national male



wrestlers volunteered to participate in the survey, including 50 Greco-Roman styles and 50 Freestyle styles, which involved participants in the national team level. Continuous anxiety scale and life satisfaction scale were applied to the subjects in the survey. A correlation analysis was used to determine the relationship between participants' level of trait anxiety and life satisfaction, and independent sample t test was used in intergroup comparisons. Results: There was no statistically significant relationship between life satisfaction and trait anxiety levels of the participants ( $r = 0,164$ ,  $p = 0,101$ ). According to the analysis result, T-Test there was no statistically significant difference between the average of the GrecoRoman wrestlers and the free style wrestlers' continuous anxiety ( $t(97.195) = 1.797$ ,  $p = 0.563$ ) ( $t(92.637) = -2.259$ ,  $p = 0.026$ ) were found to be higher than the free stille with the scores of GrecoRoman life satisfaction of the wrestlers. Conclusion: As a result, in studying the relationship between the anxiety and the life satisfaction of the wrestlers of the national team level in the U23 category, it was seen that the life satisfaction of the GrecoRoman wrestlers were higher than the free style wrestlers, where the trait anxiety levels of participants were similar. A

Saryg, S. K., Lopsan, A.D., & Buduk-ool, L.K. (2018). Tuvan junior males' heart rhythm control specifics under variable physical loads. ОСОБЕННОСТИ РЕГУЛЯЦИИ СЕРДЕЧНОГО РИТМА ТУВИНСКИХ ЮНОШЕЙ С РАЗЛИЧНОЙ ДВИГАТЕЛЬНОЙ АКТИВНОСТЬЮ ПРИ ФИЗИЧЕСКОЙ НАГРУЗКЕ. / *Teoria i praktika fiziceskoj kul'tury*(1), 49-52.

The study analyses the Tuvan junior males' (17-21 years old) heart rate variability data versus varied physical workloads. High education and training workloads were profiled versus the environmental, anthropometrical, psychic, physiological and ethnic factors and specifics that give the reasons to consider the study innovative. The study sample was dominated by the junior males classified with Autonomic Control Types (ACT) I and III. The ACT I junior males were tested with generally lower variations in the cardiovascular system test rates versus the ACT II juniors. The high physical workloads were responded by the sample by the autonomous control strengthening and growing activity of the central control contour with the further growth of the workload. Physically inactive junior group responded to the workloads (regardless of the load factor), by growing activity of the central control contour that may be interpreted as the unspecific component of the adaptive response to different stressors. The ACT I/ II junior males engaged in body conditioning practices, ACT III volleyball players and ACT I/ III wrestlers were tested with fairly high HR variability. The body conditioning junior group and ACT I wrestling group was tested with the increased adaptive abilities; and the volleyball players and physically inactive juniors were tested with the HR variability within the conditional norm. The body conditioning group, volleyball group and ACT III wrestling group were tested with notably increased adaptation abilities; and the physically inactive junior group was tested with a vegetative imbalance as a result of the high physical loads.

Sasaki, M., Asamoto, S., Umegaki, M., & Matsumoto, K. (2018). Cervical osteogenic degeneration in Japanese professional wrestlers and its relationship to cervical spine injury. *Journal of Neurosurgery-Spine*, 29(6), 622-627. doi:10.3171/2018.5.spine18283

OBJECTIVE This study aimed to investigate the characteristics of cervical degeneration in Japanese professional wrestlers and its relationship with the risk of cervical spine injury (CSI). METHODS Since 2012, 27 Japanese male wrestlers belonging to a professional wrestling association have undergone periodical medical examinations of the cervical spine. If neurological symptoms were observed in the wrestlers, the resident trainers urged them to undergo a brief examination at the authors' institutions. In addition to this prospective research study, the mechanisms of the CSIs that occurred in 5 wrestlers, including 2 with CSI before 2012 and 3 who were independent from the professional wrestling association, were retrospectively investigated by reviewing the circumstances of the injury and the wrestlers' imaging studies. RESULTS The mean age of the wrestlers was 36.9 years (range 23-56 years) at the initial examination. An anterior giant ossifying lesion (AGOL) was observed in the anterior aspect of the cervical spine of 11 wrestlers (41%). The AGOLs tended to grow and spread to multiple spinal levels as the wrestlers aged. Of the 12 wrestlers with osteogenic lesions, 10 older than 40 years of age (83%) had an AGOL, which is frequently accompanied by osseous spinal canal stenosis. Two wrestlers presented with spinal cord compression with intramedullary intensity change on MRI. However, during the follow-up period, no spinal cord injury (SCI) occurred in the wrestlers, although thoracolumbar injury occurred in 2 wrestlers during a match. In examining the 5 wrestlers with CSI, the injury occurred at the spinal levels without an AGOL. The most frequent pathology of CSI (60%) was SCI at the spinal level adjacent to the multilevel AGOL. CONCLUSIONS AGOL is a peculiar cervical degeneration of Japanese professional wrestlers, especially in aged wrestlers. The AGOL appears to be a biological reaction to reinforce the anterior aspect of the cervical spine of professional wrestlers, who routinely defend themselves in a flexed neck posture against their opponent. The present results suggest that the risk of CSI is not increased by spinal canal stenosis accompanied by AGOL. Further studies are needed to investigate the relationship between the wrestlers' cervical degeneration and the risk of CSI in more detail.

Savranbaşı, R. (2018). In Memorium: A Tribute to Daniel Robin. *International Journal of Wrestling Science*, 8(2), 49-50.

Sawyer, T. H. (2018). Female Wrestler Fights for Gender Equality. *Interscholastic Athletic Administration*, 44(3), 51-51.

Sawyer, T. H. (2018). Wrestler's Sign Language Interpreter Denied Access to Wrestling Circle. *Interscholastic Athletic Administration*, 44(4), 47-47.

Sharma, D., & Malhotra, I. (2018). Deconstructing Gender Binaries: Representations in Select Bollywood Movies. *Language in India*, 18(4), 49-64.

The present paper examines a paradigm shift in the stereotypical gender roles in two Bollywood movies, focusing upon their deconstruction of gender binaries. NH10 traces the evolution of a professional independent woman who after the death of her husband takes the "agency" into her hands and becomes an agent of change. She not only avenges the murder of her husband but also tries to bring justice in the highly regressive patriarchal rural setup. Dangal deals with the real life story of Phogat family, a family of wrestlers belonging to Haryana, India. It presents the successful attempt made by Mahvir Singh Phogat, a masculine man. Breaking the gender stereotypes, he trains his daughters in a masculine game, wrestling. The paper will analyse how sex, gender and sexuality may be popularly perceived as joined, but they are "politically textualized and constructed." It will make an attempt to use Judith Butler's theory of "Undoing Gender" to break the artificial binaries and to further establish that sex, gender and sexuality is a construction and is not stable.

Sholdubanov H. Yu. [Шолдубанов, Х. Ю. (2018). The study of the functional indicators of wrestlers after various loads. / ИССЛЕДОВАНИЕ ФУНКЦИОНАЛЬНЫХ ПОКАЗАТЕЛЕЙ ПОСЛЕ РАЗЛИЧНЫХ НАГРУЗОК. *GILEYA*(132), 308-311.

The article covers preparation of wrestlers training load and etc. in wrestling.

Silva, V., Dias, C., Corte-Real, N., & Fonseca, A. M. (2018). Mental toughness in Judo: perceptions of coaches / Características de força psicológica no Judo: percepções de treinadores. *Revista de Artes Marciales Asiáticas*, 13(1), 1-19.

The aim of this research was to explore coaches' perceptions about mental toughness characteristics in competitive Judo, in light of current single-sport mental toughness literature. Nine Portuguese Judo coaches from different levels of achievement (non-elite, subelite and elite) were interviewed. The protocol used for semi-structured interviews was based on Personal Construct Psychology "sociality" and "dichotomy" corollaries (Kelly, 1991). A total of 162 verbatim transcribed pages resulted as raw data. Properties and dimensions of the conceptual categories emerged from the data. Inductive content analysis revealed 22 attributes of mental toughness. Only eight were mentioned by all participants: resilience, self motivation, self-confidence, self-improvement, work discipline, attention regulation, emotional regulation and competitiveness. In reference to previous researches exploring mental toughness on a single sport, our results in Judo reinforced large similarities across sports. However, slight differences were discussed in relation to three mental toughness characteristics not previously identified in literature: combativity, self-esteem and adaptability. In addition, other attributes were found to be peculiar to Judo, but not exclusive, due to its form of expression: tactical awareness, combativity and self-presentation regulation. Combativity was the only attribute that stood out as being rather peculiar to Judo.

Silvey, D., Buote, R., Janes, I., Donovan, C., & Dubrowski, A. (2018). Peer Review: The Impacts of an Olympic Wrestling Program on the Academic Achievements, Physical Health and Overall Well-being of a 13- Year-Old Indigenous Youth. *Physical & Health Education Journal*, 84(1), 4-4.

Youth living in Indigenous communities across Canada have shown to have lower levels of physical health and wellbeing than their non- Indigenous peers. An expanding body of research suggests that physical activity can have a positive impact on physical health and overall wellbeing. This case study was designed as a view into the change evident in one young woman (age 13) during her journey through an Olympic wrestling program implemented in her Indigenous community. Several tests were conducted with the participant, along with an interview with the participant & the participant's guardian and a review of her school physical education grades. The interview focused primarily on how participation has impacted the youth's life. Results suggest that increases in physical activity through participation in the Olympic wrestling program has led to improvements in physical education grades, physical and, as it appears, overall wellbeing. Findings may be helpful to Indigenous communities who wish to start their own programs and to other professionals interested in working in these sport environments.

Şirinyeliz, E., & Döşyılmaz, E. (2018). Analyzing loneliness and life satisfaction of wrestlers registered to Turkey Olympic preparation center / TÜRKİYE OLİMPİYAT HAZIRLIK MERKEZİ (TOHM PROJESİ) KAPSAMINDAKİ GÜREŞÇİLERİN YALNIZLIK VE YAŞAM DOYUMLARININ İNCELENMESİ. *Journal of Physical Education & Sports Science / Beden Eğitimi ve Spor Bilimleri Dergisi*, 12(2), 119-127.

The aim of this study is to identify the loneliness and life satisfaction of wrestlers registered to Turkey Olympics Preparation Center (TOPC Project) and understand how it is affected by demographic variables. Data collected from 40 wrestlers selected from various cities of Turkey and already being trained in Olympics preparation center.

During the collection of research data; "UCLA Loneliness Scale" which developed by Russell, Peplau & Cutrona (1980)) and translated into Turkish by Demir (1989), and ""The Satisfaction Scale" which developed by Diener, Emmons, Larsen and Griffin (1985) and translated into Turkish by Yetim (1991) were used. T-test and ANOVA analysis used to understand how loneliness and life satisfaction level of these sportsmen changes according to some demographic variables. To understand the relation between sportsmen loneliness and life satisfaction levels, Pearson correlation analysis is used. The results show that, loneliness and life satisfaction of sportsmen have no statistically significant difference with education, marital status, family type, age, birth place, date of performing sports variables; while statistically significant difference found between the achievements of sportsmen and loneliness and life satisfaction. Positive and medium level relation found between loneliness and life satisfaction. According to the findings of the analysis, loneliness level of wrestlers contributed to the study is found to be medium, while life satisfaction level is high.

Slimani, M., Paravlic, A. H., Chaabene, H., Davis, P., Chamari, K., & Cheour, F. (2018). Hormonal responses to striking combat sports competition: a systematic review and meta-analysis. *Biology of Sport*, 35(2), 121-136.

Striking combat sports are challenging, commonly stressing the endocrinological system based on a mixture of body-contact actions and physiological efforts. The aims of this systematic review and meta analysis were to discuss the hormonal responses related to striking combat sports competitions and to investigate the moderator and mediator variables of the hormonal response-competition/outcome relationship. Three electronic databases (i.e., PubMed, Google Scholar and ScienceDirect) were systematically searched (up to February 2016) followed by a manual search of retrieved papers. The data showed a moderate increase in cortisol (C) (ES = 0.79; 95% CI 0.31-1.28;  $p = 0.001$ ), an extremely large increase in adrenaline (ES = 4.22; 95% CI 2.62-5.82;  $p < 0.001$ ), and a very large increase in noradrenaline (ES = 3.40; 95% CI 1.03-5.76;  $p = 0.005$ ) and human growth hormone (HGH) levels (ES = 3.69; 95% CI 1.96-5.42;  $p < 0.001$ ) immediately following the combat events, compared to the control condition i.e., "pre-combat". Furthermore, amateur athletes had a larger increase in C levels compared to highly trained athletes (ES = 2.91 [very large] vs ES = 0.56 [small]), while evening events showed greater alterations in C levels compared to morning events (ES = 1.91 [large] vs ES = 0.48 [small]), without significant differences between them ( $p = 0.26$  and  $p = 0.06$ , respectively). The present meta-analysis also showed a small, insignificant increase in testosterone (T) (ES = 0.47 [small]; 95% CI -0.45-0.99;  $p = 0.074$ ) and a decrease in insulin-like growth factor 1 levels (ES = -0.20 [trivial]; 95% CI -0.78-0.37;  $p = 0.486$ ) immediately following the combat events, compared to the control condition. The type of combat sports practised, participants' gender, and the nature of competition contests (i.e., official vs simulation) did not moderate the relationship between competition and hormonal response. Additionally, sub-analysis results showed a significant difference between younger and older athletes ( $Q = 4.05$ ,  $p = 0.044$ ), suggesting that after combat, younger individuals (less than 17 years of age) had a small decrease in T levels (ES = -0.58), compared with the moderate increase observed in older individuals (ES = 0.76). In conclusion, irrespective of striking combat sports types, the results showed that both official and simulated bouts are a real stressor of the hormonal system of practitioners. Coaches and applied practitioners should adopt "pre-competitive cognitive/coping strategies" to improve the psychological state that mediates the hormonal changes-competition/outcome relationship of their athletes in order to mitigate athletes' stress.

Slimani, M., Znazen, H., Sellami, M., & Davis, P. (2018). Heart rate monitoring during combat sports matches: a brief review. *International Journal of Performance Analysis in Sport*, 18(2), 273-292.

The aims of the present short review were to (i) summarise data relating to the heart rate (HR) response to combat sports matches according to many factors and (ii) determine the cardiovascular demand and intensity of combat sports matches. The present review shows that HR increased significantly across rounds during male taekwondo, boxing and kickboxing matches. HR and maximal heart rate (HRmax) increased significantly across successive karate and judo combat matches in young men and boy athletes. It has also been shown that there are no significant differences between winners and losers and males and females in HR response during official and simulated striking combat sports matches. Furthermore, combat HR intensity as a percentage of HRmax varied from 90% to 94%, from 86% to 100%, from 83% to 94%, and approximately 95% during judo, taekwondo, karate and Muay Thai matches, respectively. Coaches, sports scientists and athletes can also use HR to (i) assess athletes' cardiovascular demand and (ii) monitor exercise intensity during combat sports matches.

SYBIL, M., PERVACHUK, R., ZAHURA, F., STELMAKH, Y., BODNAR, I. (2018). Considering the current balance between lactate and alactate mechanisms of energy supply in preparation of free style wrestlers *Journal of Physical Education and Sport*, 18(Supp 4), 1826-1830.

The effectiveness of the method of permanent correction of individual training of skilled freestyle wrestlers considering the current balance between the individual components of anaerobic mechanism of energy supply have been experimentally justified. The base of the author's program is composed of the ratio between the indexes of biochemical monitoring (excretion of creatinine and lactate) during the pedagogical experiment in response to cycle ergometry "Vita maxima" and specialized check-up tests. The correction factor was to identify the individual balance between the lactic and alactic components of anaerobic energy supply, and to organize

influence with appropriate exercises on the weaker link by involving the cluster analysis.

Sybil, M., Pervachuk, R., Zahura, F., Shandrygos, V., Yaremenko, V., & Bodnar, I. (2018). Biochemical changes in cluster analysis indicators as a result of special tests of freestyle wrestlers of alactic and lactate types of power supply. *Journal of Physical Education & Sport*, 18(1), 235-238.

The paper presents a pattern of alactic, lactic and mixed types of freestyle wrestlers identified using the cluster analysis (computer application SPSS Statistic 17) of biochemical parameters growth of alactic (creatinine) and lactic (lactic acid) anaerobic energy supply mechanisms in response to specific check tests. The study involved 20 freestyle wrestlers with classification from I degree to Master of Sports (3-8 years of experience in training). It has been established that 3 athletes belong to alactic, 6 to lactic and 11 athletes to mixed types, which made it possible to customize the training program.

Tavares, L. D., Zanchetta, F., Lasevicius, T., Anorato, A., De Souza, E. O., Laurentino, G. C., & Franchini, E. (2018). Optimal load for the muscle power profile of prone bench pull in Brazilian Jiu-Jitsu athletes. *Sport Sciences for Health*, 14(1), 143-149.

Background: No studies were observed optimal intensity loads for the muscle power performance during prone bench pull exercise in Brazilian Jiu-Jitsu athletes (BJJ) and this exercise is more similar with grip technics.

Purpose: To identify the optimal intensity for the muscle power performance variables during PBP exercise in BJJ athletes. Methods: Fifteen athletes ( $25.5 \pm 4.9$  years;  $65.6 \pm 12.2$  kg;  $177.5 \pm 4.7$  cm) performed PBP at 30, 40, 50 and 60% of one repetition maximum (1RM) in a random order. The mean power (MP), mean velocity (MV), mean propulsive power (MPP) and mean propulsive velocity (MPV) were determined by measuring the barbell displacement by a linear encoder. Results: In all power performance variables, higher power output was observed at 40 and 50% 1RM when compared to 30 and 60% 1RM (MP:  $F < 29.07$ ;  $p < 0.001$ ; MV:  $F = 40.80$ ;  $p < 0.001$ ; MPP:  $F = 53.69$ ;  $p = 0.003$ ; MPV:  $F = 166.2$ ;  $p > 0.001$ ). Additionally, it was observed higher MPP at 50% 1RM when compared to 40% 1RM ( $F < 55.23$ ;  $p < 0.001$ ). The polynomial adjustment indicated that the optimal intensity load for producing highest power performance ranged from 45 to 50% 1RM ( $R^2 = 0.938-0.989$ ) across all variables. Conclusion: The loads between 45 and 50% 1RM produced the optimal muscle power performance during PBP exercise in BJJ athletes.

Thomas, R. E., & Zamanpour, K. (2018). Injuries in wrestling: systematic review. *Physician and sportsmedicine*, 46(2), 168-196. doi:10.1080/00913847.2018.1445406

Objectives: To identify all studies of injuries in wrestling, assess risk of bias and compute weighted average injury rates. Methods: 17 online databases and nine grey literature resources were searched with no language/date limitations. Abstracts were assessed for inclusion and data abstracted independently by two reviewers. Results: Eleven studies of competitions, 27 databases, four surveys (699 wrestlers) and seventeen case reports (604 cases) were included. Studies provided varying completeness of data. Weighted average injury rates of 16.3/1000AE (AE=Athletic encounter) could be computed for 8/11 studies of competitions and 69.5/1000AE for 5/27 databases. Eleven of the databases focused on specific injuries. Weighted average injury rates by location for 8/11 competition studies and 7/16 databases were similar for the upper extremities (competitions 26%, databases 24%) and torso (15%, 12%), but dissimilar for head/neck (31%, 20%) and lower extremities (24%, 39%). Weighted average injury rates by injury type varied from 6/11 to 2/11 competition studies and 6/16 to 3/16 database studies. Percentages were similar for fractures (6%, 7%), dislocations/subluxations (6%, 6%), ligament tears/cartilage injuries (12%, 17%) and concussions/1000AE (2 competition studies, 1 database) in competitions (25%, 27%) and training (5.7%, 7.1%). Percentages were dissimilar for lacerations/abrasions/contusions (23%, 4%) and sprains/strains (38%, 26%). The differences may be due to the small number of databases providing specific data and the unknown proportion of training injuries. Databases extrapolating injuries to the national US level reported high annual numbers. Conclusions: Average injury rates weighted by sample size are 16.3/1000AE for 8/11 competition studies and 69.5/1000AE for 5/27 databases. Competition data are likely to be accurate because they were observed by physicians, trainers and referees and the completeness and accuracy of database studies vary. Databases which extrapolated data to provide annual national rates estimated large numbers. Few studies provided data about the situations in which injuries occur and the causes of injuries.

Tomschi, F., Bloch, W., & Grau, M. (2018). Impact of Type of Sport, Gender and Age on Red Blood Cell Deformability of Elite Athletes. *International Journal of Sports Medicine*, 39(1), 12-20. doi:10.1055/s-0043-119879

Our objective was to detect possible differences in red blood cell (RBC) deformability of elite athletes performing different types of sports and being of different age and gender. 182 athletes were included in this cross-sectional study. RBC deformability was measured using the laser-assisted optical rotational cell-analyzer. Maximal elongation index (Elmax) and shear stress at half-maximum deformation (SS1/2) were calculated. The ratio SS1/2/Elmax (EIRatio) was calculated with low values representing high RBC deformation. Hematocrit (Hct) and mean cellular volume (MCV) were determined in venous blood. Overall RBC deformability did not differ between male and female athletes but, when separated by age of the subjects, RBC deformability increased with age in male but not in female athletes. RBC deformability was lower in Combat sports compared other sport groups. Hct

was higher in male compared to female athletes while no difference was observed for MCV. MCV and Hct increased with increasing age. A negative correlation was found between the EIRatio and MCV and between EIRatio and Hct. Conclusion: RBC deformability is influenced by age and endurance rate of the sport which suggests that the RBC system may adapt to changing conditions such as adolescence with the onset effects of sex hormones or physical exercise.

Trompeter, K., Fett, D., Brüggemann, G. P., & Platen, P. (2018). Prevalence of Back Pain in Elite Athletes. / Prävalenz von Rückenschmerzen bei Elitesportlern. *German Journal of Sports Medicine / Deutsche Zeitschrift für Sportmedizin*, 69(7/8), 240-245.

Objectives: The primary objectives of this investigation were to provide an overview of data about back pain prevalence in athletes, to analyse the prevalence in the German elite athletic population, and to compare it with physically-active individuals. Methods: 1. A comprehensive analysis of the literature was undertaken, using specifically developed search strategies for relevant epidemiological research on back pain. 2. An online back pain questionnaire was sent to approximately 4,000 German elite athletes and a control group of 253 physically-active individuals. Results: Lifetime and point prevalence were the most commonly researched episodes and the lower back was the most common location of pain. Lifetime prevalence of low back pain in athletes was 1-94%, and point prevalence was 18-65%. In German elite athletes, prevalence rates were 77% and 34%, respectively, and were slightly higher in athletes than in active controls (71% and 29%, respectively) and the general population (11-84% and 7-33%, respectively). Prevalence of back pain varied between athletes of different disciplines. Conclusion: Back pain is a common complaint in athletes and in the general population. A high training volume in athletes and a low training volume in the general population might increase prevalence rates. Our findings indicate the necessity for specific prevention programs, especially in high-risk sports. Further research should investigate the optimal dose-effect relationship of sporting activity to prevent back pain.

Tron, R., Hruzevych, I., Salnykova, S., Kormiltsev, V., Sarafynyuk, P., Kyrychenko, Y., . . . Kropta, R. (2018). Psychophysiological conditions and competition in highly qualified combat sambo wrestlers. *Journal of Physical Education & Sport*, 18(2), 600-605.

The article represents the outcome of the research of the problem of taking control over the specific preparedness of qualified combat sambo wrestlers. The study includes the data of experimental investigation carried out to prove the efficacy of the program developed to monitor the preparedness of the qualified combat sambo wrestlers. The program proposed allows utilizing the data of the level of physical and technical prepared, psychophysiological and the functional cardiovascular system conditions of the qualified combat sambo wrestlers by the testing results and make a prognosis about the secure performance of throws and the other athlete activities at the contest. The overall scale of contest activities and effective throws, informative indicators of physical technical preparedness and psychophysiological state of combat sambo wrestlers have also been determined in the study. The relationships of informative indicators of specific preparedness with the coefficient of secure throw performance and qualified combat sambo wrestlers activities at the contest were defined. The program of monitoring the special preparedness of qualified combat sambo wrestlers that allows the prognostic estimates for secure performance of effective throws and combat sambo wrestlers activities under conditions of the competition has been developed and proven. The data obtained allow choosing the optimal tactics and strategies for the contest where all strengths and weaknesses of combat sambo wrestlers preparedness were accounted for.

Tropin, Y., & Boychenko, N. (2018). Features of psycho-physiological indicators in various types of wrestling / Особенности психофизиологических показателей в различных видах борьбы *Slobozhanskyi R & Sports Bulletin*, 68(6), 54-58.

Purpose: establish the characteristics of the manifestation of psycho-physiological reactions in various types of wrestling. Material & Methods: analysis of scientific and methodological information, generalization of advanced practical experience, psycho-physiological research methods, methods of mathematical statistics. The study involved 30 qualified athletes involved in various types of wrestling, aged 19 to 22 years. Participants were divided into 2 groups of 15 people: 1 – Greco-Roman and freestyle wrestling; 2 – judo and sambo. Athletes were qualified as master of sports and candidate of master of sports. Results: simple, complex motor reactions and specific perceptions of wrestlers were evaluated. In the course of the study, it was determined that the best indicators of simple reactions are observed in representatives of judo and sambo (from 1% to 4%), while in Greco-Roman and freestyle wrestlers, results in complex reactions (from 1% to 13%) and specific perceptions (from 5% to 14%). Conclusions: it was established that different types of wrestling form the ability to quickly analyze, evaluate and predict situations and make the right decisions in a timely manner during the fight, which explains the unreliable differences ( $p > 0,05$ ) in the psycho-physiological indicators of the athletes studied.

Tropin, Y., Romanenko, V., Goloha, V., Aleksieieva, I., & Aleksenko, Y. (2018). Peculiarities of sensory motion reactions by students of KSAPC / Особенности проявления сенсомоторных реакций студентами ХГАФК *Slobozhanskyi R & Sports Bulletin*, 65(3), 57-62.

Purpose: to establish the features of the manifestation of sensorimotor reactions by students of various specializations of KSAPC. Material & Methods: analysis of scientific and methodological information, generalization of best practical experience, psychophysiological methods of research, methods of mathematical statistics. 72 first-year students of the KSAPC, engaged in various sports, aged from 17 to 19, took part in the research. Participants were divided into 4 groups of 18 people: 1 - cyclical sports (track and field, cycling, tourism); 2 - complex coordination sports (sports and artistic gymnastics, acrobatics, sports dances); 3 - sports games (football, basketball, volleyball, handball); 4 - martial artists (freestyle and Greco-Roman wrestling, judo, boxing). Athletes were qualified from the 2nd category to the candidate for master of sports. Results: in the course of the study it was determined that the best indicators of sensorimotor reactions were observed among students of martial artists, and then - in representatives of sports games, complex coordination and cyclic sports. The greatest differences from the results of the assessment of the level of sensorimotor reactions of martial artists were marked with cyclical sports (from 6% to 12%), followed by complex coordination sports (from 3% to 6%) and sports games (from 1% to 5%). Conclusions: conducted research confirmed the importance of psychophysiological characteristics of athletes of various sports as success factors.

- Tropin, Y., Romanenko, V., Goloha, V., & Veretelnikova, N. (2018). Relationship between physical development and physical readiness among skilled wrestlers / Взаимосвязь физического развития и физической подготовленности у квалифицированных борцов *Slobozhanskyi R & Sports Bulletin*, 63(1), 102-107. Purpose: to determine the relationship between physical development and physical readiness among qualified wrestlers. Material & Methods: in the study involved thirty qualified wrestlers, aged 19–22 years. For the purpose of analyzing indicators of physical development and physical preparedness, pedagogical testing. Results: the results of the study testify to the homogeneity of the indices of physical development of the athletes under study, the coefficient of variation is in the range from 2.43% to 10.93%. It is revealed that the indices of physical readiness of qualified wrestlers are characterized mainly by small variation in the testing of speed-strength qualities, coordination abilities, general and strength endurance, and average – in the results of special endurance. Conclusion: it is determined that the most informative indicators of physical development are the weight of the wrestler's body, which has a connection with 15 physical preparedness tests, followed by a vital index (12 statistically reliable relationships) and a strength index (11 interrelations).
- Tropin, Y. B., Natalya [Юрий Тропин, Юрий х], & Бойченко, Н. (2018). Interrelation of psychophysiological indicators and physical readiness of qualified wrestlers / Взаимосвязь психофизиологических показателей и физической подготовленности у квалифицированных борцов *Slobozhanskyi R & Sports Bulletin*, 64(2), 82-87. Purpose: to establish the features and degree of interrelation of psychophysiological indicators and physical readiness among qualified wrestlers. Material & Methods: analysis of scientific and methodological information, generalization of best practical experience, psychophysiological methods of research, pedagogical testing, methods of mathematical statistics. Thirty qualified wrestlers took part in the research, at the age of 19–22. Results: the results of the study indicate the uniformity of the indices of simple and complex reactions, since the coefficient of variation lies in the range from 6,04% to 10,94%. The indicators of specific perceptions have a high coefficient of variation (from 15,56% to 48,82%), this is because specific perceptions more individually reflect the psychophysiological state of qualified wrestlers. Conclusions: it is determined that the most informative indicators of physical readiness are the tests of the wrestler's strength abilities, which have reliable connections with 11 psychophysiological indicators, followed by tests characterizing the strength endurance, with five statistically significant interrelations.
- Tsushima, W. T., Ahn, H. J., Siu, A. M., Yoshinaga, K., Choi, S. Y., & Murata, N. M. (2018). Effects of repetitive subconcussive head trauma on the neuropsychological test performance of high school athletes: A comparison of high, moderate, and low contact sports. *Applied Neuropsychology: Child*, 1-8. doi:10.1080/21622965.2018.1427095
- The aim of this study was to examine the neuropsychological test results of non-concussed high school athletes playing at three different levels of contact sports. Based on the concussion risk data of 12 different sports, a High Contact group (n=2819; wrestling/martial arts, cheerleading, track and field, football), a Moderate Contact group (n=2323; softball, basketball, soccer), and a Low Contact group (n=1580; baseball, volleyball, water polo, tennis, cross-country) were formed and compared in terms of their scores on the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT). The results revealed that the High Contact group obtained small but statistically poorer performances in ImPACT Visual Memory, Visual Motor Speed, Impulse Control, and Total Symptom scores compared to the Moderate and Low Contact groups. The High Contact group also had poorer Reaction Time scores compared to the Low Contact group. No differences between the Moderate and Low Contact groups were noted. The findings, along with prior similar results, tentatively raise concerns that participant in high contact sports, exposed to repetitive subconcussive head trauma, may be at greater risk for lowered neuropsychological functioning and increased symptoms, compared to other high school athletes. In view of the preliminary nature of this investigation, more research into the effects of frequent head impacts in high school sports is strongly recommended.

Tsushima, W. T., Siu, A. M., Yamashita, N., Oshiro, R. S., & Murata, N. M. (2018). Comparison of neuropsychological test scores of high school athletes in high and low contact sports: A replication study. *Applied Neuropsychology: Child*, 7(1), 14-20. doi:10.1080/21622965.2016.1220860

This replication study re-examined the neuropsychological effects of participation in high and low contact youth sports. Modeled after a recently published investigation, two contact sport groups of participants ages 12 to 18 were formed based on the rate of concussion in their respective sport, with the assumption that more head impacts and neuropsychological effects occur in high contact sports that have a greater number of reported concussions as compared with low contact sports. The preseason baseline ImPACT neuropsychological test scores and symptom scores of non-concussed youth athletes in a High Contact Sport (football, n = 139) and a Low Contact Sport (basketball, baseball, soccer, wrestling, volleyball, paddling, and cheerleading, n = 57) were compared. The results revealed significantly poorer ImPACT test performances in visual motor speed and reaction time among high contact sport athletes compared to low contact sport athletes. No differences were found between the two groups in Verbal Memory, Visual Memory, and Total Symptom. These findings were identical to a recent study in which nonconcussed youth athletes in a high contact sport, that is, football, exhibited poorer neuropsychological test performance than their peers in low contact sports, that is, basketball, baseball, soccer, wrestling, and judo. This research replication verified the results of the prior study, and raises concerns that youth athletes exposed to repetitive head trauma may be at risk for lowered neuropsychological functioning, even without a reported concussive event. (PsycINFO Database Record (c) 2018 APA, all rights reserved)

Umarov, J., Kerimov, F., Toychiev, A., & Osipova, S. (2018). Vitamin D Level Among Elite Wrestlers in Uzbekistan. *International Journal of Wrestling Scienc*, 8(2), 36-39.

Purpose. The purpose of the study is to determine vitamin D (VD) levels and acute upper respiratory tract infections (URI) morbidity among elite wrestlers in Uzbekistan as well as possible association with overtraining syndrome (OS). Methods. Study participants included 40 elite wrestlers and 60 control individuals. Serum levels of 25(OH) VD and TNF- $\alpha$ , IFN- $\gamma$  and IL-4 were detected by ELISA technique. Frequency of URI was detected as well as parasitic infections. OS was diagnosed on the basis of typical symptoms and decreased performance. Results. Predominance of VD insufficiency was found in both groups of elite athletes and in the control individuals. Prevalence of VD deficiency/insufficiency depends on the season, but in every season the highest values were observed among athletes. The highest level of TNF- $\alpha$  and the lowest of IFN- $\gamma$  were observed in athletes with VD deficiency. Changes in the level of IL-4 were less expressed. Frequency of episodes of URI depends on VD level and the most number was detected in wrestlers with VD deficiency in winter-spring. OS was diagnosed in wrestlers free of infections, including parasitic ones, but with VD deficiency. Conclusion. VD deficiency/insufficiency is widely spread both in elite wrestlers and population in Uzbekistan. Monitoring of VD level in elite athletes with subsequent correction is necessary. VD deficiency/insufficiency in athletes correlates with high morbidity with URI and could be associated with OS.

Üzüm, H. (2018). Athletes' Perception of Coaches' Behavior and Skills about Their Sport. *Journal of Education and Training Studies*, 6(5), 28-33.

This study examined the perception of athletes about their coaches' behavior and skills in terms of knowledge and skills, fairness and coaches' characteristic features. The research was conducted by using relational survey method. The subjects of the study were 95 females and 180 males from different sports. Both team sports athletes such as football, volleyball, basketball, handball and individual sports such as karate, taekwondo, wrestling, kickboxing voluntarily involved in the study. Perceived Coach Attitudes and Behaviours Scale (PCABS) which was developed by Uzum et al. (2018) was used to assess perceived coaches' knowledge and skills, fairness and characteristic features by athletes. The scale was composed of 24 items and 3 sub-dimensions ("Characteristic Features," "Skills and Knowledge," "Fairness"). Uzum et al. (2018) reported the internal consistency for subscales of PCABS ranging from 0.56 and 0.88. For the purpose of this study the reliability of two sub-scales of the PCABS was examined using Cronbach's alpha coefficient ( $\alpha = 0.83$  for knowledge and skills;  $\alpha = 0.81$  for characteristic features of coaches). The data was analyzed by one-way analysis of variance (ANOVA), Tukey's Post-Hoc Analysis and Pearson Correlation analysis. The level of significance for the study was set at  $p < 0.05$ . The results of the study showed that the sub-dimension of characteristic features of coaches had the highest mean average. There were statistically significant differences between male athletes and female athletes in both dimensions of characteristic features of coaches and knowledge and skills ( $p < 0.05$ ). Further analysis indicated that females scored higher than males in both dimensions. With regard to the level of coaching either professional or amateur, perception of characteristic features of coaches had higher scores in professional level than amateur ( $p < 0.05$ ). Moreover, correlational analysis revealed that there was negatively significant correlation between age of the coaches and knowledge and skills dimension ( $r = -0.13$ ). On the other hand, the variables such as age of athletes, year of sports performance, level of education, type of sports and the coaches' gender, marital status, education level of coaches, amount of time spent with the athlete did not show any significant relationship ( $p > 0.05$ ).

Voelker, D. K., & Reel, J. J. (2018). Researching Eating Disorders and Body Image in Sport: Challenges and Recommendations. *Journal of Clinical Sport Psychology*, 12(4), 473-479.

The number of studies examining eating disorders and body image in sport has increased, although several major challenges associated with conducting this research must be addressed to continue growth. In this paper, we describe these challenges based on our professional experiences and the academic literature. Mistrust of researchers and the area of study, communication gaps, and factors that affect data quality are among the strong barriers discussed. However, we suggest that these challenges may be addressed by building stronger partnerships between researchers and practitioners and offer critical steps for developing meaningful professional relationships that will help move the field forward.

Yang, W.-H., Heine, O., & Grau, M. (2018). Rapid weight reduction does not impair athletic performance of Taekwondo athletes – A pilot study. *PLoS ONE*, 13(4), 1-19. doi:10.1371/journal.pone.0196568

In combat sports such as taekwondo (TKD), athletes rapidly reduce body weight to achieve a desired weight category. Competition takes place 16–24 h after weigh-in and thus, the recovery time is an important factor for competition performance. The purpose of this study was to investigate the impact of rapid weight reduction (RWR) on athletic performance and associated hemorheological properties considering relevant recovery time. Five male TKD athletes reduced body weight by 5% within 3½ days. A simulated competition day (SCD) was carried out after a 16 h recovery period. Parameters were measured before RWR, at weigh-in and before and after three TKD simulation matches (SMs) at SCD. Same set-up was conducted but without RWR as control. Basal blood parameters, red blood cells (RBC) deformability and aggregation, serum glucose and fibrinogen were determined. During SMs, heart rate (HR<sub>peak</sub>, HR<sub>mean</sub>), oxygen uptake (VO<sub>2peak</sub>, VO<sub>2mean</sub>), peak lactate (Peak La<sup>-</sup>), difference of lactate ( $\Delta$ La) and energy systems (anaerobic-alactic, -lactic and aerobic) were analyzed. Basal blood parameters remained unaltered during the interventions. RBC deformability was reduced and aggregation was increased after RWR but values returned to baseline after recovery and were not affected by the SMs. Glucose level was not affected by the interventions. Kick frequency in SMs was higher after RWR which might be responsible for higher HR<sub>peak</sub>, VO<sub>2peak</sub>, VO<sub>2mean</sub>, Peak La<sup>-</sup>,  $\Delta$ La- and aerobic demand. The 16 h recovery is sufficient to regenerate measured physiological and hemorheological parameters. TKD-specific performance was not negatively affected during SMs after RWR.

Zimányi, R. G., & Géczi, G. (2018). Quality of judo world championships in relation to justice theories and behavior— a case study of the 2017 world judo championships in Budapest. *International Journal of Wrestling Science*, 8(2), 1-8.

The judo world championships are major sport events, where, as in any other area of life, we strive for justice. How can the competitor's list of judo world championships be evaluated as just? When is the seeding right? When can we talk about a fair draw? When is a competition system fair? How can the final result be just and fair? Does everyone think that the final result is just? To answer the questions correctly, first of all we need to clarify the telos of the specific sporting event. This study presents the justice theories and examines the evolutionist conceptions from Aristotle's justice theory, through meritocracy and egalitarianism, to positive discrimination. It analyses a sporting event, the World Judo Championships 2017, held in Budapest. In the study we examine the competitor's list, the seeding, the draw, the competition systems and the final results of this judo world championship. Parallel to the analysis of justice theories, we use the method of personal observation as well. The study is based on an interview with the Operational Director of the Hungarian Judo Federation. We conclude that many theories of justice appear in relation to the judo world championships. However, only those theories of justice can be accepted which are consistent with the telos, the ultimate object or aim, of the event. As a summary the competitor's list, the seeding, the draws, the competition system and the final result can be fair, but their acceptance depends on which theory of justice is applied. The research confirms that there are such theories of justice which do not meet the telos.

Zubac, D., Karnincic, H., & Sekulic, D. (2018). Rapid Weight Loss Is Not Associated with Competitive Success in Elite Youth Olympic-Style Boxers in Europe. *International Journal of Sports Physiology & Performance*, 13(7), 860-866. Purpose: To examine the influence of rapid weight loss (RWL) on competitive success in elite youth Olympic-style boxers. In addition, this study examined the practice and prevalence of weight reduction, weight-management protocols, and related symptoms in youth boxers from 12 European countries (N = 83, all males, mean [SD] age 17.1 [0.9] y). Methods: The data were collected using an extensive questionnaire on weight cutting and its associated protocols and symptoms prior to highest-level continental championships. Competition results were obtained at follow-up using a dichotomous variable: medal winning vs nonwinning at the European Championships. Results: Binary logistic regression analysis indicated that "boxing experience" was significantly related to the criterion competitive outcome (odds ratio = 1.33; 95% confidence interval, 1.06–1.66; Nagelkerke R<sup>2</sup> = .11), with a higher likelihood of competitive success for more-experienced boxers. Of all the youth boxers, only 25% were included in the RWL group, irrespective of their weight-class stratification. More than 45% of all



the youth boxers self-reported the simultaneous combination of different weight-cutting methods that are known to be serious health hazards. Finally, 33% of the boxers experienced muscle weakness as a consequence of RWL. Conclusions: Our study provided evidence of pathogenic weight-management protocols that are widely adopted by youth boxers, and yet the present outcomes showed that RWL did not translate into competitive success in these elite Olympic-style boxers in Europe. Therefore, the authors suggest a mandatory educational program that should simultaneously target all the mentioned issues including both health- and performance-threatening consequences.