BOOK OF ABSTRACTS

IPS Instituto Politécnico de Setúbal
Escola Superior de Educação

cieqv centro de investigação em qualidade de vida

FCT Fundação para a Ciência e a Tecnologia

Book of Abstracts

2nd INTERNATIONAL CONGRESS EXERCISE, BIOMECHANICS AND NUTRITION – ESE/IPS 10 and 11 of May 2023

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Preface

Currently, we are attending to the diminution of an important number of congress which are decreasing with the number of attendees to the scientific meetings. In this context, universities, research centres and institutions should adapt to this complex reality that changed as consequences of COVID-19 pandemic for promoting knowledge and diffusion of the scientific advances. This cover more importance in the Sports Sciences professionals based on the new knowledge based in its young incorporation as object of study in the science and its application to new population groups and the inclusion of novelty technologies Polytechnic Institute of Setúbal is emerging as a reference in the supporting and diffusion of scientific advances in Sports Sciences across the International Congress: Exercise, Biomechanics and Nutrition in a commitment with the academic excellence of their students and the scientific community.

The second edition of the International Congress: Exercise, Biomechanics and Nutrition reflexes the success of this scientific-technical-informative initiative that makes to this event as one of the most important from Portugal and the Iberian Peninsula. This event selected an hybrid format that interspersed conferences of contrasted speakers with oral communications of Degree student and consolidated research groups. Assistants to this events that exceeded 200 participants attended to the last advances in 3 well differentiated areas as Biomechanics, Exercise and Sport Nutrition divided in 9 conferences.

Conferences were presented by prestigious researchers from 9 different universities of 5 different countries as Polytechnic Institute of Setúbal and Polytechnic Institute of Leiria (Portugal), University of Alcalá, Autonomous University of Madrid, Rey Juan Carlos University and University of Sevilla (Spain), Lavras University (Brazil), University of Salford (England), and University of Jyvaskyla (Finland). Therefore, it was exposed the last advances in the monitorization of neuromuscular fatigue in soccer using force plates, factor that favour reducing the risk of injury in athletes or in TMS and Strength Training. Also, it was exposed the last advances in the periodization of well-trained endurance athletes and the importance of nutrition and physical activity in the retired adults and physical programs for promoting the health status in clinical population (Parkinson´s disease). For the last, it was exposed ergogenic resources and their relations with sport performance and the importance of caffeine, sodium bicarbonate and beetroot juice in strength and power production.

However, the most important area of this Congress was the number and quality of the oral communication presented. In this sense, the International Congress: Exercise, Biomechanics and Nutrition is one of the Congress with a higher number of works presented by Graduate students that it is in combination with the results of contrasted research groups, some of the references at international level that include researchers from eight different countries as England, Brazil, Spain, Portugal, Colombia, Australia, Italy and Turkey.

Readers have the opportunity of supervising all these oral communication from the abstract presented in this Book of Abstracts.

Since the Organizing and Scientific Committees want to congratulate to all the researchers and attendees who participated in this second edition of the International Congress: Exercise, Biomechanics and Nutrition. In addition, to the external readers we invite to participate in the third edition that will be organized by Polytechnic Institute of Setúbal in 2024.

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Congress Committees

Organizing Committee
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Chair of the Organizing Committee: Luis Leitão
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Congress Program

May 10th, Wednesday

10:00 – Opening Session – ESE Auditorium
Angela Lemos | President of the Polytechnic Institute of Setúbal
Rául Dominguéz | Sport Sciences Department of University of Sevilla
Teresa Figueiredo | Head of Science and Technology Department of ESE-IP Setúbal
Luis Leitao | Professor at the Science and Technology Department of ESE-IP Setúbal

10:30 – *Physical Activity, Exercise and Nutrition – ESE Auditorium*

Beetroot Juice supplementation in strength and power training – **PhD Raul Dominguéz, University of Sevilla, Spain.**

Training volume, intensity distribution and periodization in well-trained and elite distance runners". – **PhD Arturo Casado, Rey Juan Carlos University, Spain.**

12:00 - Abstract/Video Oral Presentations I

13:00 – Lunch Break

14:00 – *Exercise and Biomechanics in sport* – ESE Auditorium

Monitoring neuromuscular fatigue in soccer with force plates: current evidence and future directions – **PhD John MacMahon, University of Salford, UK**.

14:40 – Is it necessary to reach muscle failure to maximize quadriceps muscle architecture adaptations in team sports players? A meta-analysis – **MsT Javier Pecci**

15:00 - Machine Learning Analysis of the Relationship between Physical Activity and Bone Mineral Density in U.S. Women – **Mst Horacio Sanchez-Trigo**

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May 11th, Thursday

8:30 – Abstract/Video Presentations III

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11:30 - Promoting engagement to exercise in Parkinson's Disease – **PhD Carla Pereira**, **ESS-IPS, Portugal.**

13:00 – Lunch Break

14:00 – Ergogenic resources and their relationship with sport performance: expectation x reality – **PhD Sandro Silva, Federal University of Lavras, Brazil**

14:45 – The importance of nutrition in power production: caffeine and sodium bicarbonate – **PhD Alberto López-Pérez, University of Alcalá, Spain**

16:00 – *Congress Closing Session*
João Pires | Dean of Superior School of Education of the Polytechnic Institute of Setúbal
Luis Leitão | Professor of Science and Technology Department at ESE-IP Setúbal
Ana Pereira | Coordinator of the Degree in Sports at ESE-IP Setúbal

Abstracts

Menstrual cycle and strength levels in adult women: a pilot study

Francielle de Assis Arantes [1,2*], Bárbara Dias Diniz da Costa[1,2], Juliana Souza Valente[1,2], Irismar Gonçalves Almeida da Encarnação[1,2], Osvaldo Costa Moreira [1,2,3], Claudia Eliza Patrocínio de Oliveira[1,2]

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Abstract: The menstrual cycle (MC) induces variations in serum sex hormone concentrations regulated by the hypothalamic-pituitary-ovarian axis. It is speculated that hormonal oscillations during the different phases of MC may influence physiological systems such as skeletal muscle, which may impact physical performance and quality of life. Considering that there is no consensus in the literature on this topic, the present study aimed to verify and compare the effects of CM on the strength levels of young adult women. The sample consisted of women between 18 and 25 years old, who used (G1) or not (G2) oral contraceptives (OC). For the volunteers who did not use OC, the determination of the CM phases was estimated by the average length of previous menstrual cycles using a cell phone application. For all volunteers, collections were planned where greater hormonal oscillations are visualized, on days 01 (early follicular phase), 11 (late follicular phase) and 21 (middle luteal phase). Hormone concentrations were determined by blood draw. Muscle strength was assessed by maximal isometric voluntary contraction (CVIM) and maximal dynamic strength (1RM) tests. Data were treated using 2-factor ANCOVA (group and time), with a significance level of $p<0.05$. For intragroup comparison, G1 showed a significant reduction in MVIC during the late follicular phase, while G2 did not show significant differences. For intergroup comparison, there was a significant reduction in IVC (late follicular phase) and 1RM (middle luteal phase) in G1 compared to G2. Thus, it is possible to consider that the results of this pilot study suggest that CM induces a reduction in muscle strength levels during the late follicular phase and mid-luteal phase in young adult women.

Acknowledgment: This study was funded by the Fundação de Amparo à Pesquisa de Minas Gerais (FAPEMIG) - APQ-02915-21.

Keywords: Menstrual Cycle, Estrogen, Progesterone, Muscle Strength, Muscle Power.

Does the menstrual cycle promote changes in flexibility levels? A preliminary analysis

Juliana Souza Valente[1, 2*], Bárbara Dias Diniz da Costa[1,2], Francielle de Assis Arantes[1,2], Osvaldo Costa Moreira [1,3], Cláudia Eliza Patrocínio de Oliveira[1,2]

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Abstract: During the menstrual cycle (MC), there are variations in serum concentrations of female sex hormones that can influence the structures and functions of muscle and connective tissue. With regard to flexibility, some studies have shown that such hormones can modulate the structural and mechanical properties of ligaments. Therefore, it is necessary to understand the behavior of flexibility in the face of hormonal changes present in the CM. Therefore, the present study aimed to verify and compare the effects of CM on the flexibility of young adult women. The sample consisted of women between 18 and 25 years old, who used or did not use oral contraceptives (OC). For the volunteers who did not use OC, the determination of the CM phases was estimated by the average length of previous menstrual cycles using a cell phone application. For all volunteers, collections were planned where greater hormonal oscillations are visualized, on days 01 (early follicular phase), 11 (late follicular phase) and 21 (middle luteal phase). The determination of hormone concentrations was performed by blood extraction. To assess flexibility, the Wells bank was used. Data were treated using 2- factor ANCOVA (group and time), with a significance level of $p<0.05$. In the intragroup comparison, flexibility showed a reduction in the late follicular phase compared to the medium luteal phase, in the group that did not use OC. The group that used OC showed no significant difference. In the intergroup comparison, no significant difference was observed between the two analyzed conditions. Thus, based on a preliminary analysis of the data, it is possible to consider that CM seems to induce reductions in flexibility levels in adult women, during the late follicular phase.

Acknowledgment: This study was funded by the Fundação de Amparo à Pesquisa de Minas Gerais (FAPEMIG) - APQ-02915-21.

Keywords: Flexibility; menstrual cycle; female hormones; estradiol; progesterone

Effects of Physical Training on the physical functional capacity and quality of life of patients with chronic non-communicable diseases in an interprofessional program

Caio Campelo Werneck [1,2], Caio Oliveira Lima[1,4], Higor Leal Fernandes[1,2], Jonas Lopes de Medeiros[1,2], Elaine Gemellaro [1,2], Marcela Pereira Oliveira [1,3], Antônio Paulo André de Castro[1,2,3*]

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Abstract: Chronic non-communicable diseases (NCDs), such as diabetes mellitus (DM), arterial hypertension (BP) and obesity (Ob), are associated with reduced physical-functional capacity (CFF) and quality of life (QoL), significantly increasing the risk for premature morbidity and mortality. On the other hand, physical training (PT) has a supporting role as a non-pharmacological approach for the prevention and treatment of NCDs, as well as improving the CFF and QoL of practitioners, especially when carried out in an interprofessional setting. To investigate the effects of TF on CFF and QoL of patients with NCDs followed in an interprofessional health care program. Methods: 86 sedentary patients were followed for 6 months in the RT program (resistance exercises; 2x/week) with mild to moderate intensity on the adapted Borg scale. The CFF was evaluated by the following tests: handgrip (HG), sit and stand in 30 seconds (TSL-30"), timed up and go (TUG), six-minute walk (6MWT) and flexibility (FLEX). QoL was assessed using the SF-36. All assessments were performed in the initial period (Ass1) and after 3 (Ass2) and 6 months (Ass3) of follow-up. Results: The mean age of the patients was 58.6 ± 12.7 years, and the mean BMI was 31.6 ± 8.3. The prevalence of BP was 81%, DM 48.7% and Ob 55.0%. After follow-up, there was an increase in HG (27.4±9.4; 28.2±8.3; 30.5±4.6), in the TSL-30" (10.3±2.6; 11 .5±2.7.
12.7±2.3), in TUG (9.5±5.1; 8.8±4.3; 7.7±1.3), in FLEX (20.8 ±10.5; 22.6±10.6.
24.8±11.6) and in the 6MWT' (401.5±77.3; 423.8±77.1; 445.7±74.8). After follow-up,
QoL improved in all 8 domains assessed by the SF-36. Patient adherence to the program was greater than 90%. CONCLUSION: Supervised ST performed in an interprofessional program proved to be safe and effective in increasing the CFF and QoL of patients with NCDs.

Keywords: Diabetes Mellitus, Hypertension, Obesity, Exercise, Interprofessional education

Effect of eight weeks of eccentrically strengthened resistance training on executive function in elderly women: study protocol for a randomized controlled trial

Amanda dos Reis Cota[1*], Pablo Augusto Garcia Agostinho[1], Édison Andrés Pérez Bedoya[1], Claudia Eliza Patrocínio de Oliveira[1], Osvaldo Costa Moreira[2], Miguel Araújo Carneiro Júnior[1]

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Abstract: Executive function is considered a complex cognitive ability that allows the individual to direct, inhibit, and alternate behaviors and thoughts to achieve goals. Executive function is affected by aging and is the first to suffer decline, while engaging in physical exercise may be an ally to ameliorate the effects from the decline in executive function. To date, this will be the first randomized controlled trial to evaluate the effect of eccentrically reinforced resistance training (ERRT) on executive function. To construct this protocol in clinical trial the Spirit 2013 statement will be considered and to ensure completeness and reproducibility will use the Consensus on Exercise Reporting Template (CERT). This trial will have two groups of sedentary elderly women (n = 22), being a TRRE group and a conventional resistance training (CRT) group. The intervention will take place over eight weeks, twice a week (16 sessions). The TRRE group will use the multi-gyn with inertial flywheels device to perform the TRRE, performing 4 sets of 8 repetitions and must maintain maximum concentric strength in all repetitions. The TRC group will perform exercises on conventional weight-training equipment, performing 4 sets of 8-12 repetitions, maintaining intensity between 6 and 10 on the OMNI-RES scale. The interventions will take place at the Physical Education Department of the Federal University of Viçosa. The primary endpoint will be executive function. The secondary endpoints will be sleep behavior and quality, quality of life, strength manifestations, body composition, and adverse harm. The elderly women will be allocated to either the TRRE or TRC groups using random number software. The principal investigator will be blinded, as will the person responsible for the statistical analyses. Blinding will be performed by an external researcher using the opaque envelope technique. The study will be registered as a clinical trial on clinicaltrial.gov.

Acknowledgments: The research will be supported by CAPES and FAPEMIG grants.

Keywords: Aging, Executive function, functionality, women, strength training.

PHYSICAL EXERCISE AND MAJOR DEPRESSIVE DISORDER IN ADULTS: SYSTEMATIC REVIEW AND META-ANALYSIS.

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Abstract: The objective was to identify the benefits and harms of different physical exercise modalities in the symptomatology of major depressive disorder in adults without usual treatment. Methods: We conducted a systematic review and meta-analysis of randomized controlled trials. Medline (via Ovid), Cochrane Central Register of Controlled Trials (CENTRAL), Embase, PsycInfo, Web of Science, Clinical Trials repository, gray literature, and manual search were searched from inception to November 2022 for relevant studies without language restriction. The following inclusion criteria were used for studies to determine their eligibility: randomized controlled trials (RCTs) in adults diagnosed with major depressive disorder who did not consume antidepressant medication or attended psychological therapy, with or without the presence of chronic communicable or non-communicable diseases, that compared physical exercise modalities with usual therapy, body-mind exercise, or did not exercise. We excluded randomized controlled trials in development with pregnant women and adults with other mental health disorders such as bipolar disorder and anxiety. The risk of bias and the quality of evidence were evaluated using the Cochrane Risk of Bias II Tool and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE), respectively. The main outcome was depressive symptoms measured using validated depression scales after the intervention. Results: The nine RCTs included 678 adults (211 men 31.12% and 467 women 68.88%) between 20 and 72 years old. The pooled standardized mean difference (SMD) of the 7 trials (12 interventions), calculated using the random effects model, was -0.27 (95% CI [-0.58, 0.04) P= 0.09, indicating a small clinical effect in favor of exercise on the scores of the instruments evaluating the symptoms of depression, I^2 = 76%. The sensitivity analyzes showed a moderate effect size, compared to the primary outcomes, in favor of physical exercise: - 0.58 [-1.15, -0.01]. They even showed statistical significance: (P = 0.05); I^2 = 85%. The subgroup analyzes demonstrated that the intervention (i.e., <12 weeks duration, frequency 5 per 150 minutes per week, high intensity and with supervision) and characteristics (that is, less than 50 years of age, overweight and obese, and diagnosis of depression) could influence the overall effect of treatment. Conclusions: We found low to very low-quality evidence supporting the effect of physical exercise, compared to usual therapy, body mind exercise or doing nothing, on symptoms of major depressive disorder. Physical exercise is safe, although it produces adverse events that can be easily controlled. We downgraded the certainty of the evidence due to methodological limitations, inconsistency, and imprecision. These are preliminary results; well-designed and reported randomized controlled trials are required.

Keywords: systematic review; meta-analysis; major depressive disorder; PE

Sleep quality in physically active olders: an observational and comparative analysis

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Abstract: Biological changes during aging reduce sleep time, quality, and depth. Regular physical exercise is considered an adjuvant in controlling and mitigating sleep disorders in older people. It was an observational and comparative study, which aimed to evaluate the sleep quality of 40 trained elderly people (31 women and nine men) who participated in a multicomponent training program for six months, three times a week, from 09:00 to 10:00 in the "+Idade+Saúde" project in the sports department of the Polytechnic Institute of Bragança (IPB), Portugal. We assessed the sleep quality using the Pittsburgh scale adapted for Portugal. Statistical analyzes were conducted in the Python™ version 3.11.2 programming language. Variables were reported as mean and standard deviation, absolute values, and percentages. The chi-square test of two simple proportions (X2) was used to compare the frequency of participants with and without sleep disorders. We considered the 95% confidence interval ($p < 0.05$) for the statistical significance and calculated the effect size (ES) by Crámer's V (V) (≤ 0.10 = small, ≥ 0.30 = moderate, and ≥ 0.50 = great). We found a higher number of participants with sleep disorders in the total sample [normality = 14 (35%); sleep disorders = 26 (65%), $X^2 = 4.242$ (39), $p < 0.001$, $V = 0.52$, large ES], in females [normality = 11 (27.5%); sleep disorders = 20 (64.5%), $X^2 = 5.253$ (30), $p < 0.001$ $V = 0.76$, large ES], and in males [normality = 3 (33.3%); sleep disorders = 6 (67%), $X^2 = 4.808$ (8), $p < 0.001$ $V = 0.98$, large ES]. We conclude that high rates of sleep disorders were found in trained elderly, regardless of gender.

Keywords: Sleep habits, aging, physical activity, multicomponent training, quality of life.

Analysis of the training in inclusion and attention to diversity of physical education teachers in El Salvador

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Abstract: The 21st century is a period of social change, in which inclusion is a challenge for society as a whole. Physical education teachers must respond to this challenge and make room in their classes and activities for all learners in their groups. This means that physical education teachers must be well-trained and committed professionals, not only to their profession but also to the inclusive character that must predominate in their development. The aim of this study is to analyse the training of physical education teachers in El Salvador and their need for training in relation to educational inclusion, in order to meet the special educational needs of students who require support. The participating teachers were a total of 68 teachers from different educational stages who were going to receive a training course on educational inclusion for students with visual impairment. In order to collect the information, a questionnaire was used, which was developed ad hoc, modifying some of the questionnaires used in research to assess the sensitivity and training of physical education teachers towards disability. Among the results we found the need for a change in initial and ongoing training that focuses on the attention of students with diversity, the difficulties of dealing with diversity in a non-adapted environment and without materials, the importance of teachers' thinking and organisational cultures that support inclusion and collaboration between the centre and professionals, and the importance of the attitude and aptitude of teachers to the situation of need and inclusion within the area of physical education, as an essential conclusion drawn from the results.

Keywords: Educational inclusion, attention to diversity, teacher training and physical education.

Analysis of implementation fidelity in a Positive Youth Development through competitive sports program

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Abstract: Positive Youth Development (PYD) is a conception of development based on capabilities, in which children and adolescents are seen as resources to be developed rather than problems to be solved. PYD through sports programs can provide opportunities for young people to be responsible and learn the skills necessary to succeed in their daily lives, and have been gaining increasing relevance in the scientific literature. However, implementation fidelity has traditionally been overlooked in research applying these types of programs, often being a weak point of them. Therefore, the aim of this work was to analyze the implementation fidelity of a PYD program arising from the hybridization of the Personal and Social Responsibility and Sports Education models in a competitive female volleyball team. Fifteen girls between 8 and 10 years old and a 26-year-old coach, belonging to a volleyball club in Seville (Spain), participated. Data were collected through recordings of four complete training sessions distributed throughout the intervention, which were analyzed through observational methods by two independent observers using the Tool for Assessing Responsibility-based Education (TARE) 2.0 observation instrument. The results showed that the methodological strategies and player behaviors presented high consistency and temporal applicability, maintaining a high quality of implementation throughout the intervention. Therefore, the intervention program has been successfully implemented and during its implementation the athletes have exhibited behaviors conducive to facilitating the acquisition of life skills. In addition, the results help to understand and interpret the effects of PYD programs on participants.

Keywords: Observational methods; Teaching personal and social responsibility; Sport Education; Hybridization; Volleyball.

Barriers for sports practice in professional female soccer

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Abstract: In recent years, women's soccer has grown in importance to society, officially becoming professional in Spain a few years ago. However, there are still many unknown factors about this sport. Therefore, it is essential to study and analyze in depth the perception of female soccer players, whose personal and sports experiences can shed light on this field of study that has been little addressed in existing scientific literature. The main objective of this study was to identify the barriers that hinder sports practice perceived by professional soccer players in Spain throughout their sports careers. The sample consisted of four women from two different teams in La Liga Iberdrola (the national first division of women's soccer). The study used a qualitative methodology, following a phenomenological design, and semi-structured interviews were used for data collection. The results showed that the main barriers to practice perceived by the participants were practicing a predominantly male sport, physical appearance and gender discrimination, highlighting mainly that differences between men and women still exist today in all areas of soccer, although they are decreasing compared to previous years. In conclusion, the results obtained in this study, together with those presented in the scientific literature in this field of study, provide a clear and realistic view of the barriers to sports practice faced by female soccer players, facilitating decision making of policy-makers and stakeholders in order to perform specific actions to enhance professional women's soccer in a holistic way.

Keywords: Women's soccer, Professional, Resources, Facilitators, Competition

Resources and facilitators of competitive sports practice in professional female soccer

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Abstract: Although women's soccer is a rising topic today, there are still many unknown factors about it. Therefore, it is important to study and analyze in depth the vision of the most important agents of this discipline, the soccer players themselves, since they are the ones who can provide the most information about their sport from their personal experience and life events, which they have developed for most of their lives. The aim of this study was to identify and understand the resources and facilitators perceived by professional soccer players in Spain throughout their sports careers. Four women from two different teams in La Liga Iberdrola (the national first division of women's soccer) participated in the study, using semi-structured interviews for data collection, following a qualitative methodology with a phenomenological design. The results show that the main resources and facilitators perceived by the athletes were the technical staff, the social environment, and personal values. It is also worth noting that differences between men and women in a traditionally male sport still exist today in all areas of it, although they are decreasing compared to previous years. In conclusion, the results obtained in this study, together with those found and related in some previous studies, allow us to compile a comprehensive list of resources and facilitating elements that reflect the reality of female soccer players and therefore allow for direct action to improve this reality as a whole.

Keywords: Women's soccer, Professional, Resources, Facilitators, Competition

Analysis of performance improvement in non-professional swimmers who participate in official competitions, using high volume training.

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Abstract: INTRODUCTION: Nowadays, coaches continue to subject competitive swimmers to high-volume, low-intensity training (HVT), with the ultimate objective of improving performance (Nugent, et al., 2017; Tate et al., 2012). But this traditional training has been highly questioned in terms of its effectiveness, due to the fact that the vast majority of the tests that are usually performed in swimming competitions tend to last a short time (Aspenes, and Karlsen, 2012; Costa, Bragada, Marinho, Silva, and Barbosa, 2012; Costill et al., 1991; Lang and Light, 2010). The aim of this study is to investigate the effectiveness of the application of high-volume, low-intensity training in competitive swimmers and the effect it has on their performance. METHODS: During 12 weeks, 145 amateur swimmers participating in official competitions with different swimming clubs in the Valencian Community (Spain) took part in this research. They ranged in age from 6 to 17 years old. All swimmers performed the front crawl test before, during and after the study. They performed a traditional training of 6 hours, distributed in 3 days per week. The training (HVT) included sets dedicated to technique, bilateral breathing and displacement. The critical swimming speed (CS) test and the Swolf test were used as tools to monitor performance, in addition to the times obtained in competitions. RESULTS: There were significant improvements in performance, irrespective of the swimmer's gender. 75.3% of swimmers improved their personal bests. CONCLUSION: Performance in non-professional swimmers participating in official competitions improved with the implementation of a 12-week training programme based on high-volume, low-intensity training.

Keywords: Traditional training, high volume at low intensity, technique, amateur swimmers, official competitions.

Dietary intake and performance of endurance runners supplemented with nitrate-rich beetroot juice

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Abstract: Obtaining a nutritional status is essential for endurance runners due to the energy demands, which have an impact on performance. Since the energy system in this type of modality is used with great vigor during training, competitions and recovery. Along with this, sports supplements have been investigated to help with these tasks, such as nitrate (NO3-), whose function is to contribute to processes such as O2 consumption and contractility of muscle fibers, for example, after its conversion in the body to nitric oxide. Prevailing these arguments, we sought to investigate the dietary intake of amateur endurance runners and subject them to a 3,200m time trial after the acute ingestion of NO3- supplementation for performance analysis. The research included 13 men (25±4.7 years old, % of G 6.7±3.5) engaged in street running (6.0±4.9 years old), who were subjected to a crossover, randomized. The study was carried out in 2 stages, as follows: 1st) Referring to the instructions for completing a 24-hour dietary recall. 2nd) It was divided into 2 visits separated by a period of 7 days, where 2h after the ingestion of NO3- supplementation (~6.4mmol) or placebo (Kapo®) the participants were submitted to a 3,200m time trial in the running track, recording time. Descriptive statistics, Kolmogorov-Smirnov and Shapiro-Wilk tests (SPSS® 21.0) were used. The time in the 3,200m obtained a reduction of 2.6s when supplemented with NO_3- (SUP 720.0s ± 83.7vs.PLA 722.6s ± 81.5), without significant differences. The macronutrients followed the determined ptn averages: 1.60g/kg ±0.91; lip: 0.70g/kg ± 0.64; carb 3.97g/kg±2.75. Despite observing a minimal but satisfactory result in running, it is necessary to report the deficit of a fundamental macronutrient, carbohydrate, according to the daily nutritional recommendations (5-8g/kg of weight/SBME), which may negatively affect the performance at these events.

Keywords: Sports Performance. Running. Nitric oxide. Food Consumption. Carbohydrate.

Analysing the effectiveness of nutritional supplement on the performance in swimming

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Abstract: Athletes present a high rate of nutritional supplement (SN) independently of the sport modality, sex or competitive level. Relevant institutions as the International Olympic Committee (IOC) ha stablished a classification of NS based on its effect on performance based on the scientific level. Creatine, caffeine, sodium bicarbonate, β-alanine and nitrate have demosntrated a high level of evidence. However, ergogenic effect could be mediated by mechanical and metabolic demands of each sport modality. Objective: to analyse the effect of SN with a high level of scientific evidence in swimming. Methods: a search of studies was performed using keywords and boolean connectors was performed in the next databases: Dialnet, Directory of Open Access Journals, Pubmed, Scielo, Scopus and SportDiscus. The search strategy was the next: (concept 1) (supplement* OR "ergogenic aid") AND (concept 2) (swimming OR swimmer OR "aquatic sport"). Results: a total of 20 studies were included in the review including 6 articles focuses in creatine, 4 in nitrate, 3 β-alanine, 2 sodium bicarbonate caffeine while 3 studies assesssed the effect of the co-ingestion of sodium bicarbonate with β-alanine, creatine and caffeine. Creatine supplementation could be considered ergogenic in swimming (statistica effect demonstratred in 4/6 studies), specially in interval procedures. Caffeine has reported ergogenic effect in the 2 studies that assessed its effectiveness in trained swimmers. In addition, sodium bicarbonate has reported ergogenc effect in intermittent sessions and middle-distance evvents while β-alanine effects are enhanced in the co-ingestion with sodium bicarbonate. Studies focuses in the efectiveness of nitrate are not conclusive about the ergogenicity of this supplement in swimming.

Keywords: ergogenic aids; exercise; nutrition; supplementation; swimming

Resistance exercise and physical function in older women: study protocol for a randomized controlled trial

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Abstract: Women are more susceptible to physical function problems with aging, especially after menopause. However, resistance training (RT) can ease and/or delay this decline. To date, this will be the first randomized controlled trial to evaluate the effect of eccentrically strengthened resistance training (ERRT) on physical and cognitive function in older women. This trial will have two groups consisting of inactive women aged 60 years and older (n=22). For the construction of this protocol in a clinical trial the 2013 Spirit Declaration will be considered and to ensure completeness and reproducibility the Consensus on Exercise Reporting Template will be used. The intervention will consist of 16 sessions, twice a week, including seven TRRE exercises for the lower and upper limbs. The experimental group (EERT) will use multi-gym equipment with inertial flywheels and will perform 4 sets of 8 repetitions, always at intensity 10 on the OMNI-RES scale. The control group (traditional RT) will use strength training machines and free weights and will perform 4 sets of 8 to 12 repetitions keeping the intensity between 6 and 10 on the OMNI-RES scale. Both groups will have the same time under tension and rest time between sets and exercises. The primary outcome analyzed will be physical function and the secondary outcomes will be the risk of falls, quality of life, manifestations of strength, body composition, and adverse damage. Sociodemographic information and vital signs will also be evaluated. Women will be randomly assigned to intervention and control groups using random number software. The main researcher and evaluator of the results will be blind, as well as the researcher responsible for the study statistics. Masking will be performed by an external researcher using the technique of hidden and opaque envelopes. The study will be registered as a clinical trial at clinicaltrial.gov.

Acknowledgments: The research will be supported by CAPES and FAPEMIG grants.

Keywords: Physical functional performance, aging, functionallity, women, resistance training.

Effect of Blood Flow Restriction Strength Training with Low Loads vs. High Loads

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Abstract : Objectives: The aim of this study was to analyse the effect of two blood flow restriction strength training protocols that differ in the load used in the full squat exercise. **Methodology**: Twenty-eight physically active men with experience in full squat exercise (Age: 23.6±4.2 years; Height: 179.5±5.7 cm; Weight: 76.7±9.3 kg; 1RM: 102.8±19.7 kg; Relative Strength: 1.33±0.16 kg·kg; AOP: 230.4±17.3 mmHg), were randomly assigned to two groups: High Loads (HL: 70-80% 1RM; n=14) or Low Loads (LL: 40-50% 1RM; n=14). They performed a training program for 8 weeks consisting of twice-weekly 3 sets of full squats, with a 20% velocity loss in the set (VL) and 2 minutes of recovery between sets. A blood flow restriction of 50% of the AOP was applied. The difference between groups was the intensity used, HL trained with loads of 70-80% 1RM and LL with 40-50% 1RM. Pre and post-training evaluations included: countermovement jump height (CMJ) and 1RM and fatigue resistance tests in the full squat. **Results**: Only a significant "group x time" interaction was found in the CMJ variable ($p<0.05$). Significant intragroup differences (pre-post) were found in both groups for all analyzed variables ($p<0.001$). Effect sizes (ES) for HL were: (CMJ: 1.52; 1RM: 0.71; MNR: 1.27; Relative Strength: 1.08) and for LL: (CMJ: 0.63; 1RM: 0.62; MNR: 1.82; Relative Strength: 0.94). **Conclusion**: The use of high or low loads during a strength training program with blood flow restriction characterized by a low-moderate degree of effort resulted in similar improvements in physical performance, except for vertical jump, where using high loads appears to produce additional gains.

Keywords: Velocity based training; Velocity loss; Occlusion training; Physical performance.

Relationships for physical performance and interlimb asymmetries between multiple field-based tests: Is there an influence of maturity status?

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Abstract :A wide range of field-based tests have been proposed to assess different key components of physical performance and interlimb asymmetries in youth athletes. However, the restricted testing time and human resources in applied settings may require coaches to prioritise some of them. The knowledge of potential relationships between these tests, as well as their interaction with maturity status, may assist coaches' decision making to design the most efficient (maximum information in the shortest amount of time) battery in youth soccer. Therefore, the aim of this investigation was twofold: (1) to determine the correlations between players' performance and interlimb asymmetry for different field-based tests, and (2) to examine the influence of maturity status on test performance and asymmetry results. Three hundred and nine male youth (10-19 years old) soccer players were assessed of the following tests: y-balance, countermovement jump, single leg countermovement jump, drop vertical jump, standing long jump, single leg hop for distance, Illinois agility test, 10 m sprint, and 20 m sprint. The results of this study revealed moderate-to-very large correlations between all jump, sprint and agility performances, but weak-to-moderate relationships between these tests and balance measures. By contrast, no relevant relationship for interlimb asymmetries detected through different unilateral tests was reported. Physical performance in the different tests was clearly influenced by players' stage of maturation; howerver, a limited impact of maturity status on the magnitude of interlimb asymmetries was evident. Although the moderate-to-very large correlations in performance scores might illustrate a similar sensitivity to training for jumps and multidirectional sprints, the low shared variance suggest that these tests would be assessing different abilities and should not be used interchangeably. The influence of maturity status on players' physical performance emphasise the necessity of considering growth and maturation when comparing and interpreting test results.

Keywords: associated football, screening, assessment, young, maturation.

Monitoring of Training Load Control of Aerobic Gymnastics Athletes During the Pandemic

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Abstract: During the COVID-19 pandemic, social isolation prevented athletes from maintaining their usual training routine, and one of the alternatives found was to adapt training sessions to be indoors. In order to assist and supervise the athletes, the technical committee of the Brazilian Aerobic Gymnastics Team organized itself to provide training through online platforms. The present study aimed to monitor the training load of these athletes for six weeks and assess whether it was adequate. The research was composed by 6 athletes (25 years ± 5.2), of both sexes, collected the duration and RPE of each training session. From the values found, the Internal Training Load (ITC), the Strain and the Monotony were calculated. Data were evaluated through descriptive analysis using the excel program and subsequently an analysis of variance using the ANOVA test for repeated measurements. Week 3 had a statistical difference between the other weeks in the ITC variable and week 6 also showed a difference, however there was no difference between week 3 and week 6 (p*0.165). It was observed that the Monotony value did not exceed the value proposed in the literature, above 2.0 AU, and that the training load variance was well distributed over this period, where the highest average was 480 AU. and lowest 153 A.U., with the lowest values being characterized by regenerative weeks. The methods used to monitor the training load in the current reality, was suitable for training control, not to be too high and cause injury and too low to not have adaptation, where Monotony kept the values below 2 AU. and with statistical differences between weeks.

Keywords: Aerobic Gymnastics; Load Monitoring; Internal Training Load; Sports Training Pandemic

Comparison between different methods of calculating dynamic strength index: Effect on training recommendations

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Abstract: An impulse based dynamic strength index (iDSI) considers time-dependent force expression in contrast to the common peak force-based DSI (fDSI) may be more insightful when considering training recommendations. However, a limitation of the iDSI is that any change in countermovement jump (CMJ) propulsion phase duration (PPD) could interfere affect longitudinal comparisons, hence a fixed duration (e.g., 250 ms) iDSI could overcome this limitation. The purpose of the study was to determine the effect of different methods of calculating DSI (fDSI, iDSI matched, iDSI fixed). Thirty-eight team sport athletes (female = 13, male = 25, age = 22.2±2.8 years, height = 174.4±6.0 cm, mass = 74.9±11.9 kg) performed three maximal CMJ and three isometric mid-thigh pull (IMTP) trials on force plates sampling at 1000 Hz. Data was analysed using a custom spreadsheet. IMTP peak force and CMJ peak propulsive force and PPD were identified. Fixed iDSI was identified from IMTP onset-200 ms, while matched iDSI was identified from IMTP onset-matched to CMJ PPD. Participants were characterised using thresholds >0.80, 0.60-0.80 and <0.60 for maximal force, balanced, and dynamic force-based training, respectively. Mean±SD of fDSI, fixed iDSI and matched iDSI were 0.82±0.12, 0.88±0.11 and 0.82±0.11, respectively. Fixed iDSI was significantly and meaningfully greater than both fDSI and matched iDSI (p<0.049, d>0.408), with no difference between the latter (p=1.000, d=0.007. There were large intra-individual differences in the training recommendations, 44.7% of the recommendations were consistent between fDSI and matched iDSI and 55.3% were consistent for fDSI and fixed iDSI. In contrast, there was a greater consistency in training recommendations between fixed iDSI and matched iDSI (84.2%). Despite the consideration of time-dependent force expression in iDSI calculations there are meaningful differences in their observations. This difference should be considered when tracking physical performance over time, where a fixed iDSI could be preferential to be consistent. However, iDSI calculations could require specific thresholds to appropriately categorise athletes for specific training recommendations.

Keywords: force; impulse; countermovement jump; isometric mid-thigh pull; propulsive phase

Maximal fat oxidation capacity and FatMax are related with body composition but not with triglyceridaemia in Type 2 Diabetes Mellitus patients.

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Abstract: Maximal fat oxidation capacity (MFO) and the relative intensity of VO_2max where it occurs (FatMax) are impaired in people with metabolic diseases as Type 2 Diabetes Mellitus (T2DM). Additionally, MFO and FatMax are related to body composition and blood substrate availability. Nevertheless, the association between body composition and blood substrate availability and the influence of triglyceridemia have been poorly studied in the T2DM population. A cross-sectional study was conducted on 99 T2DM patients (men=61). MFO and FatMax were assessed by indirect calorimetry with a gradual test with 15W increments every 3 minutes until RER achieved 1. On fasting condition, blood extraction was conducted and body mass (BM), lean mass (LM), muscle mass (MM) and fat mass (FM) were measured using a multifrequency bioimpedance following these considerations: i) to refrain from vigorous exercise 24h before, ii) to avoid alcoholic or energy drinks 24h before, iii) to be in a fasting state for 8h. Significant correlations were found between MFO and BM ($p<0.001$, $r=0.485$), FM ($p<0.05$, $r=262$), LM ($p<0.001$, $r=0.518$) and MM ($p<0.001$; $r=0.515$). Also, FatMax was associated with BM ($p<0.005$, $r=0.291$), fat percentage ($p<0.05$, $r=0.209$) and FM ($p<0.005$, $r=0.285$). Results showed that MFO and FatMax are correlated with body composition in T2DM patients. MFO is correlated with BM, FM, LM and MM but FatMax only correlates with BM and FM. This findings suggest that muscle, as a metabolically active organ, contributes to higher rates of fat oxidation but not modifies the FatMax point. Neither MFO nor FatMax were associated with trglyceridaemia.

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Keywords: maximal oxidation capacity, FatMass, Type 2 Diabetes Mellitus, body composition, lipidic profile

Reproducibility of vertical jump measurement from two methods: a pilot study

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Abstract: The explosive strength of the lower limbs is one of the important physical variables for athletic/sports performance, especially in modalities that require constant acceleration and changes of direction. To estimate the explosive force, vertical jump tests are used. One of them is the vertical thrust test (PR), which is practical, easy to perform and inexpensive. Another test is the contact mat (PS) that estimates the explosive force utilizing the height of the vertical jump, calculated by the time of flight, and the body mass of the jumper. The problem of the present study lies in knowing whether the PR is valid in comparison with the PS and what would be the reproducibility of the measurement of these tests. Thus, this study aimed to analyze the reproducibility and compare the existence of agreement/discrepancy between two vertical thrust tests. The study included 20 males (21.60±3.75 years; 76.05±15.91 kg; and 1.78±0.06 m). The volunteers were submitted to two vertical jump evaluations, PR and PS simultaneously, on two different days, with an interval of 48 hours, under the same conditions and at the same time of day. The results were analyzed by calculating the coefficient of variation (CV) and the intraclass correlation coefficient (ICC) with a 95% confidence interval (95%CI) and a significance level of 5%. The main results were, for both tests, a "low" CV (PS= 5%; PR= 7%) and an ICC with "high" to "very high" agreement strength (PR= 0.854; CI95%=0.668;0.939; $p<0.001$; PS=0.917; CI95%=0.804;0.966; $p<0.001$). It's concluded that both PS and PR tests presented high concordances, with excellent reproducibility of their measurements. Thus, in the absence of a more sophisticated instrument such as the contact mat, the PR can be used as an instrument to estimate the explosive strength of the lower limbs.

KEYWORDS: Health; Muscle strength; Muscle power; Vertical jump.

Kinematic analysis of the supporting lower limb in the handball shot without impulse between amateur vs professional players

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Abstract: The handball shot represents the technical gesture that all handball athletes use to score a goal, and is sometimes understood as a mere shot (set of movements) which is not true. The handball shot includes a set of techniques and muscular adaptations necessary for the optimization and efficiency of the movement. Thus, we intend to analyze the technical gesture of handball shooting between professionals and amateurs. Methods: 8 amateur athletes (GA: 20 ± 2.57 years; 172.2± 8.27cm; 62.2 ± 11.78kg) and 1 professional athlete performed a shot without impulsion on the 7-meter line. Results: In the initial phase of the shot the professional athlete recorded 175 degrees of amplitude and the other athletes recorded 176 ± 3.40 degrees, in the shot phase the professional athlete recorded an amplitude of 125 degrees while the other athletes under study recorded 160 ± 9.25 degrees. Finally, the ball speed was recorded from the moment it left the athlete's hand and the results for the professional athlete was 12 m/s while for the experimental group it was 12.2 ± 2.65 m/s. Conclusions: There were no considerable velocity variations between the professional athlete and GA during the shot.

Keywords: Biomechanics, Kinematics, Handball shooting, Movement.

Track start in athletics between amateur vs national level athletes

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Abstract: The track start is fundamental for performance in athletics. Thus, we intend to analyze the track start movement of the blocks match between inexperienced and experienced athletes trying to verify if the execution technique has influence on the result. Methods: We analyzed 8 athletes, being 4 amateurs (GA: 26.25± 15.48 years; 63.13± 6.64kg) and 4 with national experience (GN: 19.75± 2.22 years; 166.75±3.50cm; 62.56±6.38kg; 167±10.40cm). Both groups performed a 5-meter straight line with and without blocks and data such as speed and acceleration were analyzed. The GN had an average speed of 2.11±0.18m/s and the GA an average of 1.77±0.39m/s. The average acceleration of the GN was 2.24±1.02m/s and of the GA was 3.19±1.07m/s. Conclusions: In conclusion, after kinematic analysis of the athletes we observed that in 5 meters the efficiency of the technique does not create a large discrepancy in the results.

Keywords: Biomechanics, Kinematics, Athletics Track Start.

Impact of the jump in the performance of the free throw in amateurs athletes

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Abstract: The free throw in basketball is one of the techniques that allows teams to accumulate points in order to win. This way we intend to perform a kinematic analysis of the free throw without and with jump in order to analyze the differences between the joint amplitudes of our participants. Methods: 7 amateur athletes (22.8±5.9 years; 66±7.6 kg; 1.73±0.08 cm) and 1 professional athlete performed 1 free throw with jump and another without the jump. Results: In the free throw without impulse, in its positioning phase to the throwing phase there was a variation of the knee joint from 125.7±19.34 to 169.2±8.82 and in the elbow joint it was recorded from 85.5±11.1 to 168±8.61. However in the free throw with impulsion it was found that the angular variation of the knee joint was 112.4± 12.15 to 167.3±6.7 and in the elbow joint was 86.1±10.5 to 164.5±10.6. Conclusions: After the kinematic analysis of the exercise group, it can be seen that the angular difference does not disperse significantly between the free throw with impulsion and without impulsion.

Keywords: Biomechanics, Free Throw, impulse, basketball

Kinematic analysis of the layup in basketball between experienced and amateurs athletes

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Abstract: Background: The step throw is the most likely to hit the shot because it allows the ball to leave the player's possession when he is as close as possible to the basket. The objective of this study was to analyze the effect of experience in the execution of the step throw in athletes with experience in the practice of the sport and athletes who did not practice basketball. Methods: Six experienced athletes (20.5±1.97 years; 76.67±15.06 kg; 185.5±6.66 cm) and six amateur athletes (20.17±0.98 years; 72.33±8.89 kg; 180.5±5.43 cm) made a step throw. Results: In the amateur athletes it was recorded in the knee joint 146.35±11.79 degrees at the moment of the first stride, 150.2±9.58 degrees at the moment of the second stride, 175.7±5.47 degrees at the moment of the impulsion and in the elbow joint 153±9.78 degrees at the moment of the throw. In experienced athletes it was recorded in the knee joint 152.37±6.20 degrees at the time of the first stride, 135.63±4.49 degrees at the time of the second stride, 173.48±4.90 degrees at the time of impulsion and in the elbow joint 164.90±5.64 degrees at the time of the throw. Conclusions: After the kinematic analysis of throwing in the stride in basketball between experienced and amateur athletes, we observed that there were significant changes at the moment of the second stride and at the moment of throwing the ball to the basket, that is, these two moments lead to greater efficiency in the movement.

Keywords: Biomechanics, basketball, step throw, kinematics

Kinematic analysis of the Back Squat Smith Machine at angles of 45 degrees and 90 degrees to the knee joint.

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Abstract: Background: Squatting is a natural movement of human beings. The down position is the posture that nature understands we must stay in to be seated, and standing up (leaving the seated position) is the biomechanical method programmed to get up being the squat a technical gesture also used to improve sport performance. This way, we intend to analyze kinematically the differences when the squat is done at 45 degrees and 90 degrees, in a group of sport students, in order to compare the execution speed, the hip joint angle and the ankle joint angle, taking into account the ascending and descending phase of the movement. Methods: 6 sports practitioners (exercise group: 21± 1.77 years, 66 ± 8.04 kg, 1.74 ± 0.08 m) performed one repetition of the Back Squat Smith Machine at 45 degrees and one repetition at 90 degrees. Results: The ascending and descending phase of the Back Squat at 90 degrees presented in the execution speed a variation of : ascending phase: 0.83 ± 0.11 sec; descending phase: 1.12 ± 0.10 sec; in the hip joint it presented a variation of 93.2 ± 8.22 degrees and in the ankle joint a variation of 91.8 ± 6.88 degrees. The ascending and descending phase of the Back Squat at 45 degrees presented in execution speed a variation of 1.32 ± 0.25 sec and 2.05 ±0.34 sec in the ascending and descending phase, respectively. Conclusions: The angular capacity of the hip and ankle joints are fundamental for a correct execution of the technical gesture at 90 degrees and 45 degrees. The greater the flexibility in these joints the greater the angular capacity to perform the Back Squat Smith Machine at 45 degrees.

Keywords: Biomechanics, back squat, strength training

Kinematic analysis of the volleyball service with impulse and without impulse

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Abstract: Background: The volleyball service, consists of a player starting the game itself by throwing the ball in the air and then hitting the ball with his hand, towards the opponent's court, trying to make the ball go over the net and fall into the opponent's court. The serve is considered one of the most important techniques in volleyball, as it can have a significant impact on the team's performance during the match. Thus, we aimed to analyze a kinematic analysis of the upper limbs (MS) and lower limbs (LL) in both the service with impulsion and the service without impulsion. Methods: 6 inexperienced athletes (exercise group: 19±1.26 years; 74.50±8.38 kg; 178.83±0.085 cm) and 1 experienced athlete (19 years; 62.5 kg; 173 cm) performed 1 serve without impulsion and 1 serve with impulsion. Results: In the service without impulsion in the preparatory phase the inexperienced athletes presented an average angular average in the knee joint of 154.75±19.78 degrees, whereas the experienced athlete presented the following value 157.7 degrees. In the subphase, that is, the complementary movement and more specifically in the elbow joint, the inexperienced athletes presented values of 128.98±20.92 degrees, while the experienced athlete presented the value of 81.9 degrees. In the main phase and the angle of the elbow joint when it comes into contact with the ball, the inexperienced players had a value of 142.00±17.66 degrees, while the experienced player had a value of 122.1 degrees. On the other hand, the ball speed on the serve of inexperienced athletes was 12.41±2.53 m/s and the ball speed on the serve by the experienced athlete was 14.87 m/s. The speed of the ball in the service with impulsion where the inexperienced athletes presented values of 12.94±1.68 m/s and in contrast the experienced athlete presented the value of 14.95 m/s. Conclusions: The service without impulsion in the inexperienced athletes presented a larger angular amplitude, however the ball presented a larger velocity in the inexperienced athletes in the service with impulsion.

Keywords: volleyball serve; kinematics; biomechanics

Kinematic analysis of the long pass on football compared to the shot

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Abstract: Background: The long pass and the shot are two technical gestures in football that are extremely important, a good execution of them can define the result of a game. In this way, we intend to carry out the kinematic analysis of the long pass and the shot in a group of amateur athletes in order to understand the differences in execution between them in the 4 phases of each technical gesture. Methods: eight amateur athletes (exercise group: height 175.9±4.65 cm; weight 69.3±4,51 Kg; age 20.7±1.58 years) performed long pass and shot. Results: Pass average 124.34±29.15 degree angle; Average Shot 129.96±45.95 degree angle. Conclusions: In the long pass, the result shows a lower standard deviation than in the shot, which means that the shooting technique differed more than the passing technique among the athletes.

Keywords: Biomechanics; Kinematic; Football; Long pass; Shot.

Kinematic analysis of the side kick in karate

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Abstract: Background: Abstract: Background: The karate side kick (mawashi geri - "mauachi guéri") is a circular kick performed with the leg. This is the basic leg technique that is taught and imparted to beginners because it provides the necessary foundation for the athlete to later learn other more advanced kicks. It is necessary to develop strength, balance, and flexibility in order to apply said strength to the kick. Thus, we decided to perform a comparative analysis between federated athletes in the execution of this kick and amateurs who had never performed this technical gesture or had little experience in its execution. Methods: Eight athletes with experience in performing the lateral kick (exercise group: 18.4 ± 0.7 years; 61 ± 5.2Kg; 1.71m ± 0.1m) and eight athletes without experience (exercise group: 18.75± 1.1 years; 59.4± 5.4Kg; 1.74± 0.1m) performed the lateral kick. Results: The preparation phase for the kick, of the eight experienced athletes, presented, in the attack leg an angle of 164.3± 5.3°, in the impulsion and rotation phase, the attack leg presented an angle of 90.8±10.5°, finally in the extension/final phase the attack leg presents an angle of 178.4± 2.3°. For the eight athletes without experience the results were different: 152.3± 11.4° in the preparation phase, 56.9± 21.8° in the impulsion and rotation phases, and 172.8±6.2° in the extension/final phase. Finally, the experienced athletes had a foot height to the ground of 1.39± 0.1m and the inexperienced athletes had a foot height to the ground of 1.29±0.1m. Conclusion: After analyzing the angles that the attack leg forms and the height of the foot from the ground, we concluded that there were clear changes in the technical gesture of the kick taking into account the experience of some against the inexperience of others.

Keywords: kinematics; biomechanics; mawashi geri

Kinematic Analysis of Conventional and Sumo techniques in the deadlift

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Abstract: Background: Deadlift is the safest and most correct movement for lifting a load from the ground. It requires the action of several muscle groups, mainly in the lower limbs and lower back. It is integrated in the training of millions of athletes and its most used techniques are subject to great controversy. With the kinematic analysis of both techniques (conventional and sumo) we intend to infer how they influence the muscle action in the deadlift and thus adapt the technique used according to the training objective. Methods: Ten amateur athletes (exercise group: 1.74±0.08 m; 73.8±14.4 kg) performed one repetition of conventional deadlift followed by one repetition of sumo deadlift with the same load. Results: The initial and final phases of the upward movement of the conventional deadlift showed on average in the knee joint a variation of 78.2±17.32 degrees and in the hip joint 124.2±8.60 degrees, a velocity of 0.53±0.15 m/s and an amplitude of 0.74±0.05 m. In the sumo deadlift we noticed an average variation of 79.5±16.74 degrees in the knee joint and 115.8±11.56 degrees in the hip joint, a velocity of 0.48±0.11 m/s and an amplitude of 0.70±0.04 m. Conclusions: There is no change at the knee level, but due to the smaller angular variation in the hip and amplitude value, the sumo deadlift requires less lumbar work. The techniques are very similar and the differences are negligible at the amateur level.

Keywords: Kinematics; Biomechanics; Deadlift; Strength Training; Movement.

Kinematic analysis of shot with e without acceleration

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Abstract: Abstract: The shot is a technical gesture of great motor complexity that needs to be well adjusted to the variables of the game, and should be performed at the appropriate time and place, and requires a high level of explosive force. In this way we intend to realize a kinematic analysis to observe the difference of the shots with and without acceleration where we observed 4 infantile athletes of the Paio Pires Football Club. Methods: 4 athletes (exercise group: 11.5±0.57735 years; 50.25±12.68529 kg;156.75 ±7.36546 cm) each performed two shots, one with initial running (acceleration) and one without acceleration. Results: The initial and final phase of the movement of the paddles with acceleration showed a variation in the knee joint of 139.975±22.44822 degrees. In the initial and final phase of the backstroke movement without acceleration, the knee joint had a variation of 154.8±15.3 degrees. Conclusions: After the kinematic analysis we observed that the 4 athletes have similar values when they perform the shot with acceleration. When the shot is performed without acceleration, the values vary from athlete to athlete.

Keywords: Biomechanics; Shooting, Kinematics, Movement, Soccer;

Kinematic analysis of the upper and lower limbs in the basketball's three-point shot performed with both hands

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Abstract: Background: Three-point shooting in Basketball is the act of shooting to the basket behind a line marked on the floor that will add the value of 3 points to the score of the team that made it. Currently, the three-point shot is considered the most important shot in the game of basketball and due to its importance, the movement or act of shooting encompasses the participation of several muscle groups during its execution. Therefore, we analyzed the action of the upper and lower limbs in the execution of the shot with both hands in a group of amateur athletes, in order to understand the differences of the execution of the 4 phases of the shot using the dominant hand and the weaker hand. Methods: Eight amateur athletes (exercise group: 19.87±1.95 years; 72.62±11.32 kg; 179.62±5.20cm) perform one repetition of the throw with the right arm and another with the left arm. Results: The initial and final phases of the right arm throw movement varied in the knee joint from 109.43±19.34 to 166.81±5.31 degrees and in the elbow joint from 75.92±22.83 to 153.38±24.02. With the left arm the knee joint varied from 109.62±15.31 to 170.43±5.48 degrees and the elbow joint from 77±17.64 to 163.7±12.09 degrees. Conclusions: There are changes in the technical gesture between left and right hand due to the fact that within the exercise group there are athletes with different dominant hands, so some will perform better the technical gesture with the right hand and others with the left hand.

Key-words: tree-point shot; basketball; biomechanics

Use of Nutritional Supplements in Turkish Elite Skiers: Preliminary Data

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Abstract: Winter sports athletes challenge with increased energy expenditure, glycogen utilization, and fluid loss due to cold environmental conditions. Nutritional supplements (NS) may provide various benefits such as improved health or performance, more effective training, and a direct performance advantage to winter sports athletes such as skiers. This study aims to investigate NS consumption in Turkish elite skiers of different competition levels. Fifty-five elite male skiers completed the online specific survey about NS consumption, which included sections on demographics, sport/training, and NS consumption. However, thirty participants were excluded from the study due to being under the age of 18. Surveys of 25 elite athletes were analyzed (44.0% of all in national competitions vs. 56.0% of all in international competitions). The disciplines of participants were alpine skiing (76.0%), cross-country skiing (20%), and snowboarding (4%). 88.0% (n=22) of the participants declared that they consumed at least one supplement. The mostly consumed NS were vitamin D (16.0%), green tea (16.0%), omega-3 fatty acids (12.0%), vitamin C (12.0%), caffeine (12.0%), and whey protein (12.0%). The major reasons for NS consumption were to increase sports performance (32.0%) and to take care of health (24.0%). The most common sites of purchase were pharmacies (32.0%) and the Internet (16.0%). The main sources of NS-consuming motivation were physicians (24.0%) and self-advice (20.0%). NS consumption moderately appeared among Turkish male skiers. Unconscious or excessive use of NS may impair performance and pose a risk to the health of the winter sports athlete. Therefore, it should be questioned medically, physiologically, culturally, and ethically whether the athletes have the necessary knowledge to make an informed choice in future studies.

Keywords: ergogenic aids; skiing; nutrition; sports performance; supplementation

Study protocol for the implementation of a walking football programme: observation of effects according to gender.

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Abstract: Walking Football was a sport adapted from traditional football created in the UK to combat physical inactivity and reduce government costs. It emerged as a different alternative to improve health, fitness and quality of life for people over 60, both men and women. This activity could be beneficial for their health and social relations. The Faculty of Sports of the University of Extremadura carried out a study protocol aimed at increasing physical activity in these groups. It was proposed to measure body composition, aerobic endurance, upper body strength, lower body strength, speed-agility, flexibility, health-related quality of life and happiness. The proposal involved a randomised controlled trial, with a mixed experimental group of men and women, to ascertain gender-specific benefits. The main added value was the acquisition of new knowledge on the application of a novel method of Walking Football programmes in women, as most previous studies focused on men. Although the study was in progress, it was hoped to obtain significant differences in the variables described and to be able to demonstrate that Walking Football could be a beneficial and inclusive practice for both women and men.

Keywords: Adapted sport, health, inclusion, older people, physical activity;

Gender-specific associations between oxidative stress and appetite hormones in young adults

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Abstract: Introduction: Recent studies have demonstrated that oxidative stress can impact appetite by modulating appetite hormones. Investigating the association between oxidative stress and appetite hormones in young adults, with a focus on gender differences, could reveal insights into the potential mechanisms linking oxidative stress to metabolic disorders and obesity. **Methods:** A total of 73 young adults (29 women, 22.88±4.61 years) were included in this study. We measured oxidative stress markers (catalase, superoxide dismutase, glutathione peroxidase, glutathione, malondialdehyde, and advanced oxidation protein products), as well as appetite hormones (plasma ghrelin, leptin, gastric inhibitory peptide, Glucagon-like peptide-1, and Peptide YY). We applied single linear regressions, divided by sex. **Results:** We found a significant positive association between plasma leptin levels and catalase activity in both men (β=0.483, p=0.002) and women (β=0.621, p=0.003). In men, higher levels of ghrelin were significantly associated with lower levels of superoxide dismutase (β=-0.313, p=0.041), and higher levels of glucagon-like peptide-1 were associated with lower levels of glutathione. In women, higher levels of advanced oxidation protein products were significantly associated with higher levels of ghrelin (β=0.474, p=0.035). **Conclusions:** Our findings suggest that the associations of oxidative stress on appetite hormones vary between men and women, with different hormone-antioxidant associations identified for each sex. These results may have important implications for the development of interventions targeting metabolic disorders and obesity, particularly those taking into account gender-specific differences in response to oxidative stress. Project funded by MCIN/AEI/ 10.13039/501100011033, grants PID2019-110063RA-I00 and PID2020-120034RA-I00, and funded by Supreme Council for Sports, grant EXP_74977

Keywords: Oxidative stress, Appetite, Gender differences, antioxidants, Metabolic disorders

Preliminary study comparing handgrip strength in older adults before and after an educational intervention on healthy lifestyle habits: FRAGSALUD Project.

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Abstract: Frailty is defined as a state in which there is a loss of physical and mental function, increasing the person's risk of dependence and og suffering, for example, falls or illnesses. Interventions that promote a healthy lifestyle are necessary to improve the health of this population and slow the progression of frailty. Physical frailty, specifically manual pressure strength, has been proposed as an indicator of interest and easy application. The aim of this study was to assess the impact of a educational intervention on hangrip level in frail and prefrail older adults. A total of 118 participants (age: 74.84 ± 7.34) who where classified as frail or prefrail according to fried criteria were randomizen into the intervention group (n=64) or control group (n=54). The intervention group (IG) received 1 talk per week for 1 month on healthy lifestyle habits. Subsequently, they received 1 monthly follow-up call for 6 months. After these months, they were re-evaluated for frailty status. Hangrip was assessed by a dynamometer (Takei tkk5401). The factorial 2x2 analysis of variance showed that the IG improved the hangrip level with a p-value close to significance (p=0.059), while the cg maintained similar values. These findings suggest that working on strength is very important in the elderly. That the intervention was effective in slowing the reduction in strength associated with aging and frailty. The fragsalud project will include a larger sample to achieve greater statistical power.

FRAGSALUD Project, funded by 10.13039/501100011011, reference UMA20-FEDERJA-154)

Keywords: Ageing, Health-related Quality of life, older adults, psychological well-being, exhaustion.

Asociación entre valores de fuerza manual y capacidad cardiorrespiratoria en pacientes con diabetes mellitus tipo 2

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Abstract : Interleukin-6 (IL-6) and C-reactive protein (CRP) are blood markers used to determine the inflammatory profile in patients with type 2 diabetes mellitus (T2DM). The aim of this study was to examine the relationship between IL-6 and CRP levels with the level of physical fitness and health in subjects with T2DM. A total of 95 subjects (53 males) diagnosed with T2DM were included in the study. Plasma levels of IL-6 and CRP were obtained through a baseline blood analysis. Maximal oxygen consumption (VO_2 max) was obtained through an incremental test on a cycle ergometer using indirect calorimetry. Handgrip strength was measured using a dynamometer (Takei tkk5401). Body mass index (BMI) was calculated using the participants' weight and height. A linear regression model was used to determine the relationship between inflammatory markers and the other parameters analyzed in the study. Linear regression analysis showed a significant association between IL-6 levels and BMI (β=0.279; p=0.007). Furthermore, CRP levels were significantly associated with BMI (β=0.332; p=<0.001), handgrip strength (β=-0.415; p=0.030), and VO_2 max (β=0.282; p=0.041). The results of this study demonstrate that patients with T2DM with higher BMI levels displayed a higher inflammatory profile. However, higher levels of handgrip strength were associated with a better CRP profile. This highlights the importance of using physical exercise as a tool to impact inflammatory parameters in individuals with T2DM.

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Keywords: Inflammation, health status, body composition, metabolic disorders, diabetes

Association between HbA1c and cardiovascular risk factors in adults with type 2 diabetes: The EDUGUTION/APETEX project.

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Abstract: Introduction: Glycosylated haemoglobin (HbA1c) is a crucial biomarker used for assessing long-term serum glucose and evaluating the risk of complications in diabetes patients. Recent studies have found that HbA1c levels in diabetic patients are associated with various parameters of cardiovascular events. The aim of this cross-sectional study is to investigate the relationship between HbA1c and different cardiovascular risk factors in adults with type 2 diabetes (T2D). Methods: In this preliminary analysis of the EDUGUTION and APETEX projects, a total of 71 adults (45 men; 55.90±7.28 years) with T2D from the province of Cadiz (Spain) were analysed in this cross-sectional design. On fasting condition, anthropometric variables (waist circumference, weight, and height), body mass index, blood parameters (HbA1c, vitamin D, C-reactive protein, cholesterol, HDL, and LDL), and blood pressure were measured. Bivariate correlations and a linear regression model were applied to study the association between HbA1c and cardiovascular risk factors. Results: The results of linear regression model indicated a significant association between HbA1c levels and cardiovascular risk factors, including HDL cholesterol (β=−0.244; R^2= 0.059; p=0.041) and blood pressure (β=−0.303; R^2= 0.092; p=0.010). Moreover, positive correlations were reported between HbA1c levels and C-reactive protein (r=0.204; p=0.044), Vitamin D (r=-0.173; p=0.075), and waist circumference (r=0.181; p=0.050). No significant associations were observed between HbA1c levels and the rest of outcomes. Conclusion: The findings of this study suggest that higher HbA1c levels are associated with an increased risk of cardiovascular events in adults with T2D, highlighting the importance of monitoring HbA1c levels in these patients and managing cardiovascular risk factors to reduce the risk of complications. Further studies with experimental design are encouraged to test the impact of physical exercise and diet on these outcomes in T2D.

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Keywords: Biomarker, glucose, HDL Cholesterol, blood pressure, C-reactive protein.

Comparasion of glycosylated haemoglobin after a training program and nutritional education in type 2 diabetes mellitus

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Abstract: Type 2 diabetes mellitus (T2D) and obesity are prevalent and rapidly increasing public health concerns globally. Exercise and nutritional education are commonly used interventions that have been shown to enhance blood glucose regulation in individuals with T2D. This study aims to investigate the effect exercise training and nutritional counseling on glycated hemoglobin (HbA1c) levels in adults with T2D. In this controlled clinical trial with a 12-week intervention, 62 adults with T2D and obesity (37 men; 55.9±7.3 years), were randomized into six groups according to nutritional counseling (Diet vs. NoDiet groups) and physical exercise program, consisting of high-intensity interval training (HIIT) or moderate-intensity continuous training (MICT) or maintaining their inactive levels (INACT) as controls. Thius, the groups were Diet+HIIT, Diet+MICT, Diet+INACT, NoDiet+HIIT, NoDiet+MICT, and NoDiet+INACT. Supervised physical exercise sessions were conducted three times a week on a cycloergometer. MICT consisted of 50 minutes at 10% over lactate threshold intensity, while HIIT consisted of 10 bouts of 1 minute over 90% of peak power with 1 minute of rest. Diet was balanced in macro and micronutrients with a caloric deficit of 350-500 kcal using personal interviews. HbA1c was measured under fasting conditions. The ANOVA test and Bonferroni were applied with statistical significance set at $p<0.05$. A significant time x diet interaction was found for HbA1c ($p=0.004$). A main effect of moment was found for HbA1c ($p<0.001$). After the intervention, the diet group presented a HbA1c of 5.6±0.3 while the NoDiet group showed a HbA1c level of 7.0±1.6. However, the physical exercise program did not present statistical significant results, either interactions. Our findings support the benefits of a diet intervention in the management in T2D, notwithstanding physical exercise may improve other heatlh markers. Funding: MCIN/AEI/10.13039/501100011033 (PID2019-110063RA-I00 and PID2020-120034RA-I00) and Supreme Council for Sports (EXP_74977).

Keywords: exercise, diet, glucose, physical activity, biomarkers.

The Importance of Sleep in Sport Perfomance

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Abstract: Introduction. The quality and the cuantity of sleep have a great impact on the physical performance of the athlete. An inadequate sleep pattern leads to an accumulation of fatigue that could alter cognitive performance, and may also affect the athlete's physical performance. However, it isn't known in depht how and what levels could sleep deficiencies affect sports performance. **Objetive.** The objective of this review was to analyze the effect of inadequate sleep quality and quantity on the sports performance of athletes. **Methodology.** A systematic review was carried out following the PRISMA methodology. A search was performed in the Pubmed database between February and March 2022, using the keywords: sleep, sports performance, deprivation, rest and physical activity. **Results.** Four of the analyzed studies in the sistematic revision showed that a with a four - hour of sleep deprivation there was a 4 – 10% decrease in athlete's perfomance, both in power and endurance. Likewise, in three other studies of the analysis, it was found that there were increases in the Perceived Exertion Scala (ERP) of the ahtletes, and in one of them, the perception of paind during the test was also altered. Another key parameter shown to be affected in one of the studies was a decrease in the amount of muscle glycogen, 65 mililiters per kilogram of body weight. This increased the level of fatigue in the athletes studied. **Conclusions.** A four hour sleep deprivation in the athletes produces several consequences at the physical and mental level, affecting sports performance and producing alterations in the athlete's mood and performance expectations.

Risk and Protective Factors for Depressive Symptoms in Older Adults with frailty. The FRAGSALUD project.

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Abstract: Introduction: Depression and frailty are prevalent in older adults, and their coexistence can lead to negative health outcomes. Understanding the potential outcomes associated with depression in frail participants is critical. Therefore, this study aimed to examine the associations between physical frailty, physical activity, nutritional status, and depressive symptoms in frail older adults. **Methods:** A total of 235 Spanish older adults (157 women, 74.4±7.77 years) with at least one condition of Fried's frailty phenotype. Physical frailty was assessed using the Short Physical Performance Battery, and physical activity using a wrist-worn accelerometer. Nutritional status was evaluated using body mass, body mass index, waist, arm, and leg circumferences, and the Mini-Nutritional Assessment (MNA). Depressive symptoms were assessed using the 15-item Geriatric Depression Scale, with scores higher than 4 indicating depressive symptoms. Logistic regression models were used to explore the relationship between depressive status and frailty status, physical frailty, physical activity, and nutritional status, in both unadjusted and adjusted models by sex. Odds ratios (OR) and p-values were reported. **Results:** Walking speed (OR=1.150, p=0.045) was identified as a significant risk factor for depressive symptoms. Conversely, moderate physical activity (OR=0.988, p<0.029), arm (OR=0.934, p<0.047), and leg (OR=0.903, p<0.003) circumferences, and MNA score (OR=0.616, p<0.001) were identified as protective factors for depressive symptoms in both unadjusted and adjusted models. **Conclusions:** This study highlights that a slower walking speed is a significant risk factor for depressive symptoms, while higher levels of moderate physical activity, and better nutritional status serve as protective factors. The results emphasize the importance of promoting moderate physical activity and optimizing nutritional status to prevent or alleviate depressive symptoms in frail older adults. Project funded by 10.13039/501100011011, reference UMA20-FEDERJA-154.

Keywords: elderly, nutrition, physical activity, frailty phenotype, depression

Quality of Life is related to frailty status assessed by Fried's criteria: The FRAGSALUD Project.

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Abstract: Frailty is defined as a state associated with aging, characterized by a decrease in physiological reserve that results in an increased risk of disability and vulnerability leading to adverse effects such as a possible decrease in quality of life (QoL). The aim of this study was to determine whether there is an association between QoL and frailty status assessed by Fried's criteria. QoL was assessed with the EuroQol 5 Dimensions 5 Level (EQ-5D-5L) questionnaire which includes a visual analogue scale (VAS) from 0 to 100. Likewise, this questionnaire is used to calculate QoL index from 0 to 1 and frailty status was measured with Fried's criteria. This cross-sectional study included 235 older adults (age: 74.4±7.77 years) with frailty phenotype of whom 157 were women. Of the participants, 149 were pre-frail and 68 were frail and had a mean QoL Index of 0.88 ± 0.09 in the EQ-5D-5 L Index and 67.38 ± 18.78 in the VAS. A linear regression analysis showed that the EQ-5D-5 L Index is significantly associated with the criterion of feeling exhausted and fatigued 5-7 days a week (β= -0.461, $p<0.001$ and β= -0.276, $p=0.002$ respectively) and fatigued 3-4 days a week (β= -0.219, $p=0.020$). As for the quality of life measured with the EQ-5D-5 L VAS, the criterion of fatigue 5-7 days a week presented a significant association (β= -0.271, $p=0.018$). In conclusion, QoL is related to self-reported exhaustion and fatigue criterion. However, although scientific evidence associates physical function with better QoL, the Fried's physical criteria are not significantly related with QoL in prefrail and frail older adults.

FRAGSALUD Project, funded by 10.13039/501100011011, reference UMA20-FEDERJA-154)

Keywords: Ageing, Health-related Quality of life, older adults, psychological well-being, exhaustion.

Physical inactivity is associated with worse quality of life in older adults with pre-frailty or frailty. The FRAGSALUD project.

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Abstract: Frailty is a state of vulnerability in older adults who experience a decrease in functional capacity. Physical inactivity is a factor that can contribute to worsening the state of these individuals, increasing the risk of chronic diseases, and consequently worsening quality of life (QoL). The objective of this cross-sectional study was to analyze the association between inactive time and QoL in older adults with pre-frailty and frailty . Physical inactivity was recorded through accelerometry for seven consecutive days in 184 older adults (178 women, 74.26 ± 8.27 years) with pre-frailty and frailty according to Fried's criteria. Self-reported QoL was assessed through the EuroQOL-5D questionnaire and its visual analog scale (VAS). QoL index was obtained from the 5 items of the questionnaire plus the VAS, and the index ranges from 1 to 0, where 1 represents the best health status. Multiple regression analysis was used to examine the association between physical inactivity and QoL index, adjusting for age and sex. Our results showed a significant association between physical inactivity and the QoL index adjusted for age and sex (β=-0.18; R^2= 0.03; $p<0.03$), but no significant association was found between physical inactivity and VAS. Therefore, the frail/pre-frail older adults who spent more time physically inactive reported worse QoL. Our study highlights the importance of reducing daily inactivity and sedentary time. Thus, health promotion policies for older adults with risk of frailty are encouraged to advertise sedentary breaks and physical activity, also promoting social interaction as effective strategies to reduce physical inactivity. These interventions have the potential to improve physical function and quality of life, ultimately leading to better health outcomes and reduced healthcare costs. Further research is warranted to better understand the long-term benefits and sustainability of these interventions in this vulnerable population. FRAGSALUD Project funded by 10.13039/501100011011, reference UMA20-FEDERJA-154

Keywords: Elderly, Lifestyle, Accelerometer, Frailness, sedentary Behaviour

Associations between moderate-to-vigorous physical activity and quality of life in pre-frail and frail older adults. The FRAGSALUD Project.

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Abstract : Frailty is defined as a geriatric syndrome characterized by a decrease in physiological reserve and functional capacity, which significantly compromises the quality of life of fragile individuals. Physical activity can have a positive impact on the quality of life of people with frailty. Studies have shown that physical inactivity can worsen the state of these individuals and increase the risk of chronic diseases, which can worsen their quality of life. Cross-sectional study aims to analyze the association between time spent in moderate-to-vigorous physical activity (MVPA) and the quality of life of frail and pre-frail older adults. 184 older adults (178 women, 74.26 ± 8.27 years) with pre-frailty and frailty were recruited, and MVPA was evaluated using accelerometry for seven consecutive days. Quality of life was assessed using the EuroQOL-5D questionnaire and the EuroQOL-5D visual analog scale (VAS). QoL index was obtained from the 5 items of the questionnaire plus the VAS, and the index ranges from 1 to 0, where 1 represents the best health status. The statistical analysis was carried out using multiple regression adjusting for sex and age, with the significance level set at $p<0.005$. Results showed a significant association between MVPA time (128.25 ± 163.37 min/day) and quality of life index (0.88 ± 0.09), adjusting for age and sex ($\beta=0.18$; $R^2= 0.09$; $p<0.03$), but no significant association was found between MVPA time and VAS (64.39 ± 22.35). Based on the results of this study, the complete version of the quality of life tool should be applied, and although shortening the evaluation time by only using the VAS scale may seem appropriate, it would not be suitable for frail or pre-frail individuals as it is not associated with MVPA, which is a preventive variable for frailty.

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Keywords: Ageing, Frailness, Life Quality, Physical Activity, EQ-5D-5L

Does creatine supplementation affect the effectiveness of an eccentric training program with stretching in athletes with patellar tendinopathy?

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Abstract: Introduction: Patellar tendinopathy (PT) is a common injury in sport modalities that involves jumping, repeated sprints and changes of direction at high velocity. PT is characterized by knee pain and a decreased muscle strength performance. Eccentric exercises (EE) with stretching have been shown to reduce symptomatology. Creatine has enhanced higher muscular adaptations after strength training programs in healthy athletes. Thus, the aim of this study was to analyze the effectiveness of the addition of a creatine supplement to an intervention with EE and stretching on muscular power and pain in athletes with PT. Methods: Randomly, 26 federated athletes with PT were assigned to creatine group (Cr) or control group (C) (4 females and 9 males in each group). Cr and C participants executed 6 weekly EE sessions (3 sets of 10 repetitions of a single declined squat) and stretching of the knee flexors and extensors muscles. Additionally, Cr participants ingested 5 g/day of creatine (Creapure®). Body mass index (BMI), pain (assessed by the VISAP scale) and countermovement jump (CMJ) were analysed before and after 4 weeks. A repeated measures ANOVA (ANOVA-MR) with Post-Hoc Bonferroni adjustment was performed. Results: There were no differences in BMI ($p>0.05$) while for VISAP an effect for time ($p<0.01$), but not for interaction time·supplementation ($p=0.20$) was observed. In CMJ, it was observed a trend to statistical differences in the interaction time·supplementation ($p=0.06$), however it was reported a statistical increase performance only in Cr ($p<0.01$). Conclusion: Four weeks of EE and stretching are not sufficient to reduce pain and increase jump ability in athletes with PT, but creatine (5 g/day) could have additional effects on CMJ performance. This enhancement in CMJ without changes in BMI suggests greater neuromuscular adaptations when combined with an EE training program and stretching with creatine supplementation.

Keywords: ergogenic aids; injury; nutrition; physical therapy; supplementation

Effects of menstrual cycle phase on muscular strength and power of healthy young women.

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Abstract : The effect of the menstrual cycle on force and power production has been previously studied, however, the existing evidence does not allow us to draw a definitive conclusion about this topic. This research aimed to analyze the differences between luteal and follicular phases on muscular strength and power production through a systematic review and an experimental pilot study. The systematic review was made using Pubmed, Web of Science and SPORTdiscuss databases from January 2012 to December 2022, using the following keywords: Menstrual cycle and resistance exercise. In the experimental study, 5 resistance-trained women (age: 22.8±4.3 years; body mass: 64.3±11.2 kg) participated in a blind, randomized and crossover study consisting of 3 visits to the laboratory. After the initial familiarization session where 1 repetition maximum (1RM) was obtained, participants returned to the laboratory on two occasions, to perform a strength and power test consisting of 3 repetitions at 25%1RM, 2 at 50%1RM, 1 at 75%1rm and 1 at 90%1RM for bench press and back squat exercises in the follicular and luteal phase. In the systematic review, 21 studies were included and 12 of them showed significant differences between phases, while 9 did not report statistically significant differences. In the experimental study, statistically significant differences were found in luteal compared to the follicular phase at 50%1RM for peak power (Wpeak,+6.7%;P=0.008), mean power (+8.9%;P=0.016), peak velocity (Vpeak,+4.9%;P=0.003), mean velocity (Vmed,+9.1%;P=0.018) and RPD in back squat, while in bench press differences were found in in Wpeak (+7.8%;P=0.025), time to reach Vpeak (+6.1%;P=0.008) and Wpeak (+15.7%;P=0.018).This experimental pilot study seems to indicate that during the luteal phase, women could produce higher muscular strength and power compared to the follicular phase. Nonetheless, further research is needed to elucidate the influence of menstrual cycle effect on muscular strength and power performance.

Keywords: Menstrual cycle, strength, power, women, sex hormones.

Differences between anthropometric equations for muscle mass estimation.

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Abstract: The field of sports science has seen an increased interest in the estimation of muscle mass (MM), particularly among recreational strength trainers (1), leading to the development of different methods to evaluate them. Different tools are available to quantify muscle mass (2), among which anthropometry has shown the most adequate reliability/practicality ratio (3). Although it is widely used in the scientific field, few equations have been generated for the estimation of MM, and within which, it is not known which one offers the most reliable results and if these are equivalent among the available formulas. This study aimed to compare the MM values obtained using various anthropometric equations in healthy and active adult recreational strength trainers. A total of 130 physically active individuals aged between 18 to 45 years were included in the evaluation. The MM was estimated in kilograms using equations of Kerr, Lee, Poortmans and Matiegka. Statistically significant differences were observed in the values of MM obtained by the equations ($p<0.001$-0.001), as well as a lack of agreement between the MM estimating equations ($p>0.05$). In conclusion, there were significant differences in the MM values obtained from recreational strength trainers using different equations, indicating that the MM results obtained with the different formulas are not comparable with each other. This difference could be attributed to variations in sample size, participant characteristics, and analyzed variables. Therefore, it is recommended to use the same estimation equation while comparing individuals with reference tables, analyzing their progress, or studying them, as these equations are not interchangeable.

Keywords: body composition; equation; girths; anthropometry, muscle mass.

Effect of sexual activity on sports performance, on muscle damage, and on perception of effort. A pilot study in high-level male athletes conducted in the laboratory.

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Abstract: Precompetitive sexual activity has been considered a possible cause of reduced performance because it promoted calmness and a sense of relaxation. We hypothesized that optimal athletic performance that is influenced by a variety of factors, including pre-competition sexual activity. The purpose of this study was to investigate the effects of sexual activity on athletic performance in a cycle ergometer test, on muscle damage, inflammation, and Rate of Perceived Exertion (RPE) in highly trained athletes. Analysis of two test days performed in a laboratory setting, comparing a day without sexual activity (T1) with a day with sexual activity (masturbation) (T0) performed 30 minutes prior to the incremental exercise test and, with a one-week difference between T0 and T1. Twenty-one high-level male athletes (22.05 ± 1.42 years), consisting of 8 team players, 7 endurance athletes, 4 judoists, and 2 boxers, participated in the study. Each subject completed the following on each test day: One incremental exercise test. Biomarker blood samples were obtained (lactate dehydrogenase (LDH), creatine kinase (CK), Myoglobin (Mb), C-reactive protein (CRP), lactate concentration (LAC)). Also, the following were assessed cardiac activity (HR), relative power (RPw), total test time (TT), and RPE (Borg-CR10) were monitored. Significantly ($p \leq 0.05$) greater differences were achieved for TT, HR, and LDH values and a non-significant ($p \geq 0.05$) greater trend in RPw and RPE after sexual activity. In addition, a non-significant ($p \geq 0.05$) lower difference was observed for LAC, CK, Mb, and RPE at T1. These findings would demonstrate that masturbation-induced orgasm could have positive acute effects by increasing athletic performance, attenuating muscle damage, and decreasing response to physical exertion in highly trained male

Keywords: abstinence, sports performance, sex, muscle damage, perceived exertion

Does the supplementation of different doses of caffeine interfere with muscular endurance?

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Abstract : Caffeine is a nutritional ergogenic resource that causes effects mainly on the central nervous system, blocking adenosine receptors. Through these actions, its supplementation can promote increased strength and muscle endurance during resistance exercise (TREXLER et al., 2016). Therefore, the study aimed to verify whether the different doses (210 mg and 420 mg) of acute caffeine supplementation interfere with the performance of a neuromuscular resistance test. The study included 11 male volunteers (25.7 ± 5.9 years; 71.1 ± 11.0 kg; 170.72 ± 6.6 cm). In all, there were 6 face-to-face visits, where the first one involved the delivery of the informed consent form, collection of anthropometric measurements (weight and height) and the 1RM test for the bench press exercise (SR). The second visit (Baseline (BA)) 48 hours after the first, contour with the muscular endurance test in the SR with 80% of 1RM, following the recommendations of Hall et al (2021). The other visits (third, fourth, fifth and sixth) relied on caffeine supplementation low (CB = 210 mg) and high (CA = 420 mg), or placebo low (PB = 230 mg) and high (PA = 460 mg) 60 minutes of pre-test. The interval between visits from the third was 7 days. Descriptive statistics and Scheffé Post-Hoc test were used with a significance level of $p<0.05$. No differences were found ($p > 0.05$) when all conditions occurred between them, but caffeine supplementation (CB = 12.09 ± 3.33; CA = 11.91 ± 3.53 reps) showed an increase in number of repetitions compared to BA (10.18 ± 2.71 reps), achieved muscular endurance. Consider that caffeine influenced the performance of the test, increasing the muscular resistance of a resisted exercise.

Keywords: Caffeine; Resistance training; Supplementation; Muscular endurance; Muscle strength

Is it necessary to reach muscle failure to maximize quadriceps muscle architecture adaptations in team sports players? A meta-analysis

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Abstract: BACKGROUND:Managing resistance training variables is crucial to optimize and achieve the desired adaptations (1), especially in muscle architecture adaptations, which is a good predictor of muscle's force-generating capacity (2). The aim of the present meta-analysis was to analyze the differences between performing resistance training until muscle failure and performing with submaximal efforts on muscle architecture adaptations in team sports players. METHODS: Five databases were used for search up to 9 may 2023. Studies that analyzed quadriceps architectural adaptations in team sports players were included. Resistance training groups were classified into maximal efforts (i.e., until muscle failure) and submaximal efforts (i.e., not reaching muscle failure). Tests for subgroups differences (i.e., maximal efforts vs submaximal efforts) were performed. Significance was set at $p < 0.05$. RESULTS: 12 studies (261 players) were analyzed. On vastus lateralis: muscle thickness, resistance training with maximal efforts (SMD = 0.46) and with submaximal efforts (SMD = 0.41) showed significant increases. On vastus lateralis fascicle length, maximal efforts showed a non-significant decrease (SMD = -0.09), whereas submaximal efforts showed a non-significant increase (SMD = 0.32). On vastus lateralis pennation angle, maximal efforts (SMD = 0.18) showed a non-significant increase, whereas submaximal efforts showed significant increases (SMD = 0.42). Rectus femoris muscle thickness showed significant increases both in maximal efforts (SMD = 0.54) and submaximal efforts (SMD = 0.79) groups. Non-significant differences between groups were found in all measured outcomes. Rectus femoris fascicle length and pennation angle, vastus intermedius and vastus medialis muscle architecture were not analyzed due to lack of data. CONCLUSION: Resistance training until muscle failure showed similar adaptations on quadriceps muscle architecture than performing non-failure training, with greater SMD for submaximal group in all measured outcomes. Consequently, it is no necessary to reach muscle failure in team sports players to maximize architectural adaptations.

Keywords: muscle thickness; fascicle length; pennation angle; injury prevention; degree of effort

Machine Learning Analysis of the Relationship between Physical Activity and Bone Mineral Density in U.S. Women

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Abstract: INTRODUCTION: Osteoporosis is a condition that results in fragile bones and an increased risk of fractures. Exercise is an important part of preventing this condition. The National Health and Nutrition Examination Survey (NHANES) is a database that includes objective measures of physical activity and sedentary time for the US population. Machine learning algorithms can be used to explore relationships within this database, potentially leading to new and useful information. The aim of this study was to investigate the relationship between objectively measured physical activity and bone mineral density, as well as the variables that affect this relationship. METHODS: The study compared femoral neck bone mineral density (BMD) among different ethnic groups using the Kruskal-Wallis test. Post hoc comparisons were carried out using Wilcoxon's test with Bonferroni adjustment. Regression models were then developed to explore the association between the dependent variable (femoral neck BMD) and independent variables (age, body mass, grip strength, and vigorous-intensity physical activity time). Two different regression models were developed: multiple linear regression and random forest regression with Shapley Additive exPlanations (SHAP). RESULTS: The analysis included 1066 participants. Body mass had a positive effect on femoral neck BMD, while age had a negative effect. Grip strength had a greater impact on the model than vigorous exercise. The R-squared parameter, which measures the goodness of the fit, was 48%, indicating that about half of the variability in femoral neck BMD can be explained by age, body mass, grip strength, and vigorous-intensity physical activity time. CONCLUSION: The study's findings could help provide personalized physical activity recommendations for individuals based on their age, body mass, and ethnicity. The results suggest that improving body strength may be more beneficial for bone health than increasing vigorous-intensity physical activity time.

Keywords: bone, osteoporosis, exercise, regression, machine learning.

More Accessible Methods for Heel Height Measurement DROP JUMP

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Abstract: The vertical jump (VJ) Drop Jump (DJ) is widely used by researchers, coaches and physical trainers for its simplicity and wealth of information. However, methods used to measure the height of the jump considered the gold standard, such as the force platform, are difficult to access due to the price and accessibility using it in the field. The My Jump 2® App (MJ) and Kinovea® Software (SK) are low-cost, affordable devices for use in the field. The present study aims to bring more accessible and valid methods for measuring the height of the DJ. The survey consisted of professional track and field athletes (N=17, 7 women and 10 men, age 21.8 ± 2.6 years, body mass= 67.1 ± 10.4kg, height= 173.8 ± 8.6cm). At the first moment of data collection, anthropometric measurements, height and muscle mass were taken, then they were directed to the warm-up (10' running and 3 DP jumps for familiarization), after the warm-up, the volunteers performed 3 DJ jumps with 30" between them, the jumps were performed on the Contact Mat (TC) and simultaneously recorded in the frontal plane by an iphone 8 where the height of the jump was measured in the MJ® app and in the lateral plane by a samsung smartphone for time analysis of flight in Sk®, and later quantify the height of the jump by a mathematical formula ($h= t^2 \times 1.22625$) (BALSALOBRE-FERNANDES et. al. 2014). For data analysis, the interclass correlation coefficient (ICC) and Person's correlation (r) were used to test the correlation of the methods with the TC. All data showed normal distributions ($p>0.05$). Comparing TC and MJ® ($r=0.994$; ICC=0.994; CI=0.912-0.998; $p<0.001$), TC with SK® ($r=0.976$; ICC=0.988; CI=0.966-0.995; $p<0.001$) . With the results presented, we conclude that MJ® and SK® are reliable and accessible methods for measuring DJ height.

Keywords: Vertical Jump; Drop Jump: My Jump 2; Software Kinovea; Jump Height;

Acute effect of beet juice supplementation on the cardiovascular and hemodynamic response to eccentrically enhaced resistance exercise: a randomized, crossover, triple-blind, placebo-controlled trial

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Abstract: Supposedly, beet juice supplementation could increase the bioavailability of nitric oxide, benefiting the regulation of functional and physiological indicators related to sports performance owing to its vasodilator and hypotensive action. However, its effects on the modulation of the cardiovascular system in resistance exercises still are not clarified. The objective of this research was to evaluate the effects of acute supplementation of beet juice on the cardiovascular and hemodynamic response to eccentrically reinforced resistance exercise. (ERRE). This is a randomized crossover, triple-blind, placebo-controlled trial that was developed with 15 men (age 22±3.64 years old). After randomization, participants in the experimental condition received beet juice containing 400mg of standardized nitrate and were compared to the placebo condition (commercial grape juice), being submitted to an ERRE protocol, which consisted of 4 series of 12 repetitions with intensity of 100% of the maximum concentric strength and maximum execution speed in the concentric phase, with movement braking in the eccentric phase, interval between series of 90", in the leg extension exercise. Immediately at the end of each series, in the both conditions, heart rate (HR), blood pressure (BP), oxygen saturation (SaO2), subjective perception of exertion (PSE) and time under tension (TST) were evaluated. A smaller increase in systolic BP ($F=13.8$; $p=0.002$; $\eta2=0.5$) and diastolic BP was found in the last series ($F=3.58$; $p=0.042$; $\eta2=0.57$) in favor of the supplement. But, there was no difference between groups for HR ($F=1.17$; $p=0.205$; $\eta2=0.11$), SaO2 ($F=1.33$; $p=0.277$; $\eta2=0.15$), PSE ($F=0.63$; $p=0.443$; $\eta2=0.05$) and TST ($F=0.1$; $p=0.980$; $\eta2=0.05$). It is concluded that acute beet juice supplementation induced hemodynamic improvement and decrease in peripheral vascular resistance in response to ERRE, observed by the lower increase in systolic BP and reduction in diastolic BP in the last series, when compared to the placebo condition.

Keywords: Beet juice; Nitrate; Strength training; Cardiovascular response; Hemodynamics.

Prevention of shoulder injuries in hitting or throwing sports: Systematic review.

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Abstract: Introduction: Regarding the injury rate in racket and throwing sports (for example: baseball, tennis, basketball, handball or paddle tennis), prevention plays a very important role, since players are subjected to demanding, repetitive movements and with ranges. ends at the shoulder joint. Some risk factors, in throwing or hitting movements, above the head, (overhead), of the different sports modalities, may be the basis of recommendations for injury prevention, such as glenohumeral internal rotation deficit , external rotator cuff strength, and scapular dyskinesia. **Objective:** Analyze the risk factors and tools aimed at preventing injuries associated with overhead sports. **Methodology:** The Prisma method was followed to carry out the review and it was evaluated with the RoB and PEDro scales. A search was carried out in the Pubmed, Cochrane, Dialnet and ScienceDirect databases, in Spanish and English. The selection of articles was carried out with the keywords and the Boolean operators "AND", "OR". **Results:** The total number of articles found was 102, of which 8 were selected according to the inclusion and exclusion criteria. Most of them show similar risk factors in the different overhead sports and also, to a large extent, the prevention program is favourable. **Conclusion:** Regarding the prevention of injuries, it should be taken into account that each sport has its own biomechanical demands and, therefore, it would be advisable to analyze the possible risk factors and carry out each prevention program individually, taking into account the different criteria. to avoid future injuries and return to competition in good physical condition.

Keywords: “Risk factors”, “Injuries”, “Prevention”, “Overhead Sports”, “Hom”.

Influence of maturational status on the loss of sprint performance with load

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Abstract: Introduction: The biological maturation process can vary between individuals during the puberty stage, and especially during the adolescent growth spurt. This inter-individual variability in biological maturation could influence sports performance, talent identification or training processes in young soccer players. Sprints or accelerations are present during decisive actions in soccer matches in young players, so their optimization through different training methodologies could be key. **Objective:** Quantify the influence of maturational status on the loss of performance in the acceleration phase (0 to 5 m), sprint (0 to 30 m) and maximum speed (20 to 30 m) of the sprint, derived from the inclusion of different loads (25% and 50% of body weight) in young soccer players. **Methodology:** A total of 56 players participated in the study who were assigned a maturational state (pre-, mid-, and post-peak high velocity [PHV]) according to their somatic age, through the equation proposed by Mirwald (pre = 23, mid = 17 and post = 16). Each subject performed 3 sprints (unloaded, 25% and 50% load of body weight), the time was measured with the MySprint application. **Results:** Higher yield losses were found in the acceleration phase in the pre- and mid-PHV stages than in the mid- and post-PHV stages. However, the differences in the loss of sprint and maximal speed performance are greater between the mid- and post-PHV groups than in the pre- and mid-PHV groups. These findings could contribute to improve training processes in adolescents by taking advantage of the windows of opportunity and adapting the correct stimuli to the subject's maturational state.

Keywords: adolescence, maturation, resisted sprinting, strength, maximum speed

Efectos del foco de atención y del entrenamiento sobre la carga mental y el aprendizaje de la arrancada.

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Abstract: This study aimed to compare the effectiveness of two different focus of attention strategies and two different training schedules in learning the pull-up technique in adults (20-22 years old), to observe differences in learning and mental workload. Six participants, with no weightlifting training experience but with strength training experience, were divided into three groups: control group with training based on traditional weightlifting training with an internal focus of attention, external focus group and internal focus group, both with training based on the characteristics of weightlifters. Although it has been investigated how attentional foci play an important role in an Olympic movement and the characteristics important in weightlifters have been extensively researched, both have not been taken into account for an intervention. The MRI was used to measure the maximum weight they could lift in the snatch technique before and after eight training sessions, and the NASA TLX questionnaire was used to measure mental workload throughout the intervention, including the pre-intervention and post-intervention benchmarks. After the eight training sessions, the control group showed greater percentage improvements in the pull-off compared to the external focus group and the internal focus group, while mental workload levels were lower in those groups using an internal focus. The present results indicate that the use of an internal focus and training based on traditional training was superior for the improvement of pulling technique, and that an internal focus produces less mental workload than an external focus.

Keywords: weightlifting" "attentional focus" "cognitive load" "snatch" "strength training"

Creatine Supplementation on Jump Performance

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Abstract: Supplementation is a widely discussed topic in the training industry, but is it really necessary? One of the most commonly used and accepted compounds for supplementation is creatine, which has been shown in several studies to increase muscle mass and exercise capacity in short duration and high-intensity workouts. Additionally, creatine supplementation has been proven to aid in post-workout recovery and injury prevention. Creatine is involved in energy functions within the anaerobic alactic pathway, and is an important factor in the production of energy for short duration activities. Creatine is catalyzed by Creatine Kinase, an enzyme that transfers a phosphate group from creatine to ADP, generating ATP for cellular energy production. This study aims to examine and evaluate the supplementation of creatine and its effects on the performance of jump athletes. It can be taken in doses of 3-5 g/day or 0.1 g/kg body weight/day by individuals who exercise regularly and have a healthy diet and lifestyle. According to studies, jumping falls under the category of Fast Strength. It would be expected that creatine would have a significant influence on jump training, due to it being a short duration and high-intensity workout. However, while fast strength is influenced in various ways by creatine supplementation, the changes are not very significant, leading to the conclusion that creatine supplementation for specific jump training may not be as profitable as expected, compared to, for example, muscle hypertrophy training, which is also a short duration and high-intensity workout.

Keywords: Creatine; Performance; Supplementation; Jump; Meta-Analysis

The importance of hydration in sports performance

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Abstract: In the most varied sports, the result of the combination of several factors, such as training, nutrition and rest, results in performance. For a better performance, it is not enough to have only quality nutritional levels, but also good hydration throughout the day, and especially for those who practice a modality, as they must take into account the water expenditure in training or in the competition. Hydration is not only essential for better performance but also extremely important in the post-training or race recovery phase. For an athlete, hydration presents different variables to take into account, such as the type of activity, age, weight, height, training/test you did, etc. Therefore, our study focused on analyzing the importance of hydration in sports performance and observing its impact on sports performance. Hydration, fundamentally, is the replacement of water in the body so that water loss is simultaneously a means of transport and distribution of vitamins, minerals, glucose, oxygen and other nutrients

to the cells. Most of the water found in the organism is located in the cytoplasm and provides the performance of the metabolic functions of the organism. The benefits of hydration act in different aspects depending on the subject, acting with greater incidence on the brain and skin. The recommended doses of water intake are on average two liters per day, however it varies greatly depending on the age group: we found that young people (up to 17 years old) have to consume 40 ml per kg, while people aged 18 to 55 years old should consume 35 ml per kg, people aged between 55 and 65 years old should drink 30 ml per kg and, finally, individuals over 66 years old should drink about 25 ml per kg. each kg.

Keywords: Hydration, Exercise; Sports Performance.

Impact on carbohydrates-based feeding before the competition

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Abstract: When it comes to top competition, all factors and details count for success. Diet is no exception, and is considered almost as important as training. Through balanced and planned diet it is possible to achieve success. The objective of our study was to analyze the importance of carbohydrates before a competition. Based on studies we can see that the energy used by athletes is provided by glycogen stored in the muscles, derived from carbohydrates. Athletes must adapt their carbohydrate intake according to the training requirements. Before a competition the scenario becomes a little different, the athlete must ingest a marked amount of carbohydrates because he needs as much energy as possible to get the best possible result. For competitions of short duration (up to 1 hour) one should not eat large amounts of carbohydrates or else fast absorbing carbohydrates. It is estimated that the recommended amount for sports of medium duration is 30g to 60g of carbohydrates per athlete, whereas sports lasting more than 2h30m can benefit from the intake of carbohydrates up to 90g per athlete. Foods with different types of carbohydrates in their composition can maximize their absorption. According to the analysis performed it was possible to verify that carbohydrates have an extremely positive role in energetic aspects, which benefits the athlete's disposition for training/competition.

Keywords: Carbohydrates, High-Competition, Performance, Sports Diet.

Impact of protein supplementation before and after a training

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Abstract: Food supplementation consists of chemical substances that are produced especially to complement the diet. They can be composed of all vitamins and minerals and are therefore known as multivitamins, or they can contain only certain substances, as in the case of Creatine, which is indicated especially for those who practice some kind of physical activity. Protein is a substance formed from a set of linked amino acids. They are present in all cellular processes and perform various functions in the body. Protein supplements are often consumed by athletes and recreationally active adults to achieve greater gains in muscle mass and strength with the aim of improving their physical performance. Our objective was to verify the impact of the effects of protein supplementation on muscle mass and strength. In conducting this study, several searches for articles pertaining to our topic were conducted on the "PubMed" search engine. Results: Protein intake (2.2-3.0 g/kg/day) should be distributed throughout the day (3-6 meals), ensuring at each meal an adequate amount of protein (0.40-0.55 g/kg/meal) and including a meal within 2-3 h before and after training. Thus protein supplementation can significantly increase lean body mass, but cannot significantly increase muscle strength. Being that with the addition of exercise it creates a big impact not only on body mass but also on muscle strength. When it comes to post-workout there is limited and inconsistent data regarding the use of protein supplementation to enhance the recovery of muscle performance after physical activity. Conclusion: There are limited and inconsistent data showing that protein supplementation can improve performance recovery after team sports activity, despite an attenuation of indirect markers of muscle damage. Regarding pre-workout, we conclude that protein supplementation can increase muscle mass and performance when the training stimulus is appropriate (e.g., frequency, volume, duration) and dietary intake is consistent with recommendations for physically active individuals. In summary, physical training can significantly increase lean body mass and peak torque.

Keywords: Supplementation, Protein, Muscle mass, Muscle strength.

Impact of diet on an athlete's performance

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Abstract: Diet is very important for improving the sports performance of athletes. In recent years, this factor has become increasingly important throughout the sports season. In the competitions of various sports, following a diet allows achieving the best performance in decisive moments. Our objective was to understand if the application of various types of diets is beneficial or detrimental to the performance of high performance athletes. Methods: A PubMed database search was conducted in order to analyze the effectiveness of nutritional strategies in improving athlete performance and health. Results: As results we obtained that intermittent fasting and time-restricted diet produce health benefit; cytogenic diet shows no significant evidence; high carbohydrate diet leads to reduced cholesterol levels and increased triglyceride levels; intake of vegan and vegetarian diets tends to improve performance in endurance exercise; athletes with access to nutritionists are not likely to seek nutritional information via social media; lower education levels in athletes may influence dietary intake; the Paleolithic diet has no negative impact on athletes; the Low-Carb High-Fat diet affects athletes' subjective well-being; the Low-Carb Cytogenic diet shows no evidence of performance loss. In short, a diet that provides major changes in the athlete's former diet affects the athlete's performance. Thus, given the information we can advise the professional monitoring of a nutritionist in order to provide a better dietary intake allied to the requirements of each modality. At the nutritional level, the presence of carbohydrates and the exclusion of diets with high fat content shows evidence of improvement in the performance of athletes, if the intake of other energy sources found in vegan and vegan diets is not disregarded.

Keywords: Diet, Athletes, Nutricion, Performance.

The importance of hydration and electrolyte intake in endurance sports

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Abstract: The influence of nutrition and exercise on the health and quality of life of individuals has never been more important than it is today. The quality and quantity of food ingested has positive or negative effects on both the health and the sports performance of an athlete. An athlete practicing an endurance sport needs to be careful not only about the food he or she eats during a race/training session, but also about his or her hydration. The objective of this article was to analyze the importance of hydration and the consumption of electrolytes in endurance races/training and its effects on the athletes' bodies. The intake of food or water and electrolytes depends on the temperature; the degree of difficulty, intensity, and duration of the test/workout; and the physical condition of the athlete. Hydration aims to replace water and electrolyte losses, because being well hydrated is an important factor for good sports performance. Reduced water intake has negative effects on the oxygen transport capacity to the muscles since it reduces the blood circulation volume. On the other hand, excessive water intake will also have negative effects. Thus, for an athlete to stay hydrated during a race, he should drink between 1 and 1.5 liters per hour. In a phase of significant dehydration, depending on the individual's body mass, the percentage of body mass change ranges from - 3% to -5%. Electrolytes transmit nerve impulses through the body via electrical discharges, and also help transport nutrients to the cells. For races/training of less than 60 minutes, drinking only water is sufficient. However, for workouts longer than 60 minutes, you should not only drink water, but also carbohydrates (to provide quick energy), and electrolytes (to increase the transport of nutrients into the cells). We conclude that the goal of hydration is to avoid excessive dehydration, not allowing a loss of more than 2% of body mass by water deficit, as well as to avoid large fluctuations in the electrolyte balance, so that sports performance is not compromised.

Keywords: Nutrition, Hydration, Electrolytes, Performance, Endurance

The Vegetarian Diet in an Athlete

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Abstract: The practice of a healthy diet presupposes that it should be complete, varied and balanced. There are more and more athletes at the top of sports with a vegetarian diet, however, many still argue that this regime is insufficient. Thus, the objective of this study was to analyze the impact of a vegetarian diet on the performance of an athlete. Methods: A database search was performed using pre- defined keywords in several search engines such as Pubmed, Web of Science and B-On to find relevant articles for the study. Nineteen articles were selected that were about 10 years old. Results: The vegetarian athlete has at the performance level the same abilities as those who are not vegetarian. Vegetarian diets can decrease the risk of chronic, degenerative and inflammatory diseases and weight control. Regarding the distribution of Macronutrients in % of total energy value, in adults it is recommended: Fat 20% - 35%; Omega-3 fatty acids 0.6% - 1.2%; Omega-6 fatty acids 5% - 10%; Carbohydrates 45% - 65%; Protein 10% - 35%. Conclusions: After the analysis of the articles, it is understood that there is no difference in the athlete's performance between omnivores and vegetarians. However, the possibility of nutritional supplementation should be considered only if the nutritional needs are not met through food.

Keywords: Vegetarian Diet; Sports; Nutrition; Athlete; Performance; Health.

Impact of type of nutrition on strength training

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Abstract: Nutrition plays a key role in strength training by providing the body with the necessary nutrients for recovery, muscle growth, and injury prevention. In addition, proper nutrition is essential to increase and maintain energy during training, maximizing performance and results obtained. The purpose of our study was to understand how different types of foods and nutrients affect performance, muscle recovery, and muscle mass gain in high performance athletes and average people who perform strength exercises. Methods: The research conducted led to the collection of 8 articles through the pubmed platform, in which the main results obtained focused on recommendations about the right amount and timing of protein, carbohydrate, hydration and supplementation intake in order to maximize the effects that strength training exerts on the body. Results: According to the different studies and articles reviewed, for individuals who practice strength the recommendations for daily protein intake comprise values between 1.2 and 2.2 grams of protein per kg of body weight. The general recommendation for carbohydrate intake is 3 and 5 grams per kg of body weight per day, especially before and after training. Regarding hydration, the results of the recommended amount of water are 3 to 4 liters per day, depending on the level of physical activity and the weather. Conclusions: We can conclude that protein, carbohydrate, hydration, and supplementation intake are crucial for strength training because they help provide energy for exercise, improve recovery, and promote increased muscle mass.

Keywords: nutrition; strength training; performance; protein; carbohydrates;

The importance of diet in the recovery of an athlete

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Abstract: Diet plays an important role in sport by ensuring a supply of essential nutrients for preparation, recovery, adaptation and optimization, in order to enhance results and sport performance. In an athlete's recovery it is essential to replenish the reserves that the body has spent, such as minerals and liquids lost during training. Protein also plays an important role because it will help in muscle regeneration and recovery. The objective of this study was to analyze the role played by diet in the recovery of athletes after exercise. Methods: Using the defined keywords, we searched online repositories for articles that met the objective of our work. We selected 8 articles from different engines (Google Scholar and Pubmed). Results: It is recommended to ingest 0.3g/kg of protein as soon as possible after training. Regarding carbohydrates the recommended amount is 1-1.2g/kg in the first hour after exercise or 5-7g/kg throughout the day. In fluids 1.0-1.5L for every kg of body mass lost. As for creatine the values are 3- 5g/day over a 30 day period to increase muscle creatine. Conclusions: Diet plays a key role in post exercise recovery. The adequate and correct intake of the different nutrients enhances a faster and more effective recovery. In this sense, the knowledge about recovery and the various nutritional strategies used in order to accelerate the recovery process becomes essential, not only for athletes, but also for the sports staff that involves them.

Keywords: Diet, Athlete, Recovery, Sprint, Macronutrients, Performance

Placebo Effect vs caffeine in sports performance

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Abstract: 1,3,7-trimethylxanthine, popularly known as caffeine, is a competitive antagonist of adenosine receptors. This substance is widely consumed around the world and can be found in different sources in nature, the coffee bean being the best known of them. Caffeine can exert different effects on the human body, such as reducing oxidative stress and fatigue and, mainly, having an ergogenic effect. These effects have widespread public knowledge and a strong scientific basis, making caffeine one of the most consumed supplements on the market for acute benefit. However, such dissemination may create in the general public the idea that the use of caffeine does not require protocols, and therefore, they end up enjoying only a certain placebo effect when making indiscriminate use of caffeine. The objective of this narrative review was to clarify some physiological limitations and psychological potentialities of caffeine. To construct this paper, 10 articles ranging from clinical trials to reviews were analyzed, which together resulted in the observation of 3517 individuals and at least 425 articles. As expected, the great majority of the articles proved the efficacy of caffeine as an ergogenic substance, but we also found information proving its similarity with inert substances. In conclusion, caffeine is a substance with ergogenic effects that improve physical performance in aerobic and anaerobic exercise. The recommended dosage varies between 3 and 6 mg/kg of body mass, with minimum effective doses not yet established. Supplementation should be done about 60 minutes before exercise. Placebos may offer therapeutic benefits for a variety of clinical and sporting conditions, including athlete performance. Caffeinated sports drinks are effective in endurance, strength, individual and team-based sports. The ergogenic effect of caffeine is associated with blocking adenosine receptors and increasing motor unit recruitment, improving exercise performance. The recommended dosage is usually limited to 3 mg/kg to avoid negative side effects.

Keywords: Placebo; Caffeine; Performance; Supplementation.

Importance of Nutrition in Combat Sports

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Abstract: In Olympic combat sports, athletes are divided into weight categories in an attempt to reduce discrepancies between athletes. Thus, over time combat sports and nutrition have become increasingly linked in order to create a more efficient weight/strength ratio. Athletes generally compete at lower weight divisions than their normal everyday weight, thus making chronic and acute manipulations of body mass, where their strategic use can improve their competitive success. Thus, the aim of the study was to analyze the strategy used by athletes to gain and lose weight efficiently and how we can prevent injuries due to drastic weight loss with a balanced diet. Through the articles analyzed in the Pubmed platform, we can understand that the key factor to gain and lose body mass in these sports is the water ingested and the intake of carbohydrates, and athletes only recover an average of 1.9kg of body weight during recovery. During recovery we observed that water represented 86% of the total intake, with ¼ of the water consumed coming from carbohydrate-rich drinks, and carbohydrates represented 5.5g/kg of body weight, and the recommended intake would be 8-10g/kg of body weight. However the discrepancy between nutrient intake and weight gain points to physiological barriers of fluid retention. Athletes are still able to use strategies around glycogen and electrolyte replacement to prepare for competition. In short, for weight loss they range from reduced glycogen availability, to increased perception of fatigue, they restrict energy intake, reduce total body fluids, increase exercise, heat exposure, and psudo-extreme/abusive medical practice (diuretics), thus reducing body mass. For weight gain and strength recovery, carbohydrate and protein consumption combined with scientifically proven supplementation (i.e. green tea, beets, creatine, or alkaline water) and other methods such as physical (cold water immersion, massage, etc.) and physiological (active recovery, sleep and rest) therapies. For injury prevention and recovery it is based on the intake of amino acids and proteins, antioxidants, creatine and omega 3, due to their therapeutic roles in preventing muscle loss and anabolic resistance, as well as in injury healing.

Keywords: nutrition, combat sports, nutrition, weight loss, injury prevention, recovery, weight gain.

Effects of sucrose and fructose on metabolic syndrome and its relationship with the practice of physical exercise

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Abstract: Nutrition is one of the fundamental principles for physical exercise, being the science that studies the relationships between the foods and nutrients ingested by humans, facilitating the assessment of health and disease status. For better sports performance, attention must be paid to the foods consumed, which vary in different sports activities. This study aims to analyze already collected data and conduct a review of various articles that focus on the ingestion of sucrose and fructose and their effects, studying the impact and effects of the combined ingestion of fructose and sucrose with glucose and the respective rates of exogenous carbohydrate oxidation, evaluate epidemiological, pathophysiological, and clinical evidence on the association between fructose consumption and the addition of NAFLD (Non-Alcoholic Fatty Liver Disease) and type 2 diabetes, and finally, its influence on physical exercise, evaluating the positive and/or negative impacts of its consumption on population health. The studies showed that isolated fructose consumption causes intestinal discomfort in athletes; despite the increase in exogenous oxidation to values above 1.2g/min up to 1.7g/min after the consumption of glucose with fructose/sucrose, it does not accelerate the replenishment of muscle glycogen, however, it accelerates the rates of glycogen repletion in the liver (<1.2g/kg/h), mainly in post-physical exercise recovery; the emergence of various diseases such as type 2 diabetes, kidney stones, and NAFLD may be related to high fructose intake in the diet; the co-ingestion of glucose and sucrose/fructose can decrease intestinal discomfort and increase the capacity for exogenous carbohydrate oxidation. In other words, it is necessary to balance carbohydrate intake and avoid excessive fructose consumption, especially in athletes. In the near future, more studies will be necessary on sucrose with a focus on athlete recovery."

Key-words: “glucose”, “fructose”, “sucrose”, “performance”, “athletes”

Impact of Pré-Competition Stress on Eating Behavior

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Abstract: Sports performance results from the impact of training, nutrition, and rest that the athlete is subjected to on a daily basis. Nutritional habits affect recovery between workouts and influence the effects of the training. What also affects nutritional habits and consequently poor recovery is stress, if we are stressed we will have a worse quality of sleep, we will have a less balanced diet, such as overeating or foods with high sugar and fat content, or the opposite, which is not eating and this leads to having no energy. Stress can influence decision making in humans from many cognitive perspectives, while the underlying neurobiological mechanism remains poorly understood. The goal of our study was to analyze the influence that stress can have on athletes' eating behavior before competition. As mentioned before, a good diet is fundamental for the athlete's performance, and sometimes stress will cause a change in eating habits, which will be detrimental to performance. In one of these studies, rats were placed in a plastic container for two hours before behavioral tests. The stressed rats showed some behaviors such as anxiety, and elevation of serum costicosterone (CORT) and epinephrine (EPI), then they were placed in an open field standard food and sweet food and it was found that the rats preferred the sweet foods. In another study it is argued that training in a competitive environment and prolonged exertion may be associated with numerous hormonal and biochemical changes, which have detrimental effects on immune function. This study shows that poor nutrition caused by stress will affect the athlete's performance due to hormonal changes, which will ultimately be detrimental to the race due to the heavy strain of immunocompetence.In summary, we can conclude that stress changes our eating behavior as well as our daily habits.

Key Words: Stress, Food, Pre-Competition, Performance.

The effect of acute high-dose supplementation of beta alanine performance of corridors amateurs

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Abstract: Beta alanine has been identified as an ergogenic capable of optimizing sports performance, especially in individuals who perform high-intensity activities such as running, due to its buffering capacity, but it is still not known for sure in relation to acute supplementation and with a high dosage. The aim of the study was to analyze whether acute high-dose supplementation of beta alanine improves the performance of amateur runners and their responses related to their symptoms.The research was composed of 14 individuals (ages 24.8 ± 3.8 years; height of 171.1 ± 5.9 cm; %F 6.8 ± 4.1)with at least 2 years of practice in the municipality of Lavras-MG. First, they were divided into PLA or BA groups and became familiar with the procedures to be adopted., on the second and third day, the participants arrived 1hr before the main test, due to the ingestion of 30mg·kg-1 of supplement or placebo, writing down the level of paresthesia every 10 min, after 1hr they were submitted to theUniversity of Montreal Track Test **(**UMTT). Collecting: total distance covered, heart rateevery 2 min. Descriptive statistics were used, T test for two non-dependent samples for equality of means, with $p<0.05$ significance, in SPSS® software version 25.0. When analyzing the results obtained, it did not report any significant difference. But it is possible to notice an increment of 40m in the distance covered after ingestion with BA (BA: 4151.43m ± 655.99m; PL: 4111.43m ± 784.02m), for fc there is a decrease when the individuals were supplemented BA,(BA: 188.36 ± 13.71; PL:193.57 ± 11.50), already in regarding side effects, 4 out of 14 reported symptoms of paresthesia.

Key words: Beta Alanine, Paresthesia, Supplementation, Runners, Performance

Healthy Behavior and Sports Drinks: A Systematic Review

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Abstract: This review article aims to systematically identify the relationship between sports drinks and healthy behavior. The systematic literature review was conducted according to the criteria of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and eligibility criteria were stated through the PICOS (population, interventions, comparators, outcomes, and study) tool based on about 1,000 records of sports drinks papers identified from the various Web of Science Core Collection databases. The literature review stages determined a narrow article set that related these sports drinkable supplements to healthy behavior. But these studies are largely related to sports drinks with nutritional and oral/dental health, and there is a large number of studies that establish a relationship between this sport drink supplements and sports activity, highlighting that the consumption of sports drinks is associated with increased moderate to vigorous physical activity, but it is necessary to strengthen the recommendations for consumption after prolonged vigorous activity and maintain proper oral health, in an attempt to discourage unhealthy behaviors.

Keywords: Sports drinks; Food supplement; Healthy behavior; Oral behavior; Dental behavior; Eating behavior; Child; Adolescence.

ANTHROPOMETRIC DETERMINATION OF THE SOMATOTYPE, FAT PROFILE AND BASAL ENERGY EXPENDITURE OF PROFESSIONAL CROSSFIT ATHLETES

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Abstract: CrossFit is a conditioning and training program that has been gaining recognition and interest among the physically active population. It is based on a complex set of exercises and includes running, weight lifting, gymnastics, and ballistic movements. At the competitive level, 3 categories are distinguished: climbing, intermediate and Rx, the latter being where professional athletes compete. The objectives of the study were to establish the reference somatotype of the professional CrossFit athlete, together with fat mass values and to assess the basal energy expenditure by gas analysis of professional CrossFit athletes. In the present study, 13 professional athletes participated, 7 women and 6 men. Anthropometric measurements were collected following the protocol of the "International Society for the Advancement of Kinanthropometry" (ISAK). Fat mass (FM) was calculated using the Withers equation. The somatotype components were estimated using the Carter and Heath equation. Basal metabolism was measured by indirect calorimetry with FitMate Pro (Cosmed). The athletes presented a somatotype in which mesomorphy (5.90±1.68) predominated compared to endomorphy (1.81±0.58) and ectomorphy (1.45±0.39), the same as the athletes present a somatotype in which mesomorphy (4.79 ± 0.86) predominated compared to endomorphy (2.03 ± 0.68), and ectomorphy (1.89 ± 0.94). It was also observed that women had a fat profile (9.0±2.1%) similar to men (8.2±2.2%). In men, the average height corresponds to 177.0 ± 7.1 cm, and an average weight of 84.2 ± 2.8 kg; while in women the average height corresponds to 163.7 ± 6.2 cm and the weight to 61.6 ± 5.5 kg. Resting basal metabolism values were higher in men (2704±412 kcal/day) than in women (2082±401 kcal/day).

Keywords: CrossFit, anthropometry, somatotype, fat mass, body composition.

Kineanthropometric values and somatotype in competitive climbers

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Abstract: Climbing is a growing sport that is expanding rapidly all over the world, with more and more climbers taking up the sport and participating in competitions at different territorial levels. Therefore, a special interest arises in knowing which anthropometric values determine performance in competition. The total sample consisted of 18 athletes competing at regional level, of whom 11 were male (22.5±2.2 years) and 8 female (21.8±1.6 years). Anthropometric measurements were taken following the ISAK guidelines in order to compare the values with the results obtained in the interuniversity competition, which included 20 blocks of varying difficulty and 3 hours of time to perform all the necessary attempts. In the women's group, it was observed that the greater the sum of 6 folds, mean value of 66.3±12.2 mm, the worse the final positions ($p<0.05$), which could be a determining factor in the performance of the athletes. In addition, weight (54.5±4.6 kg), wingspan (165.6±5.4 cm) and height (163.7±4.2 cm) values were taken, showing that the climbers with the greatest relative wingspan were those who obtained the best results in the tests. There was no significant relationship between adipose-muscular index (AMI) (0.8±0.1) and performance. The mean 6-fold sum in males was 57.0±16.3 mm, and no relationship was found with performance in the competition. Weight values were 72.2±9.1 kg, wingspan 181.8±10.1 cm and height 177.4±7.1 cm. As in the women's group, better results were obtained the greater the relative wingspan. The AMI was 0.5±0.1, which is considered a very good value, but not significantly related to test performance. As for somatotype, both the male and female groups showed a balanced mesomorphic profile (2.3-4.5-2.7 and 2.6-3.7-3.1 respectively).

Keywords: Climbing; competition; somatotype; anthropometry; wingspan

Effects of physical exercise and diet on maximum fat oxidation capacity in Type 2 Diabetes Mellitus patients.

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Abstract: Maximum fat oxidation capacity (MFO) during exercise and its relative intensity respect of VO_2max (FatMax) are markers of metabolic flexibility. An impaired metabolic flexibility is characteristic of metabolic diseases as Type 2 Diabetes Mellitus (T2DM). This study aims to determine the effects of exercise and diet on MFO and FatMax in T2DM patients. A randomized clinical trial was conducted on 99 T2DM patients with two types of physical exercise (moderate-intensity continuous training (MICT) or high-intensity interval training (HIIT)) isolated or combined with diet. A total of 6 groups were included: MICT, MICT+Diet, HIIT, HIIT+Diet, Inactive (Inac) or controls, and Inac+Diet. The supervised physical exercise sessions were conducted 3 times per week on cycloergometer. MICT consisted in 50 min at 10% over lactate threshold intensity, while HIIT consisted in 10 bouts of 1 min over 90% of peak power with 1 min of rest. Diet was balanced in macro and micronutrient with a caloric deficit of 350-500 kcal with personal interviews. MFO and FatMax were assessed by indirect calorimetry before and after the 12-week intervention with a gradual test with 15W increments every 3 minutes until RER achieved 1. A significant *time* x *diet* x *training* interaction was found for MFO ($p=0.05$). A main effect of time was found for FatMax ($p=0.01$). Bonferroni post-hoc comparisons showed a MFO augment only in MICT while FatMax improved in MICT and HIIT conditions ($p<0.05$). Neither diet condition nor controls showed statistically significant changes. Therefore, exercise can improve FatMax in T2DM patients independently of diet and modality of exercise. However, working at intensities near to MFO (~LT) improves this capacity but this not occurred with HIIT. Thus, HIIT and MICT can improve metabolic flexibility in T2DM patient but only MICT improves MFO during exercise.

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Keywords: maximal oxidation capacity, FatMass, Type 2 Diabetes Mellitus, exercise, diet

Effect of Supplementation with Different Doses of Caffeine on Glucose Concentration After Resistance Exercise

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Abstract: Caffeine supplementation can promote increased neuromuscular efficiency through modulation of physiological and metabolic responses. Among the metabolic alterations, the acute ingestion of caffeine seems to favor an increase in metabolic tension, due to the influence of glucose metabolism, providing an increase in its serum concentration (SHEARER; GRAHAM, 2014). These effects have already been observed in aerobic exercises, but little is known about their action in resistance training (RT). Thus, the objective was to evaluate the influence of different caffeine dosages on blood glucose concentration after performing a muscle endurance test. Eleven men (25.7 ± 5.9 years; 71.1 ± 11.0 kg; 170.72 ± 6.6 cm) were supplemented with low (CL = 210 mg) and high (CH = 420 mg) caffeine. or placebo low (PL = 230 mg) and high (PH = 460 mg) sixty minutes before testing. Anthropometric data and the 1RM test for the bench press (BP) exercise were collected at first. From the second collection, the glucose was evaluated pre and post-test of muscular resistance in the BP (80% RM) until the failure. The caffeine washout time was respected. A descriptive analysis of the data and a paired t-test with a significance level of $p < 0.05$ were performed. Glucose decreased significantly after the test at baseline times (96.00 ± 14.91 VS 84.09 ± 11.84 mg/dl; $p = 0.04$); PL (99.27 ± 18.68 VS 88.36 ± 11.60 mg/dl; $p = 0.04$) and PH (94.00 ± 13.02 VS 82.73 ± 14.58 mg/dl; $p = 0.01$), in the CH and CL conditions there was no significant difference after the test ($p > 0.05$). Thus, it was concluded that acute caffeine supplementation was able to promote an increase in metabolic tension, provided by a glycemic economy.

Keywords: Resistance Training. Caffeine. Glycemia. Neuromuscular. Metabolic Response.

Inorganic nitrate supplementation does not alter the second metabolic transition threshold point in amateur runners

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Abstract: We observed the behavior of the second metabolic transition threshold through the heart rate deflection point - PDFC, and its respective percentage in 13 male long-distance runners from a street running team in the city of Varginha - Minas Gerais submitted to a progressive exercise test (EPT) under acute Nitrate (NO3-) supplementation. We administered 70ml of concentrated beetroot juice rich in NO3- (~6.4mmol of NO3- - 400mg - Beet IT; James White Drinks Ltd, Ipswich, UK) - MN and placebo - MP depleted in NO3- (0.04 mmol of NO3- >0.8g/L - Beet IT; James White Drinks Ltd, Ipswich, UK) 2 hours before the tests based on the recommendations of the International Olympic Committee– CO. The TPE protocol was proposed by Heck et al., (1985) which consisted of a 5-minute warm-up at a constant speed of 4km/h without inclination. The test started immediately at the end of the warm-up at a speed of 8 km/h and increments of 1.0 km.h every 2 minutes, with a constant slope of 1%. As a result, we detected the heart rate deflection point - PDFC of MP and MN occurred respectively in 151.46 ± 6.09 Vs. 150.23 ± 6.23 with no statistical difference (p= 0.508; d=0.038). The %HRCMÁX in PDFC in MP and MN occurred respectively in 82.91 ± 3.75% Vs. 82.81 ± 3.80% (p=0.067; d= 0.01) without statistical differences. We conclude that nitrate was not able to modify the second metabolic transition threshold. However, we observed a slight tendency towards a decrease in cardiac effort in MN

Keywords: Beet; Ingestion; Metabolism; Capture

Load Control in Amateur Long-Distance Runners Under Acute Nitrate Supplementation in a Running Test

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Abstract: We observed the behavior of the Maximum Heart Rate – HRMAX, Subjective Perceived Effort – PSE and Maximum Oxygen Volume - VO2MAX parameters in 13 male long-distance runners from a street running team in the city of Varginha – Minas Gerais submitted to a progressive exercise test (EPT) under acute Nitrate (NO3-) supplementation. We administered 70ml of concentrated beet juice rich in NO3- (~6.4mmol of NO3- - 400mg - Beet IT; James White Drinks Ltd, Ipswich, UK) and placebo depleted in NO3- (0.04 mmol of NO3- >0 ,8g/L - Beet IT; James White Drinks Ltd, Ipswich, UK) 2 hours before the tests based on the recommendations of the International Olympic Committee– CO. The TPE protocol was proposed by Heck et al., (1985) which consisted of a 5-minute warm-up at a constant speed of 4km/h without inclination. The test started immediately at the end of the warm-up at a speed of 8 km/h and increments of 1.0 km.h every 2 minutes, with a constant slope of 1%. The equation was used to estimate the maximum volume of oxygen, namely; VO2MAX: (0.2*S) + (0.9*S*G) + 3.5 ml.kg.min-1. Heart rate was collected at the end of each stage. For the test to be considered maximum, the subject should reach at least 90% of the HRMAX predicted by the formula HRMAX= 208-(0.7 x age). During the progressive test, SPE was performed using the Borg protocol (2000) and the value was recorded every 2 minutes until the end of the test. We used comparison of means, standard deviation and analysis of sample effect size by Cohen test (d). We did not observe statistical differences in the HRMAX parameters (p=0.573; d=0.013); SPE (p=1.108; d=0.049) and VO2MAX (p=0.102; d=0.107). Given this, we conclude that nitrate does not interfere with load control parameters..

Palavras-Chave: Beet; Ingestion; Metabolism; Capture

Agreement and differences between fat estimation formulas using kinanthropometry in a physically active female population.

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Abstract: The importance of accurately estimating fat mass in various health- and sport-related fields has led to the development of numerous estimation methods and formulas (1). Considering that direct measurement of body composition is not feasible, the aim of this study was to compare the degree of agreement and differences in the results obtained by different formulas for estimating fat mass using anthropometry (2,3). Anthropometric assessments were performed on 54 physically active women following the International Society for the Advancement of Kinanthropometry (ISAK) protocol, including triceps, biceps, subscapular, iliac crest, supraspinal, thigh and leg skinfolds; Percent fat mass was calculated using 12 different formulas validated in the female population (Durnin-Womersley, Yuhasz, Faulkner, Carter, Peterson, Katch-McArdle, Sloan, Wilmore, Evans, Lean, Thorland, and Kerr) and the sum of 6 and 8 skinfolds. Subsequently, the differences between the results obtained with the different estimation formulas and the level of agreement between them were analysed. The results showed significant differences between the formulas (15.33±2.94% to 28.79±3.30%; $p<0.001$-0.004). The Carter and Yuhasz formulas showed moderate agreement with each other (CCC=0.974), while the other formulas showed low agreement (CCC<0.372). None of the formulas obtained similar results to Kerr's formula ($p>0.05$) (3). Therefore, the study concludes that the formulas used to estimate fat mass in anthropometry for the female population present significantly different results from each other and are not concordant, which means that the results obtained with different formulas cannot be compared. As a practical application, the use of the sum of skinfold could be an alternative for assessing the evolution of adipose tissue without the need for the application of formulas.

Keywords: adipose tissue; body fat; women; kinanthropometry; skinfolds.

Effects of foam roller on range of motion, flexibility, strength, and delayed onset muscle soreness in high performance athletes: A systematic review.

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Abstract : The Foam Roller (FR) is a self-induced myofascial release instrument to apply pressure directly on the skeletal musculature. We evaluated the impact of the FR on the musculoskeletal system in elite athletes, trying to identify the mechanisms that influence myofascial tissues. Following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines, we systematically reviewed studies indexed in the Web of Science, Cochrane, and PubMed. We included original studies published from 2018 to March 30, 2023, with controlled trials or pre-post-intervention designs. We used the PEDro scale to assess methodological quality. Among the 141 records identified in the search, a total of 10 studies met the inclusion and exclusion criteria. In general, the use of FR in high-performance athletes showed significant improvements on ROM and flexibility, and markedly beneficial effects on DOMS and strength, with no adverse effects on myofascial tissue. The use of FR appears to be safe, being an effective tool for the improvement of the physical qualities of mobility, strength, and flexibility, and to decrease DOMS, increasing sports performance due to its benefits on myofascial architecture, attenuating inflammation and pain.

Keywords: Foam roller. Myofascial induction. Flexibility. Range of Motion. Delayed Onset Muscle Soreness.

Effect of hip muscle strengthening exercises on pain and disability in patients with low back pain. A systematic review.

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Abstract: Low back pain (LBP) is a health problem that affects 70-80% of the population in Western countries. Because of the biomechanical relationship between the lumbar region and the hip, it is thought that strengthening the muscles of this joint could improve the symptoms of people with LBP. The objective of the study is to evaluate the current evidence on the efficacy of hip strengthening exercises to reduce pain and disability in people with LBP. Clinical trials were collected from PubMed, PEDro, and Scopus databases published up to September 2022. Based on Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines and using CASpe and PEDro tools for methodological quality assessment, we selected studies that included hip strengthening exercises as part of LBP treatment and measured pain and/or disability parameters. Among the 966 records identified in the search, a total of 7 studies met the established selection criteria. Overall, participants who performed hip strengthening exercises had significant improvements in pain and disability. The methodological quality of the included studies was assessed as "good". In conclusion, the addition of hip muscle strengthening exercises in the treatment of LBP is effective in improving pain and disability.

Keywords: Low back pain; hip; strengthening; disability; exercise

Ciclo menstrual e níveis de força em mulheres adultas: um estudo piloto

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Resumo: O ciclo menstrual (CM) induz variações nas concentrações séricas hormonais sexuais reguladas pelo eixo hipotálamo-hipófise-ovariano. Especula-se que as oscilações hormonais durante as diferentes fases do CM podem influenciar sistemas fisiológicos como o músculo esquelético, podendo impactar no desempenho físico e na qualidade de vida. Considerando que não há um consenso na literatura acerca dessa temática, o presente estudo objetivou verificar e comparar os efeitos do CM nos níveis de força de mulheres adultas jovens. A amostra foi composta por mulheres de 18 a 25 anos, que faziam uso (G1) ou não (G2) de contraceptivos orais (CO). Para as voluntárias que não utilizavam CO, a determinação das fases do CM foi estimada pela média do comprimento dos ciclos menstruais anteriores com uso de aplicativo de celular. Para todas as voluntárias foram planejadas coletas onde são visualizadas maiores oscilações hormonais, nos dias 01 (fase folicular precoce), 11 (fase folicular tardia) e 21 (fase lútea média). As concentrações hormonais foram determinadas por extração sanguínea. A força muscular foi avaliada pelos testes de contração voluntária isométrica máxima (CVIM) e de força dinâmica máxima (1RM). Os dados foram tratados por meio da ANCOVA de 2 fatores (grupo e tempo), com nível de significância de $p<0,05$. Para comparação intragrupo, o G1 apresentou redução significativa na CVIM durante a fase folicular tardia, enquanto o G2 não apresentou diferenças significativas. Para comparação intergrupos houve redução significativa da CVIM (fase folicular tardia) e da 1RM (fase lútea média) no G1 em relação ao G2. Assim, é possível considerar que, os resultados deste estudo piloto sugerem que o CM induz a redução nos níveis de força muscular durante a fase folicular tardia e fase lútea média em mulheres adultas jovens.

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Palavras-Chave: Ciclo Menstrual, Estrôgenio, Progesterona, Força Muscular, Potência Muscular.

O ciclo menstrual promove alterações nos níveis de flexibilidade? Uma análise preliminar

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Resumo: Durante o ciclo menstrual (CM), ocorrem variações nas concentrações séricas dos hormônios sexuais femininos que podem influenciar as estruturas e funções dos tecidos muscular e conjuntivo. Tratando-se da flexibilidade, algumas pesquisas mostraram que tais hormônios podem modular as propriedades estruturais e mecânicas de ligamentos. Logo, faz-se necessário compreender o comportamento da flexibilidade frente às alterações hormonais presentes no CM. Portanto, o presente estudo objetivou verificar e comparar os efeitos do CM na flexibilidade de mulheres adultas jovens. A amostra foi composta por mulheres de 18 a 25 anos, que faziam uso ou não de contraceptivos orais (CO). Para as voluntárias que não utilizavam CO, a determinação das fases do CM foi estimada pela média do comprimento dos ciclos menstruais anteriores com uso de aplicativo de celular. Para todas as voluntárias foram planejadas coletas onde são visualizadas maiores oscilações hormonais, nos dias 01 (fase folicular precoce), 11 (fase folicular tardia) e 21 (fase lútea média). A determinação das concentrações hormonais foi realizada por extração sanguínea. Para avaliação da flexibilidade, foi utilizado o banco de Wells. Os dados foram tratados por meio da ANCOVA de 2 fatores (grupo e tempo), com nível de significância de $p<0,05$. Na comparação intragrupo a flexibilidade apresentou redução na folicular tardia em comparação com a fase lútea média, no grupo que não fazia uso de CO. O grupo de que fazia uso de CO não apresentou nenhuma diferença significativa. Na comparação intergrupos não foi observada diferença sigificativa entre as duas condições analisadas. Assim, a partir de uma análise preliminar dos dados, é possível considerar que o CM parece induzir a reduções dos níveis de flexibilidade em mulheres adultas, durante a fase folicular tardia.

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Palavras-Chave: Flexibilidade; ciclo menstrual; hormônios femininos; estradiol; progesterona

EFEITOS DO TREINAMENTO FÍSICO NA CAPACIDADE FÍSICO-FUNCIONAL E QUALIDADE DE VIDA DE PACIENTES COM DOENÇAS CRÔNICAS NÃO TRANSMISSÍVEIS DE UM PROGRAMA INTERPROFISSIONAL

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INTRODUÇÃO: Doenças crônicas não transmissíveis (DCNTs), como diabetes mellitus (DM), hipertensão arterial (HAS) e obesidade (Ob), estão associadas à redução da capacidade física-funcional (CFF) e qualidade de vida (QV), aumentando significativamente o risco para morbidades e mortalidade prematura. Por outro lado, o treinamento físico (TF) tem papel coadjuvante como abordagem não farmacológica para prevenção e tratamento das DCNTs, bem como melhorar a CFF e a QV dos praticantes, sobretudo, quando realizado num cenário interprofissional. **OBJETIVOS:** Investigar os efeitos do TF na CFF e QV de pacientes com DCNTs acompanhados em um programa interprofissional de atendimento à saúde. **MÉTODO:** 86 pacientes sedentários foram acompanhados por 6 meses no programa de TF (exercícios resistidos; 2x/sem) com intensidade leve a moderada na escala de Borg adaptada. A CFF foi avaliada pelos testes: handgrip (HG), sentar e levantar em 30 segundos (TSL-30"), *timed up and go* (TUG), caminhada de seis minutos (TC6') e flexibilidade (FLEX). A QV foi avaliada pelo SF-36. Todas as avaliações foram realizadas no período incial (AV1) e após os 3 (AV2) e 6 meses (AV3) de acompanhamento. **RESULTADOS:** A idade média dos pacientes foi de 58,6 ± 12,7 anos e o IMC médio de 31,6±8,3. A prevalência de HAS foi de 81%, de DM de 48,7% e Ob de 55,0%. Após o acompanhamento evidenciou-se aumento do HG (27,4±9,4; 28,2±8,3; 30,5±4,6), no TSL-30" (10,3±2,6; 11,5±2,7; 12,7±2,3), no TUG (9,5±5,1; 8,8±4,3; 7,7±1,3), no FLEX (20,8±10,5; 22,6±10,6; 24,8±11,6) e no TC6' (401,5±77,3; 423,8±77,1; 445,7±74,8). Após o acompanhamento, a QV melhorou em todos os 8 domínios avaliados pelo SF-36. A adesão dos pacientes ao programa foi superior a 90%. **CONCLUSÃO:** O TF supervisionado realizado num programa interprofissional mostrou-se seguro e eficaz para aumento da CFF e QV de pacientes com DCNTs.

Palavras-chave: Diabetes Mellitus, Hipertensão Arterial, Obesidade, Exercício Físico, Educação Interprofissionalidade

Efeito de oito semanas de treinamento resistido reforçado excentricamente na função executiva de idosas: protocolo de estudo para um ensaio randomizado controlado

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Resumo: A função executiva é considerada uma habilidade cognitiva complexa, que permite ao individuo direcionar, inibir e alternar comportamentos e pensamentos para alcançar metas. A função executiva é afetada pelo envelhecimento e é a primeira a sofrer declínio, enquanto o envolvimento em exercício físico pode ser um aliado para amenizar os efeitos provenientes da diminuição da função executiva. Até o presente momento, este será a primeiro ensaio randomizado controlado a avaliar o efeito do treinamento resistido reforçado excentricamente (TRRE) sobre a função executiva. Para construção deste protocolo em ensaio clínico será considerado a declaração *Spirit 2013* e para garantir a completitude e reprodutibilidade utilizará o *Consensus on Exercise Reporting Template (CERT).* Esse ensaio contará com dois grupos de idosas sedentárias (n = 22), sendo um grupo de TRRE e um grupo de treinamento resistido convencional (TRC). A intervenção ocorrerá durante oito semanas, 2 vezes por semana (16 sessões). O grupo TRRE utilizará o dispositivo multi-gyn com volantes inerciais para execução do TRRE, realizando 4 séries de 8 repetições e deverá manter a máxima força concêntrica em todas as repetições. O grupo TRC executará exercícios em aparelhos de musculação convencional, realizando 4 séries de 8-12 repetições, mantendo a intensidade entre 6 e 10 na escala OMNI-RES. As intervenções ocorrerão no Departamento de Educação Física da Universidade Federal de Viçosa. O desfecho primário será a função executiva. Já os desfechos secundários serão o comportamento e qualidade do sono, qualidade de vida, manifestações de força, composição corporal e danos adversos. As idosas serão alocadas para os grupos TRRE ou TRC usando um software de número aleatório. O pesquisador principal será cegado, assim como o responsável pelas análises estatísticas. O mascaramento será realizado por um pesquisador externo a partir da técnica de envelopes opacos. O estudo será registrado como um ensaio clínico no clinicaltrial.gov.

Palavras-chaves: Envelhecimento, função executiva, funcionalidade, mulher, treino de força.
Agradecimentos: A pesquisa terá apoio com bolsas CAPES e FAPEMIG.

EJERCICIO FÍSICO Y TRASTORNO DEPRESIVO MAYOR EN ADULTOS: REVISIÓN SISTEMÁTICA Y METANÁLISIS.

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RESUMEN: Objetivo: El objetivo fue identificar los efectos beneficiosos y perjudiciales de diferentes modalidades de ejercicio físico en la sintomatología del trastorno depresivo mayor en adultos sin tratamiento habitual. Métodos: Se realizó una revisión sistemática y un metaanálisis de ensayos controlados aleatorios. Se realizaron búsquedas en Medline (vía Ovid), Registro de Ensayos Controlados (Cochrane Central Register of Controlled Trials, CENTRAL), Embase, PsycInfo, Web of Science, repositorio de Clinical Trials, literatura gris y búsquedas manuales desde su inicio hasta noviembre de 2022 para obtener estudios relevantes sin restricción de idioma. Se utilizaron los siguientes criterios de inclusión para determinar su elegibilidad: ensayos controlados aleatorios (ECA) en adultos diagnosticados con trastorno depresivo mayor que no consumían medicación antidepresiva ni asistían a terapia psicológica, con o sin la presencia de enfermedades crónicas transmisibles o no transmisibles, que comparaban las modalidades de ejercicio físico con la terapia habitual, el ejercicio cuerpo-mente o no ejercicio. Se excluyeron los ensayos controlados aleatorios en desarrollo con embarazadas y adultos con otros trastornos de salud mental como el trastorno bipolar y la ansiedad. El riesgo de sesgo y la calidad de la evidencia se evaluaron mediante la herramienta de riesgo de sesgo II de Cochrane y GRADE, respectivamente. Los resultados principales fueron los síntomas depresivos medidos mediante escalas de depresión validadas después de la intervención. Resultados: Los nueve ECA incluyeron 678 adultos (211 hombres, 31,12% y 467 mujeres, 68,88%) entre 20 y 72 años. La diferencia de medias estandarizada (DME) agrupada de los 7 ensayos (12 intervenciones), calculada mediante el modelo de efectos aleatorios, fue -0,27 IC del 95% [-0,58; 0,04] p = 0,09, lo que indica un efecto clínico pequeño a favor del ejercicio en las puntuaciones de los instrumentos que evalúan los síntomas depresivos, I^2 = 76%. Los análisis de sensibilidad mostraron un tamaño del efecto moderado, en comparación con los resultados primarios, a favor del ejercicio físico: - 0,58 [-1,15, -0,01]. Incluso mostraron significancia estadística: (P = 0,05); I^2 = 85%. Los análisis de subgrupos demostraron que la intervención (es decir, <12 semanas de duración, frecuencia 5 por 150 minutos por semana, a alta intensidad y con supervisión) y las características (es decir, menos de 50 años, sobrepeso y obesidad, y diagnóstico de depresión) podrían influir en el efecto general del tratamiento. Discusión: Se encontró evidencia de calidad baja a muy baja que apoya el efecto del ejercicio físico, en comparación con el tratamiento habitual, el ejercicio cuerpo-mente o no hacer nada, sobre los síntomas del trastorno depresivo mayor. El ejercicio físico es seguro, aunque produce eventos adversos que se pueden controlar fácilmente. La certeza de la evidencia se disminuyó debido a las limitaciones metodológicas, la inconsistencia y la imprecisión. Estos son resultados preliminares, se requieren ensayos controlados aleatorios bien diseñados e informados.

Palabras llave: revisión sistémica; metaanálisis; trastorno depresivo mayor; ejercicio físico.

Qualidade do sono em idosos fisicamente ativos: uma análise observacional e comparativa

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Resumo : Alterações biológicas durante o envelhecimento resultam reduzem o tempo, qualidade, e profundidade do sono. O exercício físico de forma regularmente é considerada um adjuvante no controle e atenuação de distúrbios de sono em pessoas idosas. Este foi um estudo observacional e comparativo, que objetivou avaliar a qualidade do sono de 40 idosos treinadas (31 mulheres e 9 homens) que participaram de um programa de treinamento multicomponente, durante 6 meses, 3 vezes por semana, de 09:00 às 10:00 no projeto "+Idade+Saúde" no departamento de desporto do Instituto Politécnico de Bragança (IPB), Portugal. Avaliamos a qualidade do sono por meio da escala de Pittsburgh adaptada para Portugal. As análises estatísticas foram conduzidas na linguagem de programação Python ™ versão 3.11.2. As variáveis foram reportadas em média e desvio padrão, valores absolutos e percentuais. O teste de qui-quadrados de duas proporções simples (X^2) foi utilizado para comparar a frequência de participantes com e sem distúrbios de sono. Consideramos o intervalo de confiança de 95% ($p < 0,05$) para a significância estatística, e calculamos o tamanho de efeito (TE) pelo V de Crámer (V), ($\leq 0,10$ = pequeno, $\geq 0,30$= moderado, e $\geq 0,50$ = grande). Encontramos números superiores de participantes com distúrbios de sono na amostra total [normalidade = 14 (35%); distúrbios de sono = 26 (65%), X2 = 4,242 (39), $p < 0,001$, V = 0, 52, TE grande], no sexo feminino [normalidade = 11 (27,5%); distúrbios de sono = 20 (64,5%), X2 = 5,253 (30), $p < 0,001$ V = 0, 76, TE grande], e no sexo masculino [normalidade = 3 (33,3%); distúrbios de sono = 6 (67%), X2 = 4,808 (8), $p < 0,001$ V = 0, 98, TE grande]. Concluímos que elevadas taxas de distúrbios de sono foram encontradas em idosos treinados independe do sexo.

Palavras-Chave: Hábitos de sono, envelhecimento, exercício físico, treinamento multicomponente, qualidade de vida.

Análisis de la formación en inclusión y atención a la diversidad del profesorado de educación física de El Salvador

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Resumo: El siglo XXI se presenta como un periodo de cambio social, en el que la inclusión es un reto para toda la sociedad. El profesorado de educación física debe responder a este reto y dar cabida en sus clases y sus actividades a todo el alumnado presente en los grupos. Esto significa que los docentes de educación física deben ser profesionales bien formados y comprometidos, no sólo con su profesión sino con el carácter inclusivo que debe predominar en su desarrollo. El objetivo de este trabajo es es analizar la formación del profesorado de educación física de El Salvador y su necesidad de formación en relación a la inclusión educativa, para atender las necesidades educativas especiales del alumnado que requiere apoyos Se utilizó un diseño de investigación no experimental, descriptivo, tipo encuesta. Los profesores participantes erán un total de 63 profesores de etapas educativas diferentes que iban a recibir un curso de formación en inclusión educativa para alumnado con discapacidad visual. Para la recogida de la información se utilizo un cuestionario elaborados ad hoc modificando algunos utilizados en investigaciones para la valoración de la sensibilidad y la formación del profesorado de educación física hacia la discapacidad. Entre los resultados encontramos la necesidad de un cambio en la formación inicial y permanente que se enfoque a la atención del alumnado con diversidad, las dificultades de atender la diversidad en un entorno no adaptado y sin materiales, la importancia del pensamiento del profesorado y de las culturas organizativas que apoyen la inclusión y de colaboración entre centro y profesionales. Aunque los cambios necesarios para la inclusión son muchos como conclusión esencial que se extrae de los resultados es la importancia de la actitud y la aptitud del profesorado ante la situación de necesidad y de inclusión dentro del área de educación física.

Palavras-Chave: Inclusión educativa, atención a la diversidad, formación del profesorado y educación física.

Análisis de la fidelidad de la implementación en un programa de Desarrollo Positivo en Jóvenes a través del deporte competitivo

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Resumo : El Desarrollo Positivo en Jóvenes (PYD) es una concepción del desarrollo basada en las capacidades, en la cual los niños y adolescentes son vistos como recursos a desarrollar más que como problemas que resolver. Los programas de PYD a través del deporte pueden proporcionar oportunidades para los jóvenes de ser responsables y de aprender las habilidades necesarias para tener éxito en su vida diaria, y han ido adquiriendo una mayor relevancia en la literatura científica. Sin embargo, la fidelidad de la implementación ha sido tradicionalmente obviada en las investigaciones que aplicaban este tipo de programas, siendo habitualmente un punto débil de éstas. Por ello, el objetivo de este trabajo fue analizar la fidelidad de la implementación de un programa de PYD surgido de la hibridación de los modelos de Responsabilidad Personal y Social y de Educación Deportiva en un equipo femenino de voleibol de competición. Participaron 15 chicas de entre 8 y 10 años y un entrenador de 26 años, pertenecientes a un club de voleibol de Sevilla (España). Los datos se recogieron mediante grabaciones de cuatro sesiones de entrenamiento completas distribuidas a lo largo de la intervención, las cuales fueron analizadas utilizando la metodología observacional por dos observadores independientes mediante el instrumento de observación Tool for Assessing Responsibility-based Education (TARE) 2.0. Los resultados mostraron que las estrategias metodológicas y las conductas de las jugadoras presentaron una alta consistencia y aplicabilidad temporal, manteniendo a lo largo de toda la intervención una elevada calidad de la implementación. Por tanto, el programa de intervención se ha implementado de forma satisfactoria y durante el mismo se han dado por parte de las deportistas conductas propicias para facilitar la adquisición de habilidades para la vida. Además, los resultados ayudan a entender e interpretar los efectos de los programas de PYD sobre los participantes.

Palavras-Chave: Metodología observacional; Responsabilidad personal y social; Educación deportiva; Hibridación; Voleibol.

Barreras existentes en la práctica deportiva en el fútbol femenino profesional

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Resumo: En los últimos años, el fútbol femenino ha ido creciendo en importancia para la sociedad, llegando hace unos años a profesionalizarse oficialmente en España. Sin embargo, existen todavía múltiples factores que se desconocen de este deporte. Por ello, se antoja fundamental estudiar y analizar en profundidad la percepción de las futbolistas, cuyas experiencias y vivencias personales y deportivas pueden arrojar luz a este campo de estudio que ha sido poco abordado en la literatura científica existente. El objetivo principal de este estudio fue conocer e identificar las barreras que dificultan la práctica deportiva percibidas por jugadoras profesionales de fútbol en España a lo largo de sus carreras deportivas. La muestra estaba compuesta por cuatro mujeres de dos equipos diferentes de La Liga Iberdrola (primera división nacional de fútbol femenino). El estudio empleó una metodología cualitativa, siguiendo un diseño fenomenológico, y se empleó la entrevista semiestructurada para la recolección de datos. Los resultados mostraron que las principales barreras en la práctica percibidas por las participantes fueron el practicar un deporte eminentemente masculino, el aspecto físico y la discriminación por género, destacando principalmente que las diferencias entre hombres y mujeres siguen existiendo en la actualidad en todos los ámbitos del fútbol, aunque se están reduciendo con respecto a años anteriores. Como conclusión, los resultados obtenidos en este estudio, junto con los que se han expuesto en la literatura científica en este campo de estudio, permiten tener una visión clara y realista de las barreras en la práctica deportiva a las que se enfrentan las jugadoras de fútbol femenino profesionales, facilitando la toma de decisiones de políticos y responsables de las federaciones para llevar a cabo acciones específicas para la mejora global del fútbol femenino profesional.

Palavras-Chave: Fútbol femenino, Profesional, Recursos, Facilitadores, Competición

Recursos y facilitadores de la práctica deportiva de competición en el fútbol femenino profesional

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Resumo: A pesar de que hoy en día el fútbol femenino es un tema al alza, aún hay muchos factores que se desconocen de él. Por ello, es importante estudiar y analizar en profundidad la visión de los agentes más importantes de dicha disciplina, las propias futbolistas, ya que son ellas desde su experiencia personal y vivencias las que más información pueden aportar en relación con su deporte, el cual han desarrollado durante la mayor parte de sus vidas. El objetivo de este estudio fue conocer e identificar los recursos y elementos facilitadores percibidos por jugadoras profesionales en España a lo largo de sus carreras deportivas. En el estudio participaron cuatro mujeres de dos equipos diferentes de La Liga Iberdrola (primera división nacional de fútbol femenino), usándose la entrevista semiestructurada para la recolección de datos, siguiendo una metodología cualitativa con un diseño fenomenológico. Los resultados muestran que los principales recursos y elementos facilitadores percibidos por las deportistas fueron el cuerpo técnico, el entorno social y los valores personales. También cabe destacar que las diferencias entre hombres y mujeres en un deporte tradicionalmente masculino siguen existiendo en la actualidad en todos los ámbitos de este, aunque se están reduciendo con respecto a años anteriores. A modo de conclusión, los resultados obtenidos en este estudio, junto con los que se han encontrado y relacionado en algunos estudios previos, permiten confeccionar una amplia lista de recursos y elementos facilitadores que reflejan la realidad de las jugadoras de fútbol femenino y que, por tanto, permiten la actuación directa para la mejora global de dicha realidad.

Palavras-Chave: Fútbol femenino, Profesional, Recursos, Facilitadores, Competición

Análisis de mejora en el rendimiento en nadadores no profesionales que participan en competiciones oficiales, utilizando un entrenamiento de alto volumen.

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Resumo: INTRODUCCIÓN: En la actualidad los entrenadores siguen sometiendo a los nadadores que compiten a entrenamientos de alto volumen a baja intensidad (HVT), con el objetivo final de mejorar el rendimiento (Nugent, et al., 2017; Tate et al., 2012). Pero este entrenamiento tradicional ha sido muy cuestionada en cuanto a su efectividad, debido a que la gran mayoría de las pruebas que se acostumbran a realizar en las competiciones de natación suelen durar poco tiempo (Aspenes, y Karlsen, 2012; Costa, Bragada, Marinho, Silva, y Barbosa, 2012; Costill et al., 1991; Lang y Light, 2010). El objetivo de este estudio es investigar la efectividad de la aplicación de un entrenamiento de alto volumen a baja intensidad en nadadores competitivos y el efecto que provoca en su rendimiento. MÉTODOS: Durante 12 semanas, 145 nadadores amateurs participantes en competiciones oficiales con diferentes clubes de natación, Comunidad Valenciana (España) participaron en esta investigación. Con edades comprendidas entre 6 y 17 años. Todos los nadadores llevaron a cabo la prueba de crol antes, durante y después del estudio. Realizaron un entrenamiento tradicional de 6 horas, distribuidos en 3 días por semana. El entrenamiento (HVT) incluyó series dedicadas a la técnica, a la respiración bilateral y al desplazamiento. La prueba de velocidad crítica de natación (CS) y la prueba de Swolf se utilizaron como herramientas para controlar el rendimiento, además de los tiempos obtenidos en las competiciones. RESULTADOS: Hubo mejoras significativas en el rendimiento, independientemente del sexo del nadador. Un 75,3% de nadadores mejoraron sus marcas personales. CONCLUSIÓN: El rendimiento en nadadores no profesionales que participan en competiciones oficiales mejoró con la realización de un programa de entrenamiento de 12 semanas, basado en un entrenamiento de alto volumen a baja intensidad.

Palabras clave: Entrenamiento tradicional, alto volumen a baja intensidad, técnica, nadadores amateurs, competiciones oficiales.

Consumo alimentar e desempenho de corredores de resistência suplementados com suco de beterraba rica em nitrato

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Resumo: Obter um status nutricional é fundamental para praticantes de corrida de resistência em virtude das demandas energéticas, apresentando um impacto no desempenho. Uma vez que o sistema de energia neste tipo de modalidade é utilizado com bastante vigor durante os treinamentos, competições e recuperação. Junto a isso, suplementos esportivos vêm sendo investigados para auxiliar nestas tarefas, como é o caso do nitrato (NO_{3-}), cuja função é contribuir nos processos como consumo de O_2 e contratilidade das fibras musculares, a exemplo, após a sua conversão no organismo a óxido nítrico. Preponderante a esses argumentos, buscamos investigar o consumo alimentar de corredores de resistência amadores e submetê-los a um contra-relógio de 3.200m após a ingestão aguda da suplementação de NO3- para análise de desempenho. A pesquisa contou com 13 homens (25±4,7 anos de idade, % de G 6,7±3,5) engajados com a corrida de rua (6,0±4,9 anos), aos quais foram sujeitados a um crossover, randomizados. O estudo foi prosseguido por 2 etapas, sendo: 1º) Referente as instruções para o preenchimento de um recordatório alimentar 24h. 2º) Dividiu-se em 2 visitas separadas por um período de 7 dias, onde 2h após a ingestão da suplementação de NO_{3-} (~6,4mmol) ou placebo (Kapo®) os participantes foram submetidos a contra-relógio de 3.200m na pista de atletismo, anotando tempo. Utilizou-se estatística descritiva, os testes Kolmogorov-Smirnov e Shapiro-Wilk (SPSS® 21.0). O tempo nos 3.200m obteve uma redução de 2,6s quando suplementado com NO_{3-} (SUP 720,0s ± 83,7vs.PLA 722,6s ± 81,5), sem diferenças significativas. Já os macronutrientes seguiram as determinadas médias ptn: 1,60g/kg ±0,91; lip: 0,70g/kg ± 0,64; carb 3,97g/kg±2,75. Apesar de observar um resultado ainda que mínimo na corrida, mas satisfatório, é necessário reportar o déficit de um macronutriente fundamental, o carboidrato, de acordo com as recomendações nutricionais diárias (5-8g/kg de peso/SBME), podendo afetar negativamente o desempenho nestes eventos.

Palavras-Chave: Desempenho Esportivo. Corrida. Óxido Nítrico. Consumo Alimentar. Carboidrato.

Analizando la efectividad de la suplementación nutricional sobre el rendimiento en natación

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Resumen: Introducción: La ingesta de suplementos nutricionales (SN) es una práctica común en la población deportista, independientemente de la modalidad, sexo o nivel competitivo. Instituciones como el Comité Olímpico Internacional (COI) han categorizado la efectivdad de los SN en función de los efectos demostrados sobre el rendimiento en función del nivel de evidencia científica demostrado. La creatina, cafeína, bicarbonato sódico, β-alanina y nitrato han demostrado tener un nivel de evidencia científico alto, si bien, los efectos podrían depender de las características mecánicas y metabólicas de cada modalidad deportiva. Objetivo: Analizar los efectos de SN con un alto nivel de evidencia científico sobre el rendimiento en natación. Método: Se realizó una búsqueda de artículos usando palabras clave separadas por conectores booleanos en las siguientes bases de datos: Dialnet, Directory of Open Access Journals, Pubmed, Scielo, Scopus and SportDiscus. La estrategia de búsqueda usada fue la siguiente: (concepto 1) (supplement* OR "ergogenic aid") AND (concepto 2) (swimming OR swimmer OR "aquatic sport"). Resultados: 20 estudios fueron seleccionados para la revisión de los cuales 6 analizaron el efecto de la suplementación con creatina, 4 nitrato, 3 β-alanina, 2 bicarbonato sódico y cafeina mientras que 3 estudios analizaron el efecto combinado de la coingesta de bicarbonato sódico con creatina, β-alanina y cafeina. Conclusión: La suplementación con creatina podría ser ergogénica en natación (mejora en 4/6 estudios), especialmente durante protocolos intermitentes, al igual que la cafeína habiendo reportado mejoras en los estudios que se han centrado en el análisis de la efectividad de dicho suplemento. Además, el bicarbonato sódico ha demostrado tener un efecto ergogénico ante protocolos intermitentes y de media distancia, mientras que la suplementación con β-alanina se potencia en la co-ingesta con bicarbonato sódico. Los estudios de suplementación con nitrato no han demostrado tener efectos concluyentes sobre la efectividad de dicho supemento sobre la mejora en natación.

Palavras-Clave: ayuda ergogénica; ejercicio; nutrición; suplementación; natación

Exercício resistido e função física em mulheres idosas: protocolo de estudo para um ensaio randomizado controlado

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Resumo: As mulheres são mais suscetíveis a problemas de função física com o envelhecimento, em especial após a menopausa. No entanto, o treinamento resistido (TR) pode amenizar e/ou retardar esse declínio. Até o presente momento, este será o primeiro ensaio ranzomizado controlado a avaliar o efeito do treinamento resistido reforçado excentricamente (TRRE) sobre a função física e cognitiva de mulheres idosas. Este ensaio contará com dois grupos composto por mulheres inativas com 60 anos ou mais (n=22). Para a construção deste protocolo em ensaio clínico será considerado a Declaração *Spirit* 2013 e para garantir a integridade e reprodutibilidade utilizará a *Consensus on Exercise Reporting Template*. A intervenção consistirá em 16 sessões, 2 vezes por semana, incluindo sete exercícios de TRRE para membros inferiores e superiores. O grupo experimental (TRRE) utilizará um equipamento *multi-gym* com volantes inerciais, realizará 4 séries de 8 repetições, sempre na intensidade 10 da escala OMNI-RES. O grupo controle (TR tradicional) utilizará máquinas de musculação e pesos livres, realizará 4 séries de 8 a 12 repetições mantendo a intensidade entre 6 e 10 na escala OMNI-RES. Ambos os grupos terão mesmo tempo sob tensão e tempo de descanso entre séries e exercícios. O desfecho primário analisado será a função física e os desfechos secundários serão o risco de quedas, qualidade de vida, manifestações de força, composição corporal e danos adversos. Informações sociodemográficas e sinais vitais também serão avaliados. As mulheres serão designadas aleatoriamente para os grupos de intervenção e controle usando um *software* de número aleatório. O pesquisador principal e avaliador dos resultados serão cegos, bem como o pesquisador responsável pela estatística do estudo. O mascaramento será realizado por um pesquisador externo a partir da técnica de envelopes escondidos e opacos. O estudo será registrado como um ensaio clínico no clinicaltrial.gov.

Agradecimentos: A pesquisa terá apoio com bolsas CAPES e FAPEMIG.

Palavras-Chave: Desempenho físico funcional, envelhecimento, funcionalidade, mulher, treinamento de força.

Efecto del Entrenamiento de Fuerza con Restricción del Flujo Sanguíneo ante Cargas Bajas vs Cargas Altas

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Resumo : Objetivos: Analizar el efecto de dos protocolos de entrenamiento de fuerza con restricción del flujo sanguíneo que difieren en la carga empleada en el ejercicio de sentadilla completa. **Metodología**: Veintiocho hombres físicamente activos con experiencia en el ejercicio de sentadilla completa (SQ) (Edad: 23.6±4.2 años; Talla: 179.5±5.7 cm; Peso: 76.7±9.3 kg; 1RM: 102.8±19.7 kg; Fuerza Relativa: 1.33±0.16; POA: 230.4±17.3 mmHg), fueron asignados al azar en dos grupos: Cargas Altas (CA: 70-80% 1RM; n =14) o Cargas Bajas (40- 50% 1RM; n =14). Realizaron un programa de entrenamiento durante 8 semanas que consistió en realizar dos veces por semana 3 series de SQ, con una pérdida de velocidad en la serie (PV) del 20% y 2 minutos de recuperación entre series. Se aplicó una restricción del flujo sanguíneo del 50% de la POA. La diferencia entre grupos fue la intensidad utilizada, CA entrenó con cargas del 70-80% 1RM y CB del 40-50% 1RM. Las evaluaciones del Pre y Post entrenamiento incluyeron: altura de salto con contramovimiento (CMJ) y los test de 1RM y resistencia a la fatiga en SQ. **Resultados**: Sólo se encontró interacción significativa "grupo x tiempo" en la variable CMJ ($p < 0.05$). Se hallaron diferencias significativas intragrupo (pre-post) en ambos grupos para todas las variables analizadas ($p < 0.001$). Los tamaños del efecto (ES) para CA fueron: (CMJ: 1.52; 1RM: 0.71; MNR: 1.27; Fuerza Relativa: 1.08) y para CB: (CMJ: 0.63; 1RM: 0.62; MNR: 1.82; Fuerza Relativa: 0.94). **Conclusión**: El empleo de cargas altas o cargas bajas durante un programa de entrenamiento de fuerza con restricción del flujo sanguíneo caracterizado por un grado de esfuerzo bajo-moderado resultó en similares mejoras sobre el rendimiento físico, excepto para el salto vertical, en el que emplear cargas altas parece producir una ganancia adicional.

Palavras-Chave: Entrenamiento de Fuera basado en V elocidad; Pérdida de V elocidad; Entrenamiento en Oclusión; Rendimiento físico.

Relación entre medidas del rendimiento físico y entre asimetrías detectadas a través de múltiples test de campo: ¿Existe una influencia del estado madurativo?

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Resumen: Se han sugerido numerosas pruebas de campo para evaluar diferentes parámetros del rendimiento físico, y asimetrías entre extremidades, en jóvenes deportistas. Sin embargo, la escasez de tiempo y recursos humanos puede obligar a los entrenadores a tener que priorizar tan solo algunas de ellas. El conocimiento de las posibles relaciones entre pruebas, así como su interacción con el estado madurativo, podría ayudar al diseño de baterías de valoración más eficaces (máxima información en el menor tiempo posible) en el fútbol base. Los objetivos de este estudio fueron: (1) determinar la correlación entre puntuaciones del rendimiento, y entre asimetrías detectadas, para distintos test de campo, y (2) examinar la influencia de la maduración en el rendimiento y en asimetrías identificadas. Trescientos nueve jóvenes (10-19 años) jugadores de fútbol fueron evaluados de los siguientes test: y-balance, countermovement jump, single leg countermovement jump, drop vertical jump, standing long jump, single leg hop for distance, Illinois agility, 10-m sprint, and 20-m sprint. Los resultados revelaron correlaciones de moderadas a muy altas para el rendimiento en pruebas de salto, sprint y agilidad, pero relaciones débiles-moderadas entre estas pruebas y el y-balance test. Por el contrario, no se registró ninguna relación relevante entre asimetrías detectadas mediante diferentes pruebas unilaterales. Mientras que el rendimiento físico estuvo influenciado por el estado madurativo, el impacto de la maduración sobre las asimetrías entre extremidades fue limitado. El nivel de correlación (moderado-muy alto) reportado para las puntuaciones de rendimiento podría sugerir una sensibilidad al entrenamiento similar para pruebas de salto y sprint multidireccional; sin embargo, la baja varianza compartida sugiere que estas pruebas estarían evaluando capacidades diferentes y no deberían utilizarse indistintamente. La influencia de la maduración en el rendimiento físico hace necesaria la consideranción de esta variable al comparar e interpretar los resultados de las pruebas en jóvenes deportistas.

Palabras clave: fútbol, evaluación, valoración física, jóvenes, maduración.

Monitoramento do Controle da Carga de Treinamento dos Atletas de Ginástica Aeróbica Durante a Pandemia

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Resumo: Durante a pandemia de COVID- 19, o isolamento social impediu que atletas mantivessem a rotina habitual de treinamento, sendo que uma das alternativas encontradas foi a de adaptar as sessões de treino para serem realizadas dentro de casa. Com o intuito de auxiliar e supervisionar os atletas, a comissão técnica da Seleção Brasileira de Ginástica Aeróbica se organizou para ministrar o treinamento por meio de plataformas on-line. O presente trabalho teve como objetivo monitorar a carga de treino desses atletas durante seis semanas e avaliar se estava adequada. A pesquisa foi composta por 6 atletas (25 anos ± 5,2), de ambos os sexos, tendo sido coletada a duração e a PSE de cada sessão de treinamento. A partir dos valores encontrados, foi calculado a Carga Interna de Treinamento (CIT), o Strain e a Monotonia. Os dados foram avaliados através de análise descritiva pelo programa do excel e posteriormente uma análise de variância, pelo teste ANOVA de medições repetidas. A semana 3 teve diferença estatística entre as demais semanas na variável da CIT e a semana 6 também houve diferença, entretanto não houve diferença entre a semana 3 e a semana 6 (p*0.165). Foi observado que o valor da Monotonia não ultrapassou o valor que a literatura propõe, acima de 2.0 U.A., e que a variância da carga de treinamento foi bem distribuida ao decorrer desse período, onde a média mais alta foi 480 U.A. e mais baixa 153 U.A., sendo os valores mais baixos caracterizados por semanas regenerativas. Os métodos utilizados para monitoramento da carga de treinamento na atual realidade, foi adequada para o controle do treinamento, para não ser muito alta e ocasionar lesão e muito baixa para não haver adaptação, onde a Monotonia manteve os valores abaixos de 2 U.A. e havendo diferença estatíticas entre as semanas.

Palavras-Chave: Ginástica Aeróbica; Monitoramento de Carga; Carga Interna de Treinamento; Treinamento esportivo; Pandemia

Comparación entre diferentes métodos de cálculo del índice de fuerza dinámica: efecto sobre las recomendaciones de entrenamiento

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Resumen: Un índice de fuerza dinámica basado en impulsos (iDSI) considera que la expresión de la fuerza depende del tiempo en contraste con el DSI común basado en la fuerza máxima (fDSI) puede ser más revelador al considerar las recomendaciones de entrenamiento. Sin embargo, una limitación del iDSI es que cualquier cambio en la duración de la fase de propulsión (PPD) del salto con contramovimiento (CMJ) podría interferir y afectar las comparaciones longitudinales, por lo tanto, un iDSI de duración fija (por ejemplo, 250 ms) podría superar esta limitación. El propósito del estudio fue determinar el efecto de diferentes métodos de cálculo de DSI (fDSI, iDSI emparejado, iDSI fijo). Treinta y ocho atletas de deportes de equipo (mujeres = 13, hombres = 25, edad = 22,2□2,8 años, altura = 174,4□6,0 cm, masa = 74,9□11,9 kg) realizaron tres CMJ máximos y tres tirones isométricos de medio muslo (IMTP) Ensayos sobre placas de fuerza de muestreo a 1000 Hz. Los datos se analizaron utilizando una hoja de cálculo personalizada. Se identificaron la fuerza máxima de IMTP y la fuerza de propulsión máxima de CMJ y la PPD. El iDSI fijo se identificó a partir del inicio de IMTP de 200 ms, mientras que el iDSI coincidente se identificó a partir del inicio de IMTP coincidente con CMJ PPD. Los participantes se caracterizaron utilizando umbrales >0,80, 0,60-0,80 y <0,60 para entrenamiento de fuerza máxima, equilibrado y dinámico, respectivamente. La desviación estándar promedio de fDSI, iDSI fijo e iDSI emparejado fueron 0.82□0.12, 0.88□0.11 y 0.82□0.11, respectivamente. El iDSI fijo fue significativa y significativamente mayor que el fDSI y el iDSI emparejado (p<0,049, d>0,408), sin diferencia entre este último (p=1,000, d=0,007). Hubo grandes diferencias intraindividuales en las recomendaciones de entrenamiento, El 44,7 % de las recomendaciones fueron consistentes entre fDSI e iDSI emparejado y el 55,3 % fueron consistentes para fDSI e iDSI fijo, en cambio, hubo una mayor consistencia en las recomendaciones de entrenamiento entre iDSI fijo e iDSI emparejado (84,2 %). -expresión de fuerza dependiente en los cálculos de iDSI hay diferencias significativas en sus observaciones. Esta diferencia debe tenerse en cuenta al realizar un seguimiento del rendimiento físico a lo largo del tiempo, donde un iDSI fijo podría ser preferible para ser consistente. Sin embargo, los cálculos de iDSI podrían requerir umbrales específicos para categorizar adecuadamente a los atletas para recomendaciones específicas de entrenamiento.

Palabras clave: fuerza; impulso; salto con contramovimiento; tirón isométrico de la mitad del muslo; fase propulsora

Reprodutibilidade da medida do salto vertical a partir de dois métodos: um estudo piloto

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Resumo: A força explosiva de membros inferiores é umas das variáveis físicas importantes para o desempenho atlético/esportivo, principalmente em modalidades que exigem constantes acelerações e mudanças de direção. Para estimar a força explosiva utilizam-se os testes com saltos verticais. Um deles é o teste de impulsão vertical (PR), que é prático, de fácil realização e barato. Outro teste é o tapete de contato (PS) que estima a força explosiva por meio da altura do salto vertical, calculada pelo tempo de vôo, e da massa corporal de quem salta. O problema do presente trabalho se encontra em saber se o PR é válido em comparação com o PS e qual seria a reprodutibilidade da medida desses testes. Assim, este estudo objetivou analisar a reprodutibilidade e comparar a existência de concordância/discrepância entre dois testes de impulsão vertical. Participaram do estudo 20 indivíduos do sexo masculino (21,60±3,75 anos; 76,05±15,91 Kg; e 1,78±0,06 m). Os voluntários foram submetidos a duas avaliações de salto vertical, PR e PS simultaneamente, em dois dias distintos, com um intervalo de 48 horas, sob as mesmas condições e no mesmo horário do dia. Os resultados foram analisados por meio do cálculo do coeficiente de variação (CV) e do coeficiente de correlação intraclasse (CCI) com intervalo de confiança de 95% (IC95%) e nível de significância de 5%. Como principais resultados foram encontrados, para ambos os testes, um CV "baixo" (PS= 5%; PR= 7%) e um CCI com força de concordância "alta" a "muito alta" (PR= 0,854; IC95%=0,668;0,939; $p<0,001$; PS=0,917; IC95%=0,804;0,966; $p<0,001$). Conclui-se que ambos os testes PS e PR apresentaram concordâncias altas, com excelente reprodutibilidade de suas medidas. Assim, na ausência de um instrumento mais sofisticado como o tapete de contato, o PR pode ser utilizado como instrumento de estimativa da força explosiva de membros inferiores.

PALAVRAS-CHAVE: Saúde; Força muscular; Potência muscular; Salto vertical.

Uso de Suplementos Nutricionais en Esquiadores Turcos de Élite: Datos Preliminares

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Resumo: Atletas de esportes de inverno enfrentam desafios de aumento do gasto energético, utilização de glicogênio e perda de fluidos devido às condições ambientais frias. Suplementos nutricionais (NS) podem fornecer vários benefícios, como melhoria da saúde ou desempenho, treinamento mais eficaz e vantagem direta de desempenho para atletas de esportes de inverno, como esquiadores. Este estudo tem como objetivo investigar o consumo de NS em esquiadores de elite turcos de diferentes níveis de competição. Cinquenta e cinco esquiadores de elite do sexo masculino completaram a pesquisa específica on-line sobre o consumo de NS, que incluiu seções sobre demografia, esporte/treinamento e consumo de NS. No entanto, trinta participantes foram excluídos do estudo por serem menores de 18 anos. Foram analisadas as pesquisas de 25 atletas de elite (44,0% de todos os atletas em competições nacionais e 56,0% de todos em competições internacionais). As disciplinas dos participantes foram esqui alpino (76,0%), esqui cross-country (20%) e snowboarding (4%). 88,0% (n=22) dos participantes declararam que consumiram pelo menos um suplemento. Os NS mais consumidos foram vitamina D (16,0%), chá verde (16,0%), ácidos graxos ômega-3 (12,0%), vitamina C (12,0%), cafeína (12,0%) e proteína de soro de leite (12,0%). As principais razões para o consumo de NS foram aumentar o desempenho esportivo (32,0%) e cuidar da saúde (24,0%). Os locais de compra mais comuns foram farmácias (32,0%) e internet (16,0%). As principais fontes de motivação para o consumo de NS foram médicos (24,0%) e auto aconselhamento (20,0%). O consumo de NS apareceu moderadamente entre os esquiadores masculinos turcos. O uso inconsciente ou excessivo de NS pode prejudicar o desempenho e representar um risco para a saúde do atleta de esportes de inverno. Portanto, deve-se questionar, em futuros estudos, se os atletas possuem o conhecimento necessário para fazer uma escolha informada de forma médica, fisiológica, cultural e ética.

Palavras-Chave: substâncias ergogênicas; esquiar; nutrição; desempenho esportivo; suplementação

Protocolo de estudio para la aplicación de un programa de fútbol andando: observación de los efectos según el sexo

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Resumo: El Walking Football fue un deporte adaptado del fútbol tradicional creado en Reino Unido para combatir la inactividad física y reducir costes estatales. Surgió como una alternativa diferente para mejorar la salud, condición física y calidad de vida en personas mayores de 60 años, tanto en hombres como mujeres. Esta actividad podía ser beneficiosa para su salud y sus relaciones sociales. Desde la Facultad de Deportes de la Universidad de Extremadura se llevó a cabo un protocolo de estudio cuyo objetivo era aumentar la actividad física de estos colectivos. Se propuso medir la composición corporal, resistencia aeróbica, fuerza de tren superior, fuerza de tren inferior, velocidad-agilidad, flexibilidad, calidad de vida relacionada con la salud y felicidad. La propuesta contaba con un ensayo controlado aleatorio, con un grupo experimental mixto de hombres y mujeres para conocer los beneficios específicos para cada sexo. El principal valor añadido fue la adquisición de nuevos conocimientos sobre la aplicación de un método novedoso de programas de Walking Football en mujeres, ya que la mayoría de los estudios previos se enfocaron en hombres. Aunque el estudio estaba en proceso, se esperaba obtener diferencias significativas en las variables descritas y poder demostrar que el Walking Football podía ser una práctica beneficiosa e integradora tanto para mujeres y hombres.

Palavras-Chave: (5 palavras) Deporte adaptado, salud, inclusión, personas mayores, actividad física

Asociación entre valores de fuerza manual y capacidad cardiorrespiratoria en pacientes con diabetes mellitus tipo 2

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Abstract : El ejercicio físico se propone como una herramienta terapéutica para la prevención y el manejo de la diabetes mellitus tipo 2 (DM2). De esta manera, la evidencia científica sugiere que un mejor nivel de condición física, tanto en su componente cardiorrespiratorio como en el de fuerza, ayudará al control y manejo de la enfermedad y a prevenir posibles complicaciones. Dada la relevancia de ambas variables, el objetivo de este estudio fue examinar la relación existente entre los valores de fuerza y la capacidad cardiorrespiratoria en personas con DM2. En total fueron evaluados 95 participantes (53 hombres) diagnosticados con DM2. La capacidad cardiorrespiratoria fue analizada en condiciones de laboratorio, y para ello se llevó a cabo una prueba de esfuerzo incremental hasta el agotamiento en cicloergométro con calorimetría indirecta. La fuerza de prensión manual se evaluó con un dinamómetro (Takei tkk5401). Para determinar la relación entre los valores de fuerza y la capacidad cardiorrespiratoria se utilizaron correlaciones bivariadas lienales. El análisis de correlación de Pearson mostró una asociación significativa entre la fuerza de prensión manual y el VO_2 max ($r= 0.75$; $p<0,001$), donde a mayor fuerza de prensión manual, mayor fitness cardiorrespiratorio. Los resultados de este estudio muestran la relación existente entre la capacidad cardiorrespiratoria y los niveles de fuerza de prensión manual en personas con DM2, lo que podría permitir, por medio del simple análisis de la fuerza de agarre manual, estimar la condición física de un sujeto y llevar a cabo una valoración rápida y poco costosa de su condición de salud que podría resultar especialmente útil en individuos susceptibles de desarrollar DM2, aumentando su potencial de transferibilidad clínica.

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Keywords: condición física, fuerza, capacidad cardiorrespiratoria, ejercicio, diabetes

Asociación entre marcadores inflamatorios y condición física en pacientes con diabetes mellitus tipo 2

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Abstract: La interleucina 6 (IL-6) y la proteína C reactiva (PCR) son marcadores sanguíneos utilizados para determinar el perfil inflamatorio en pacientes con diabetes mellitus tipo 2 (DM2). El objetivo de este estudio fue examinar la relación entre la IL-6 y la PCR con el nivel de condición física y salud de sujetos con DM2. Un total de 95 sujetos (53 hombres) diagnosticados con DM2 fueron incluidos en el estudio. Los niveles en plasma de IL-6 y PCR se obtuvieron a través de una analítica basal. El consumo máximo de oxígeno (VO_2 max) se obtuvo por medio de un test incremental en cicloergometro mediante calorimetría indirecta. La fuerza de prensión manual se obtuvo a través de un dinamómetro (Takei tkk5401). El índice de masa corporal (IMC) se obtuvo a través del peso y la altura de los participantes. Para determinar la relación entre los marcadores inflamatorios y el resto de parámetros analizados en el estudio se utilizó un modelo de regresión lineal. El análisis de regresión lineal mostró una asociación significativa entre los niveles de IL-6 y el índice de masa corporal (β=0.279; p=0,007). Por otra parte, los niveles de PCR se asociaron significativamente con el IMC (β=0.332; p=<0.001), la fuerza de agarre manual (β=-0.415; p=0.030) y el VO_2 max (β= 0.282; p=0.041). Con los resultados de este estudio puede observarse cómo los pacientes con DM2 con peores niveles de IMC mostraron un perfil inflamatorio más alto. Sin embargo, mayores niveles de prensión manual se asociaron con un mejor perfil de PCR. Esto subraya la importancia de utilizar el ejercicio físico como una herramienta para incidir sobre los parámetros inflamatorios en personas con DM2.
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Keywords: inflamación, estado de salud, composición corporal, enfermedades metabólicas, diabetes

La Importancia del Sueño en el Rendimiento Deportivo The Importance of Sleep in Sport Perfomance

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Resumen: Introducción. La cantidad y calidad del sueño tiene un gran impacto en el rendimiento del deportista. Un patrón de sueño inadecuado produce una acumulación de fatiga que podría alterar el rendimiento cognitivo, y quizá también podría afectar al rendimiento físico del atleta. Sin embargo, no se conocen en profundidad cómo y a qué niveles afectan las deficiencias del sueño en el desempeño deportivo. **Objetivo.** El objetivo de esta revisión fue el de analizar el efecto de la calidad y cantidad del sueño inadecuado sobre el rendimiento deportivo de los deportistas. **Metodología.** Para ello se realizó una revisión sistemática siguiendo la metodología PRISMA. Se realizó una búsqueda en la base de datos Pubmed entre febrero y marzo del 2022, utilizando las palabras clave: sueño, rendimiento deportivo, privación, descanso y actividad física. **Resultados.** Cuatro de los estudios analizados en la revisión sistemática mostraron que con una privación de cuatro horas de sueño se producía una disminución entre el 4 y el 10% en el rendimiento de los deportistas, tanto en potencia como en resistencia. Así mismo, en otros tres estudios del análisis se encontró que se producían aumentos en la Escala de Esfuerzo Percibido (ERP) de los atletas, y en uno de ellos, también vieron alterada la percepción del dolor durante las pruebas. Otro de los parámetros clave que se mostró afectado en uno de los estudios fue la disminución de la cantidad de glucógeno muscular, 65 mililitros por kilogramo de peso. Aumentando el nivel de fatiga en los deportistas estudiados. Conclusión. Una privación del sueño de cuatro horas en los deportistas produce diversas consecuencias a nivel físico y mental, afectando al rendimiento deportivo y produciendo alteraciones en el estado de ánimo de los deportistas y sus expectativas de rendimiento.

Readaptación multidisciplinar de un futbolista profesional tras una luxación glenohumeral con rotura del labrum. Un caso de estudio.

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Abstract: La recuperación de una lesión tiene un impacto negativo en el bienestar, las habilidades de movimiento y el rendimiento general del deportista, no solo por la lesión en sí, sino también porque suele implicar un período de inmovilización, especialmente después de la cirugía, afectando a la fuerza, estado cardiorrespiratorio y factores psicosociales. Así, el objetivo del presente estudio fue desarrollar, bajo la supervisión de un fisioterapeuta y un entrenador de fuerza y acondicionamiento, y las directrices del cirujano que lo operó, una evaluación e intervención de las capacidades de un jugador de fútbol profesional enfocada principalmente en la fuerza de miembros superiores y otros aspectos psicosociales como el miedo, o la percepción del dolor.
Los resultados del estudio mostraron cambios significativamente positivos en el rango de movimiento, la percepción del dolor y la funcionalidad. Podemos concluir que un periodo de 12 semanas puede ser suficiente para cumplir con los criterios para el regreso a la competición en un futbolista profesional. Es necesario revisar si estos plazos y propuesta serían válidos para deportistas con mayores exigencias en el articulación glenohumeral como aquellos que participan en deportes que requieren lanzamientos por encima de la cabeza.

Potencia la suplementación con creatina la efectividad de un programa de entrenamiento excéntrico y estiramientos en deportistas con tendinopatía rotuliana?

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Resumo: Introducción: la tendinopatía rotuliana (TR) es una lesión común en modalidades deportivas que incluyen saltos, sprints repetidos o cambios de velocidad a alta velocidad. La TR se caracteriza por dolor en la rodilla y disminución de la fuerza. El entrenamiento eccentrico (EE) junto a estiramientos ha demostrado eficacia para ddisminuir la sintomatología. La suplementación con creatina ha demostrado optimizar las adaptaciones al entrenamiento de fuerza en población nada. El objetivo de este estudio fue analizar la efectividad de incluir un protocolo de suplementación con creatina a una intervención de EE y estiramientos sobre la potencia muscular y el dolor en deportistas con TR. Método: aleatoriamente, 26 deoportistas federados con Trse dividieron en un grupo de suplementación con creatina (Cr) o grupo control (C) (4 mujeres y 9 hombres en cada grupo). Todos los participantes ejecutaron 6 sesiones semanales de EE (3 series de 10 repeticiones de squat monopodal) y estiramientos de los flexores y extensores de rodilla. Además, los participantes de Cr ingirieron 5 g/día de creatina (Creapure®). El índice de masa corporal (IMC), dolor (medido mediante escala VISAP) y salto con contramovimiento (CMJ) se analizzó antes y después de 4 semanas. Se realizó un ANOVA de medidas repetidas (ANOVA-MR) con ajuste Post-Hoc Bonferroni. Resultados: No hubo diferencias en IMC ($p>0,05$), si bien, se observó un efecto para el tiempo en VISAP ($p<0,01$), pero no para la interacción tiempo·suplementcion ($p=0,20$). En el CMJ se observó una tendencia significativa en la interacción tiempo·suplementación ($p=0.06$), aunque sólo se observó una mejora estadísticamente significativa en Cr ($p<0,01$). Conclusión: cuatro semanas de EE y estiramientos no son suficientes para reducir el ddolor o incrementarl el CMJ en deportistas con TR, si bien, la adición de una suplementación con creatina (5 g/día) podría tener efectos adicionales sobre el rendimiento en CMJ. Esta mejora en el CMJ sin cambios en el IMC sugiere que la combinación de EE y estiramientos con un protocolo de suplementación con creatina provoca adaptaciones superiores a nivel neuromuscular.

Palavras-Chave: ayuda ergogénica; lesión; nutrición; terapia física; suplementación

Efectos del ciclo menstrual en la producción de fuerza y potencia muscular de mujeres jovenes eumenorreicas.

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Resúmen: El efecto del ciclo menstrual sobre la producción de fuerza y potencia ha sido estudiado ampliamente, sin embargo, la evidencia existente no permite establecer una conclusión definitiva. El objetivo del presente trabajo fue analizar las diferencias entre la fase lútea y folicular sobre la producción de fuerza y potencia muscular, por medio de una revisión sistemática y un estudio piloto experimental. La revisión sistemática se realizó utilizando las bases de datos Pubmed, Web of Science y SPORTdiscus, desde enero de 2012 a diciembre de 2022, utilizando las palabras clave: Ciclo menstrual y ejercicio de fuerza. En el estudio experimental, 5 mujeres entrenadas en fuerza (edad: 22,8±4,3 años; masa corporal: 64,3±11,2 kg) participaron en un diseño ciego, aleatorizado y cruzado en el que realizaron 3 visitas al laboratorio. Tras la sesión de familiarización y la obtención de la repetición máxima (1RM), las participantes realizaron un test de fuerza y potencia muscular consistente en la ejecución de 3 repeticiones al 25%1RM, 2 al 50%1RM, 1 al 75%1RM y 1 al 90%1RM para los ejercicios de press de banca y sentadilla, tanto en la fase lútea como en la folicular. En la revisión, se incluyeron 21 estudios, de los cuales 12 mostraron diferencias significativas entre fases. En el estudio experimental, se encontraron diferencias significativas en la fase lútea comparada con la fase folicular al 50%1RM para potencia máxima (Pmax,+6,7%;P=0,008) y media (Pmed,+8,9%;P=0,016), velocidad máxima (Vmax,+4,9%;P=0,003) y media (Vmed,+9,1%; P=0,018) y el RPD (+17,7%;P=0,017) en sentadilla, y en la Pmax (+7,8%;P=0,025), tiempo hasta Vmax (+6,1%;P=0,008) y Pmax (+15,7%;P=0,018) en press de banca. El estudio piloto experimental realizado parece indicar que durante la fase lútea la mujer podría producir mayor fuerza y potencia muscular, aunque son necesarias más investigaciones con protocolos experimentales homogéneos para dilucidar el efecto del ciclo menstrual sobre el rendimiento de fuerza.

Palabras clave: Ciclo menstrual, fuerza, potencia, mujer, hormonas sexuales.

Diferencias entre las ecuaciones antropométricas para la estimación de la masa muscular.

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Resumen: En el ámbito de las ciencias del deporte ha aumentado el interés por la estimación de la masa muscular (MM), especialmente entre los individuos que entrenan la fuerza (1), lo que ha llevado al desarrollo de diferentes métodos para evaluarla. Existen diferentes herramientas para cuantificar la MM (2), entre las cuales la antropometría ha mostrado la relación fiabilidad/práctica más adecuada (3). Aunque esta técnica se encuentre ampliamente difundida en el ámbito científico, se han generado pocas ecuaciones para la estimación de la MM, y dentro de las cuales, se desconoce cuál ofrece los resultados más fiables y si éstos son equivalentes entre las fórmulas disponibles. El objetivo de este estudio fue comparar los valores de MM obtenidos mediante diversas ecuaciones antropométricas en adultos sanos y activos que entrenen la fuerza de manera recreacional. Se incluyó en la evaluación a un total de 130 individuos físicamente activos con edades comprendidas entre los 18 y los 45 años. La MM se estimó en kilogramos utilizando ecuaciones de Kerr, Lee, Poortmans y Matiegka. Se observaron diferencias estadísticamente significativas en los valores de MM obtenidos por las ecuaciones analizadas ($p<0,001$-$0,001$), así como una falta de concordancia entre las ecuaciones de estimación del MM ($p>0,05$). En conclusión, se observaron diferencias significativas en los valores de MM obtenidos de adultos activos, sanos y que entrenan fuerza de manera recreativa al utilizar diferentes ecuaciones antropometricas, lo que indica que los resultados de MM obtenidos con las distintas fórmulas no son comparables entre si. Esta diferencia podría atribuirse a variaciones en el tamaño de la muestra, las características de los participantes y las variables analizadas. Por lo tanto, se recomienda utilizar la misma ecuación de estimación al comparar individuos con tablas de referencia o analizar su progreso, ya que estas ecuaciones no son intercambiables.

Palabras clave: Composición corporal; ecuación; perímetros; antropometría, masa muscular.

Efecto de la actividad sexual sobre el rendimiento deportivo, sobre el daño muscular y sobre la percepción de esfuerzo. Un estudio piloto en deportistas masculinos de alto nivel realizado en el laboratorio.

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Resumen: La actividad sexual precompetitiva se ha considerado una posible causa de rendimiento reducido porque promovía la tranquilidad y una sensación de relajación. Hipotetizamos que el rendimiento atlético óptimo está influido por una variedad de factores, incluida la actividad sexual antes de la competición. El propósito de este estudio fue investigar los efectos de la actividad sexual sobre el rendimiento deportivo en un test de ciclo ergómetro, sobre el daño muscular, la inflamación y índice de Esfuerzo Percibido (RPE) en atletas altamente entrenados. Se evaluó en dos días de prueba realizados en un entorno de laboratorio, comparando y un día sin actividad sexual (T0), y un día con actividad sexual (masturbación) (T0) realizada 30 minutos previos a la prueba incremental de ejercicio, con una separación de 1 semana. Veintiún deportistas masculinos (22,05 ± 1,42 años) de alto nivel, formados por 8 jugadores de equipo, 7 atletas de resistencia, y 4 judocas y 2 boxeadores, participaron en el estudio. Cada sujeto completó lo siguiente en cada día de prueba: un test incremental de ejercicio. Se obtuvieron muestras de sangre de biomarcadores (lactato deshidrogenasa (LDH), creatina quinasa (CK), Mioglobina (Mb), proteína C reactiva (PCR), concentración de lactato (LAC) y se controló la actividad cardíaca (HR), la potencia relativa (RPw), el tiempo total de prueba (TT), y RPE (Borg-CR10). Se lograron diferencias significativamente ($p \leq 0.05$) mayores para los valores de TT, HR, LDH y una tendencia no significativa ($p \geq 0.05$) mayor en RPw y PCR después de la actividad sexual. Además, se observó una diferencia no significativa ($p \geq 0.05$) menor para LAC, CK, Mb y RPE en T1. Estos hallazgos demostrarían que el orgasmo inducido por la masturbación podría tener efectos agudos positivos incrementando el rendimiento deportivo, atenuando el daño muscular y disminuyendo respuesta al esfuerzo físico en atletas hombres altamente entrenados.

Palabras Clave: (5 palabras) abstinencia, sexo, rendimiento deportivo, daño muscular, percepción de esfuerzo

A suplementação de diferentes doses de cafeína interferem na resistência muscular?

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Resumo: A cafeina é um recurso ergogênico nutricional que provoca efeitos principalmente no sistema nervoso central, bloqueando os receptores de adenosina. Através dessas ações, sua suplementação pode promover o aumento da força e da resistência muscular durante a realização de um exercício resistido (TREXLER et al., 2016). Sendo assim, o estudo teve como objetivo verificar se as diferentes doses (210 mg e 420 mg) da suplementação aguda de cafeína interferem no desempenho de um teste de resistência neuromuscular. Participaram do estudo 11 voluntários (25,7 ± 5,9 anos; 71,1 ± 11,0 Kg; 170,72 ± 6,6 cm) do sexo masculino. Ao todo aconteceram 6 visitas presenciais, onde a primeira teve a entrega do TCLE, coleta das medidas antropométricas (peso e estatura) e o teste de 1RM para o exercício de supino reto (SR). A segunda visita (Baseline (BA)) 48 horas após a primeira, contou com o teste de resistência muscular no SR com 80% de 1RM, seguindo as recomendações de Hall et al (2021). As outras visitas (terceira, quarta, quinta e sexta) contaram com a suplementação de cafeína baixa (CB = 210 mg) e alta (CA = 420 mg), ou placebo baixo (PB = 230 mg) e alto (PA = 460 mg) 60 minutos pré-teste. O intervalo entres as visitas a partir da terceira foi de 7 dias. Foi utilizada a estatística descritiva e o teste Post-Hoc de Scheffé com um nível de significância de $p<0,05$. Não foram encontras diferenças significativas ($p > 0,05$) quando comparadas todas as condições entre elas, mas a suplementação de cafeína (CB = 12,09 ± 3,33; CA = 11,91 ± 3,53 *reps*) mostrou um aumento no número de repetições em comparação ao BA (10,18 ± 2,71 *reps*), melhorando a resistência muscular. Considera-se que a cafeína influenciou no desempenho do teste, aumentando a resistência muscular de um exercício resistido.

Palavras-Chave: Cafeína; Treinamento resistido; Suplementação; Resistência muscular; Força muscular

Análise de Aprendizado de Máquina da Relação entre Atividade Física e Densidade Mineral Óssea em Mulheres dos EUA.

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Resumo: INTRODUÇÃO: A osteoporose é uma condição que resulta em ossos frágeis e um risco aumentado de fraturas. O exercício é uma parte importante da prevenção desta condição. O National Health and Nutrition Examination Survey (NHANES) é um banco de dados que inclui medidas objetivas de atividade física e tempo sedentário para a população dos EUA. Algoritmos de aprendizado de máquina podem ser usados para explorar as relações dentro deste banco de dados, potencialmente levando a novas e úteis informações. O objetivo deste estudo foi investigar a relação entre atividade física objetivamente medida e densidade mineral óssea, bem como as variáveis que afetam essa relação. MÉTODOS: O estudo comparou a densidade mineral óssea (DMO) do colo do fêmur entre diferentes grupos étnicos usando o teste de Kruskal-Wallis. As comparações post hoc foram realizadas usando o teste de Wilcoxon com ajuste de Bonferroni. Em seguida, modelos de regressão foram desenvolvidos para explorar a associação entre a variável dependente (DMO do colo do fêmur) e as variáveis independentes (idade, massa corporal, força de preensão e tempo de atividade física vigorosa). Dois modelos de regressão diferentes foram desenvolvidos: regressão linear múltipla e regressão florestal aleatória com explicações aditivas de Shapley (SHAP).
RESULTADOS: A análise incluiu 1066 participantes. A massa corporal teve um efeito positivo na DMO do colo femoral, enquanto a idade teve um efeito negativo. A força de preensão teve um impacto maior no modelo do que o exercício vigoroso. O parâmetro R-quadrado, que mede a bondade do ajuste, foi de 48%, indicando que cerca de metade da variabilidade na DMO do colo femoral pode ser explicada pela idade, massa corporal, força de preensão e tempo de atividade física de intensidade vigorosa.
CONCLUSÃO: Os resultados do estudo poderiam ajudar a fornecer recomendações personalizadas de atividade física para indivíduos com base em sua idade, massa corporal e etnia. Os resultados sugerem que melhorar a força corporal pode ser mais benéfico para a saúde óssea do que aumentar o tempo de atividade física de intensidade vigorosa.

Palavras-Chave: osso, osteoporose, exercício, regressão, aprendizado de máquina.

Métodos Mais Acessivéis Para Mensuração da Altura do Salto DROP JUMP

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Resumo: O salto vertical (SV) Drop Jump (DJ) é muito utilizado por pesquisadores, treinadores e preparadores físicos pela sua simplicidade e riqueza de informações. Mas, métodos utilizados para mensurar a altura do salto considerados padrão ouro como, plataforma de força são de difícil acesso pelo preço e acessibilidade utilizando-o em campo. O App My Jump 2® (MJ) e o Software Kinovea® (SK) são dispositivos de baixo custo e acessíveis para utiliza-los em campo. O presente estudo tem como objetivo trazer métodos mais acessíveis e validos para medição da altura do DP. A pesquisa foi constituída por atletas profissionais de atletismo (N=17, 7 mulheres e 10 homens, idade 21,8 ± 2,6 anos, massa corporal= 67,1 ± 10,4kg, estatura= 173,8 ± 8,6cm). No primeiro momento da coleta de dados foram feitos as medidas antropométricas, estatura e massa muscular, em seguida foram direcionados para o aquecimento (10' de corrida e 3 saltos DJ para a familiarização), após o aquecimento os voluntários realizaram 3 saltos DJ com 30" de intervalo entre eles, os saltos foram feitos no Tapete de contato (TC) e simultaneamente gravados no plano frontal por um iphone 8 onde foi mensurado a altura do salto no app MJ® e no plano lateral por um smartphone *samsung* para análise do tempo de voo no Sk®, e posteriormente quantificar a altura do salto por uma formula matemática ($h = t^2 \times 1{,}22625$) (BALSALOBRE-FERNANDES et. al. 2014). Para análise dos dados utilizou-se o coeficiente de correlação interclasse (ICC), correlação de Person (r) para testar a correlação dos métodos com o TC. Todas os dados apresentaram distribuições normais ($p>0{,}05$). Na comparação do TC e MJ® ($r=0{,}994$; $ICC=0{,}994$; $IC=0{,}912\text{-}0{,}998$; $p<0{,}001$), TC com SK® ($r=0{,}976$; $ICC=0{,}988$; $IC=0{,}966\text{-}0{,}995$; $p<0{,}001$). Com os resultados apresentados concluímos que, MJ® e o SK® são métodos confiáveis e acessíveis para mensuração da altura do DJ.

Palavras-Chave: Salto Vertical; Drop Jump; My Jump 2; Software Kinovea; Altura de Salto;

Efeitos da suplementação aguda do suco de beterraba na resposta cardiovascular e hemodinâmica ao exercício resistido reforçado excentricamente: um ensaio randomizado, cruzado, triplo-cego e controlado por placebo

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Resumo: Supostamente, a suplementação com suco de beterraba poderia aumentar a biodisponibilidade de óxido nítrico, beneficiando a regulação de indicadores funcionais e fisiológicos relacionados ao desempenho esportivo devido à ação vasodilatadora e hipotensiva. Entretanto, seus efeitos na modulação do sistema cardiovascular em exercícios resistidos ainda não estão esclarecidos. O objetivo dessa pesquisa foi avaliar os efeitos da suplementação aguda do suco de beterraba na resposta cardiovascular e hemodinâmica ao exercício resistido reforçado excentricamente (ERRE). Trata-se de um ensaio randomizado cruzado, triplo-cego e controlado por placebo que foi desenvolvido com 15 homens (idade 22±3,64 anos). Após a randomização, os participantes da condição experimental receberam suco de beterraba contendo 400mg de nitrato padronizado e foram comparados à condição placebo (suco de uva comercial), sendo submetidos a um protocolo de ERRE, que consistiu em 4 séries de 12 repetições com intensidade de 100% da força concêntrica máxima e velocidade máxima de execução na fase concêntrica, com frenagem de movimento na fase excêntrica, intervalo entre as séries de 90'', no exercício de cadeira extensora. Imediatamente ao final de cada série, nas duas condições, avaliou-se a frequência cardíaca (FC), pressão arterial (PA), saturação de oxigênio (SaO_2), percepção subjetiva de esforço (PSE) e o tempo sob tensão (TST). Foram encontrados menor aumento da PA sistólica ($F=13,8$; $p=0,002$; $\eta2=0,5$) e da PA diastólica na última série ($F=3,58$; $p=0,042$; $\eta2=0,57$) em favor do suplemento. Entretanto, não houve diferença entre os grupos para a FC ($F=1,17$; $p=0,205$; $\eta2=0,11$), SaO_2 ($F=1,33$; $p=0,277$; $\eta2=0,15$), PSE ($F=0,63$; $p=0,443$; $\eta2=0,05$) e TST ($F=0,1$; $p=0,980$; $\eta2=0,05$). Conclui-se que a suplementação aguda de suco de beterraba induziu melhora hemodinâmica e diminuição da resistência vascular periférica em resposta ao ERRE, observada pelo menor aumento da PA sistólica e pela redução da PA diastólica na última série, quando comparada à condição placebo.

Palavras-Chave: Suco de beterraba; Nitrato; Treinamento de força; Resposta cardiovascular; Hemodinâmica.

Prevención de lesiones de hombro en deportes de golpeo o de lanzamiento: Revisión sistemática.

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Resumen: Introducción: En cuanto al índice lesional en deportes de golpeo y lanzamiento (por ejemplo: béisbol, tenis, baloncesto, balonmano o pádel), la prevención juega un papel muy importante, ya que los jugadores están sometidos a movimientos exigentes, repetitivos y con rangos extremos en la articulación del hombro. Algunos factores de riesgo, en los movimientos de lanzamiento o golpeo, por encima de la cabeza, (overhead), de las diferentes modalidades deportivas, pueden ser la base de las recomendaciones para la prevención de lesiones, como, el déficit de rotación interna glenohumeral, la fuerza del manguito de los rotadores externos y la discinesia escapular. **Metodología:** Se siguió el método Prisma para la realización de la revisión y se evaluó con las escalas RoB y PEDro. Se efectuó una búsqueda en las bases de datos Pubmed, Cochrane, Dialnet y ScienceDirect, en español e inglés. La selección de artículos se realizó con las palabras clave y los operadores boleanos "AND", "OR". **Resultados:** El total de artículos encontrados fueron 102 de los cuáles se seleccionaron 8 atendiendo a los criterios de inclusión y exclusión. La mayoría muestran factores de riesgo similares en los diferentes deportes overhead y también en gran parte, el programa de prevención es favorable. **Conclusión:** Respecto a la prevención de lesiones, se debería tener en cuenta que cada deporte tiene sus propias demandas biomecánicas y por ello, sería recomendable analizar los posibles factores de riesgo y realizar cada programa de prevención de forma individualizada, teniendo en cuenta los diferentes criterios para evitar lesiones futuras y volver en buen estado físico a la competición.

Palabras Clave: "Factores de riesgo", "Lesiones", "Prevención", "Deportes Overhead", "Hombro

Influencia del estado madurativo en la pérdida del rendimiento en el sprint con carga

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Resumen: Introducción: El proceso de maduración biológica puede variar entre individuos durante la etapa de la pubertad, y especialmente durante el estirón de la adolescencia. Esta variabilidad interindividual en la maduración biológica podría influir en el rendimiento deportivo, en la identificación de talentos o en los procesos de entrenamiento en jóvenes futbolistas. Los sprints o aceleraciones están presentes durante las acciones decisivas de los partidos de fútbol en jóvenes futbolistas, por lo que su optimización a través de las diferentes metodologías de entrenamiento podría resultar clave. **Objetivo:** Cuantificar la influencia del estado madurativo en la pérdida de rendimiento en la fase de aceleración (0 a 5 m), sprint (0 a 30 m) y velocidad máxima (20 a 30 m) del sprint, derivada de la inclusión de diferentes cargas (25% y 50% del peso corporal) en jóvenes futbolistas. **Metodología:** Un total de 56 jugadores participaron en el estudio a los cuales se les asigno un estado madurativo (pre-, mid-, y post-máxima velocidad de crecimiento [PHV]) de acuerdo con su edad somática, a través de la ecuación propuesta por Mirwald (pre = 23, mid = 17 y post = 16). Cada sujeto realizó 3 sprints (sin carga, con carga del 25% y del 50% de su peso corporal), el tiempo fue medido con la aplicación MySprint. **Resultados:** se encontraron mayores pérdidas de rendimiento en la fase de aceleración en las etapas pre- y mid-PHV, que en las etapas mid- y post-PHV. Sin embargo, las diferencias en la pérdida de rendimiento del sprint y de velocidad máxima es mayor entre los grupos mid- y post-PHV que en los grupos pre- y mid-PHV. Estos hallazgos podrían contribuir a mejorar los procesos de entrenamiento en adolescentes aprovechando las ventanas de oportunidad adecuando los estímulos correctos al estado madurativo del sujeto.

Palabras clave: adolescencia, maduración, sprint resistido, fuerza, velocidad máxima

Efectos del foco de atención y del entrenamiento sobre la carga mental y el aprendizaje de la arrancada.

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Abstract : Este estudio tenía como objetivo comparar la eficacia de dos estrategias de foco de atención y dos programaciones del entrenamiento diferentes en el aprendizaje de la técnica de la arrancada en adultos (20-22 años), para observar las diferencias en el aprendizaje y en la carga mental. Seis participantes, con ninguna experiencia en el entrenamiento de halterofilia, pero sí en el entrenamiento de fuerza, fueron divididos en tres grupos: grupo control con entrenamiento basado en entrenamiento de halterofilia tradicional con un foco de atención interno, grupo con foco externo y grupo con foco interno, ambos con entrenamiento basado en las características de los halterófilos. Aunque se ha investigado cómo los focos atencionales juegan un papel importante en un movimiento olímpico y las características importantes en los halterófilos han sido ampliamente investigadas, no se han tenido en cuenta ambas para realizar una intervención. Fue utilizado el RM para medir el máximo peso que pudieron levantar en la técnica de la arrancada antes después de ocho sesiones de entrenamiento, y el cuestionario NASA TLX para medir la carga mental a lo largo de toda la intervención, incluyendo las tomas de marca pre intervención y post intervención. Tras las ocho sesiones de entrenamiento, el grupo control mostró mayores mejoras porcentuales en la arrancada, en comparación con el grupo de foco externo y el grupo de foco interno, mientras los niveles de carga mental fueron menores en aquellos grupos que utilizaban un foco interno. Los presentes resultados indican que el uso de un foco de atención interno y un entrenamiento basado en el entrenamiento tradicional fue superior para la mejora de la técnica de la arrancada, además de que un foco interno produce menos carga mental que un foco externo.

Keywords: “Sport rehabilitation” “readaptation” “multidisciplinar” “assessment” “strength training”

Suplementação de Creatina e o seu efeito na Performance da impulsão

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Resumo: A suplementação é um tema bastante abordado na área do treino, mas será que é realmente necessária? Um dos compostos de suplementação mais usados e aceites quanto à sua efetividade é a creatina. Esta é usada por vários atletas, cada vez mais estudos têm comprovadoum aumento da massa muscular e da capacidade de exercício quando os treinos consistem em exercícios de curta duração e elevada intensidade. Além disso, está comprovado que a suplementação de creatina traz benefícios como a recuperação pós-exercício e a prevenção de lesões. A Creatina participa nas funções energéticas dentro da via anaeróbia alática, sendo um fator importante na produção de energia de atividades de curta duração. A creatina é catalisada pela Creatine Kinase, uma enzina que através da transferência de um grupo fosfato da creatina para o ADP, gera ATP para a produção de energia celular. Este estudo teve como objetivo estudar e avaliar a suplementação de creatina e o seu efeito na performance de atletas de impulsão. Em relação à toma da mesma, pode ser tomada em doses de 3-5 g/dia ou 0.1 g/kg demassa corporal/dia por indivíduos que pratiquem exercício e tenham uma alimentação e estilosde vida saudáveis. De acordo com estudos, a impulsão encaixa-se na Força Rápida. Seria de esperar que a Creatina tivesse influência de forma significativa sobre o treino de impulsão, devido a ser um treino de curta duração e de elevada intensidade. No entanto apesar da força rápida ser influenciada em vários aspetos pela toma da creatina, verifica-se que as alterações são pouco significativas, podendo concluir que a suplementação de creatina para o treino específico de impulsão não é tão rentável como seria de esperar e como é, por exemplo, para um treino de hipertrofia muscular que também é um treino de curta duração e alta intensidade.

Palavras-Chave: Creatina; Performance; Suplementação; Impulsão; Meta-Analysis

A importância da hidratação na performance desportiva

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Resumo: Nas mais variadas modalidades desportivas o resultado da junção de vários fatores, como o treino, a nutrição e o repouso resulta na performance. Para uma melhor performance não é suficiente apresentar somente níveis nutricionais de qualidade, mas também uma boa hidratação ao longo do dia, e em especial para quem pratica uma modalidade pois deve ter em conta o gasto hídrico no treino ou na prova. A hidratação não é apenas fulcral para um melhor rendimento da performance mas também de extrema importância na fase da recuperação pós-treino ou prova. Para um atleta a hidratação apresenta diferentes variáveis a ter em conta, tal como o tipo de atividade, a idade, o peso, a altura, o treino/ a prova que realizou, etc. Portanto, o nosso estudo teve enfoque na análise da importância da hidratação na performance desportiva e observar o impacto da mesma no rendimento desportivo. A hidratação, fundamentalmente, é a reposição de água no organismo para que a perda hídrica seja, simultaneamente um meio de transporte e distribuição de vitaminas, minerais, glicose, oxigénioe outros nutrientes para as células. A maior parte da água que se encontra no organismo está situada no citoplasma e proporciona a realização das funções metabólicas do organismo. Os benefícios da hidratação atuam em diferentes aspetos dependente do sujeito, atuando com maior incidência no cérebro e na pele. As doses recomendadas de ingestão de água são em média dois litros por dia, no entanto varia muito dependente da faixa etária: verificámos que os jovens (até aos 17 anos) têm de consumir 40 ml por cada kg, já as pessoas dos 18 aos 55 anos devem consumir 35 ml por cada kg, as pessoas com idades restritas entre os 55 e os 65 anos recomenda-se que bebam 30 ml por cada kg e, por fim, os indivíduos com mais de 66 anos devem beber cerca de 25 ml por cada kg.

Palavras Chave: Hidratação, Exercício; Performance Desportiva.

Impacto na alimentação com base nos hidratos decarbono antes de uma competição

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Resumo: Quando se fala de alta competição, todos os fatores e pormenores contam para chegar ao sucesso. A alimentação não é exceção, sendo considerada um fator quase tão importante quanto o treino. Através de uma dieta equilibrada e programada é possível alcançar o sucesso. O objetivo do nosso estudo foi analisar a importância dos hidratos de carbono antes de uma competição. Com base em estudos podemos constatar que a energia utilizada pelos atletas é fornecida pelos glicogénios armazenados nos músculos, derivados dos hidratos de carbono. Os atletas devem adaptar o seu consumo de hidratos de carbono de em função e exigência do treino que vão realizar. Antes de uma competição o cenário torna-se umpouco diferente, o atleta deve ingerir uma quantidade acentuada de hidratos de carbono pois necessita do máximo de energia possível para obter o melhor resultado possível. Para competições de curta duração (até 1h) não se deve ingerir grandes quantidades de carboidratos ou então hidratos de rápida absorção. Estima-se que a quantidade recomendada para desportos de média duração é de 30g a 60g de hidratos de carbono por atleta, já desportos com duração superior a 2h30m podem beneficiar da ingestão de hidratos de carbono até 90g por atleta. Alimentos com diferentes tipos de carboidratos na sua composição podem maximizar a sua absorção. De acordo com a análise realizada foi possível constatar que os hidratos decarbono têm um papel extremamente positivo em aspetos energéticos, o que beneficia o a disposição do atleta para o treino/competição.

Palavras-Chave: Hidratos de carbono, Alta-Competição, Performance, Dieta.

Impacto da suplementação de proteína antes e depois o treino

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Resumo: A suplementação alimentar consiste em substâncias químicas que são produzidas especialmente para complementar a alimentação. Podem ser compostos de todas as vitaminas e minerais e, por isso, são conhecidos como multivitamínicos ou podem conter apenas determinadas substâncias, como ocorre no caso da Creatina, que é indicada, especialmente, para quem pratica algum tipo de atividade física. A proteína é uma substância formada a partir de um conjunto de aminoácidos ligados entre si. Estão presentes em todos os processos celulares e desempenham várias funções no organismo. Os suplementos proteicos são frequentemente consumidos por atletas e adultos recreativamente ativos para alcançar maiores ganhos de massa muscular e força com o objetivo de melhorar o seu desempenho físico. O nosso objetivo foi verificar o impacto dos efeitos da suplementação de proteína na massa musculare força. Na realização deste estudo foram realizadas várias pesquisas de artigos referentes ao nosso tema no motor de busca "*PubMed*". Resultados: A ingestão de proteínas (2,2-3,0 g/kg/dia) deve ser distribuída ao longo do dia (3-6 refeições), garantindo em cada refeição uma quantidade adequada de proteína (0,40-0,55 g/kg/refeição) e incluindo uma refeição dentro de 2-3 h antes e após o treino. Assim suplementação de proteína pode aumentar significativamente a massacorporal magra, mas não pode aumentar significativamente a força muscular. Sendo que com a adição de exercício físico cria um grande impacto não só na massa corporal como também na força muscular. No que toca ao pós treino existem dados limitados e inconsistentes, quanto ao uso da suplementação proteica para melhorar a recuperação do desempenho do musculo após a atividade física. Conclusão: Existem dados limitados e inconsistentes que mostram que a suplementação proteica pode melhorar a recuperação do desempenho após a atividade de desportos coletivos, apesar de uma atenuação dos marcadores indiretos de dano muscular. Em relação ao pré-treino, concluímos que a suplementação proteica pode aumentar a massa muscular e o desempenho quando o estímulo do treinamento é adequado (por exemplo, frequência, volume, duração) e a ingestão alimentar é consistente com as recomendações para indivíduos fisicamente ativos. Em suma, o treino físico pode aumentar significativamente a massa corporal magra e o pico de torque.

Palavras-Chaves: Suplementação, Proteína, Massa muscular, Força muscular.

Impacto da dieta na performance dos atletas

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Resumo: A dieta é bastante importante para a melhoria da performance desportiva dos atletas. Nos últimos anos cada vez mais, este fator, tem vindo a ganhar importância ao longo da época desportiva dos mesmos. Nas provas das diversas modalidades, o seguimento de uma dieta permite alcançar o melhor rendimento em momentos decisivos. O nosso objetivo foi procurar perceber se a aplicação de vários tipos de dietas é benéfica ou prejudicial para a performance de atletas de alto rendimento. Métodos: Foirealizada uma pesquisa na base de dados PubMed a fim de analisar a eficácia das estratégias nutricionais na melhoria do desempenho e saúde do atleta. Resultados: Como resultados obtemos que o jejum intermitente e a alimentação com restrição de tempo produzem benefício à saúde; a dieta citogénica não apresenta evidencia significativa; a dieta rica em carboidratos leva à redução dos níveis de colesterol e ao aumento dos níveis de triglicéridos; a ingestão de dietas vegans e vegetarianas tem tendência a melhorar o desempenho em exercícios de resistência; os atletas com acesso a nutricionistas não estão propensos a procurar informações nutricionais por meio da media social; os níveis de escolaridade mais baixos em atletas podem influenciar a ingestão alimentar; a dieta paleolítica não tem impacto negativo em atletas; a dieta Low- Carb High-Fat afeta o bem-estar subjetivo dos atletas; a dieta Low-Carb Citogénica não evidencia perda de performance. Em suma, uma dieta que proporcione grandes mudanças na alimentação antiga do atleta afeta o rendimento do mesmo. Assim, atendendo à informação podemos aconselhar o acompanhamento profissional de um nutricionista a fim de proporcionar uma melhor ingestão dietética aliada às exigênciasde cada modalidade. A nível nutricional a presença de hidratos de carbono e a exclusão de dietas com alto teor de gordura apresenta evidência de melhoria na performance dos atletas, caso não seja desprezada a ingestão de outras fontes energéticas encontradas nas dietas vegans e veganas.

Palavras-Chave: Dieta, Atletas, Nutrição, Performance.

A importância da hidratação e da ingestão de eletrólitos em desportos de endurance

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Resumo: A influência da nutrição e do exercício físico na saúde e na qualidade de vida dos indivíduos nunca foi tão importante como nos dias de hoje. A qualidade e a quantidade de alimentos ingeridos têm efeitos positivos ou negativos, tanto para a saúde como para o rendimento desportivo de um atleta. Um atleta que pratique um desporto de endurance necessita de ter cuidado não só com a alimentação queingere durante a realização de uma prova/treino, como a sua hidratação. O objetivo do artigo foi analisara importância da hidratação e do consumo de eletrólitos em provas/treinos de endurance e quais os seus efeitos nos organismos dos atletas. A ingestão de alimentos ou de água e eletrólitos depende da temperatura; do grau de dificuldade, da intensidade e da duração prova/treino; e ainda da condição física doatleta. A hidratação tem como objetivo repor as perdas de água e eletrólitos, pois estar bem hidratado é um fator importante para um bom rendimento desportivo. A redução da ingestão de água produz efeitos negativos na capacidade de transporte de oxigénio aos músculos, uma vez que reduz o volume de circulação de sangue. Por outro lado, a ingestão excessiva de água também terá efeitos negativos. Assim, para um atleta se manter hidratado durante uma prova, deve deingerir entre 1 e 1,5 litros por hora. Numa fase de desidratação significativa, dependendo da massa corporal do indivíduo, a percentagem da variação da massa corporal vai de -3% a -5%. Os eletrólitos transmitem impulsos nervosos pelo corpoatravés de descargas elétricas, ajudando também a transportar nutrientes para as células. Para provas/treinos inferiores a 60 minutos, a ingestão de apenas água é suficiente. Todavia, em treinos superiores a 60 minutos, deve-se ingerir não só água, hidratos de carbono (para fornecer energia rápida), e eletrólitos (para aumentar o transporte de nutrientes para as células). Conclui-se que o objetivo da hidratação é evitar a desidratação excessiva, não permitindo uma perda superior a2% da massa corporal por défice de água, assim como, evitar grandes oscilações no balanço de eletrólitos, para que o rendimento desportivo não fique comprometido.

Palavras-Chave: Nutrição, Hidratação, Eletrólitos, Performance, Endurance

O Regime Vegetariano Num Atleta

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Resumo: A prática de uma alimentação saudável pressupõe que esta deva ser completa, variada e equilibrada. Existem cada vez mais atletas no topo dodesporto com uma dieta vegetariana, no entanto, são muitos os que aindadefendem que este regime é insuficiente. Assim, o objetivo deste estudo foi analisar o impacto da dieta vegetariana na performance de um atleta. Métodos: Foi realizada uma pesquisa na base de dados através das palavras-chaves pré- definidas em vários motores de busca como o *Pubmed, Web of Science e B-On* de modo a encontrarmos artigos relevantes para o estudo. Foram selecionados 19 artigos com cerca de 10 anos. Resultados: O atleta vegetariano tem ao nível da performance as mesmas capacidades dos que não são vegetarianos. As dietas vegetarianas podem diminuir o risco de doenças crónicas, degenerativas, inflamatórias e controlo do peso. Em relação à distribuição de Macronutrientes em % do valor energético total, nos adultos é recomendado: Gordura 20% - 35%;Ácidos gordos ómega-3 0,6% - 1,2%; Ácidos gordos ómega-6 5% - 10%; Hidratosde Carbono 45% - 65%; Proteína 10% - 35%. Conclusões: Após a analise dos artigos entende-se que não existe diferença na performance do atleta entre os omnívoros e vegetarianos sendo que o atleta vegetariano ao nível do sangue é mais saudável devido à proteína ser vegetal. No entanto a possibilidade de suplementação nutricional deverá ser ponderada, apenas se as necessidades nutricionais não forem atingidas através da alimentação.

Palavras-Chave: Dieta Vegetariana; Desporto; Nutrição; Atleta; Performance; Saúde.

Influência da nutrição no treino de força

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Resumo: A nutrição desempenha um papel fundamental no treino de força, pois fornece ao corpo os nutrientes necessários para a recuperação, crescimento muscular e prevenção de lesões. Além disso, a alimentação adequada é essencial para aumentar e manter a energia durante o treino, maximizando a performance e os resultados obtidos. O objetivo do nosso estudo foi entender como diferentes tipos de alimentos e nutrientes afetam o desempenho, a recuperação muscular e o ganho de massa muscular em atletas de alto rendimento e em pessoas comuns que praticam exercícios de força. Métodos: A pesquisa realizada conduziu à recolha de 8 artigos através da plataforma pubmed, na qual os principais resultados obtidos incidiram sobre recomendações acerca da quantidade e do momento certo da ingestão de proteínas, carboidratos, hidratação e suplementação de modo a maximizar os efeitos que o treino de força exerce no organismo. Resultados: De acordo com os diferentes estudos e artigos analisados, para indivíduos que praticam força as recomendações de ingestão diária de proteína compreendem valores entre 1,2 a 2,2 gramas de proteína por kg de peso corporal. A recomendação geral de ingestão de carboidratos é de 3 e 5 gramas por kg de peso corporal por dia, principalmente antes e após o treino. Em relação à hidratação, os resultados da quantidade de água recomendada são de 3 a 4 litros por dia, dependendo no nível de atividade física e do clima. Conclusões: Podemos concluir, que aingestão de proteínas, carboidratos, hidratação e suplementação são cruciais para o treino de força, pois ajudam a fornecer energia para o exercício, melhoram a recuperação e promovem o aumento da massa muscular.

Palavras-Chave: Nutrição; treino de força; performance; proteína; carboidratos;

A importância da dieta na recuperação de um atleta

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Resumo: A dieta arroga um papel importante no desporto ao garantir um aportede nutrientes essenciais para a preparação, recuperação, adaptação e otimização,por forma a potenciar os resultados e a performance/rendimento desportivos. Na recuperação de um atleta é fundamental repor as reservas que o corpo despendeu, como os minerais e os líquidos perdidos durante o treino. Também a proteína tem um papel importante pois vai ajudar na regeneração e recuperação muscular. O objetivo deste estudo foi analisar o papel desempenhado pela dieta na recuperação dos atletas pós exercício físico. Métodos: Realizamos através das palavras-chave definidas uma pesquisa em repositórios online de artigos que fossem de encontro ao objetivo do nosso trabalho. Foram selecionados 8 artigos recolhidos em diferentes motores (*Google Académico* e *Pubmed*). Resultados: É recomendado a ingestão de 0.3g/kg de proteína o mais rápido possível após o treino. Em relação aos carbohidratos a quantidade recomendada é de 1-1.2g/kg na primeira hora após o exercício ou 5-7g/kg ao longo do dia. Nos fluídos 1.0-1.5L por cada kg de massa corporal perdida. Quanto à creatina os valores são 3-5g/dia num período de 30 dias para aumentar a creatina muscular. Conclusões: A dieta desempenha um papel fundamental na recuperação pós exercício. A ingestão adequada e correta dos diferentes nutrientes potencia uma recuperação mais rápida e eficaz. Neste sentido, o conhecimento a respeito da recuperação e das várias estratégias nutricionais utilizadas com o intuito de acelerar o processo de recuperação torna-se essencial, não só para os atletas, mas também para o staff desportivo que os envolve.

Palavras-Chave: Dieta, Atleta, Recuperação, Macronutrientes, Performance

Efeito placebo vs cafeina na performance desportiva

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Resumo: A 1,3,7-trimetilxantina, popularmente conhecida como cafeína, é um antagonista competitivo dos receptores de adenosina. Essa substância é amplamente consumida no mundo e pode ser encontrada em diferentes fontes da natureza, sendo o grão de café o mais conhecido delas. A cafeína pode exercer diferentes efeitos sob o corpo humano, tais como redução do stress oxidativo e da fadiga e, principalmente, causar um efeito ergogênico. Estes efeitos têm amplo conhecimento público e forte embasamento científico, tornando a cafeína em um dos suplementos mais consumidos do mercado para benefício agudo. Entretanto, tal disseminação pode criar no público geral a ideia de que o uso da cafeína não exige protocolos e por isso, acabam usufruindo apenas de certo efeito placebo ao fazer uso indiscriminado da cafeína. O objetivo desta revisão narrativa foi esclarecer algumas limitações fisiológicas e potencialidades psicológicas da cafeína. Para construção deste trabalho foram analisados 10 artigos que variaram entre ensaios clínicos e revisões e que somados resultaram na observação de 3517 indivíduos e pelo menos 425 artigos. Como esperado, a grande maioria dos artigos comprovaram a eficácia da cafeína como substância ergogênica, mas também encontramos informações que comprovam a semelhança desta com substâncias inertes. Em conclusão, a cafeína é uma substância com efeitos ergogênicos, que melhoram o desempenho físico em exercícios aeróbicos e anaeróbicos. A dosagem recomendada varia entre 3 e 6 mg/kg de massa corporal, com doses mínimas efetivas ainda não estabelecidas. A suplementação deve ser feita cerca de 60 minutos antes do exercício. Placebos podem oferecer benefícios terapêuticos para diversas condições clínicas e desportivas, incluindo o desempenho deatletas. Bebidas desportivas com cafeína são eficazes em desportos baseados na resistência, força, individuais e de equipa. O efeito ergogênico da cafeína está associado ao bloqueio dos receptores de adenosina e ao aumento do recrutamento das unidades motoras, melhorando o desempenho no exercício. A dosagem recomendada costuma ser limitada a 3 mg/kg para evitar efeitos colaterais negativos.

Palavras-Chave: Placebo; Cafeína; Performance; Suplementação.

Importância da Nutrição nos Desportos de Combate

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Resumo: Nos desportos de combate olímpicos os atletas são divididos em categoriasde peso, na tentativa de reduzir as discrepâncias entre os atletas. Desta forma, com o passar do tempo os desportos de combate e a nutrição foram estando cada vez mais ligados de forma a criar uma maior eficiência na relação peso/força. Os atletas geralmente competem em divisões de peso inferiores ao seu peso normal do dia a dia, fazendo assim manipulações crónicas e agudas da massa corporal, em que o seu uso estratégico pode melhorar o seu sucesso competitivo. Assim, o objetivo do estudo foi analisar a estratégia usada por atletas para ganhar e perder peso de forma eficiente e deque maneira conseguimos prevenir as lesões devido à drástica perda de peso com uma dieta equilibrada. Através dos artigos analisados na plataforma Pubmed, podemos compreender que o fator chave para ganhar e perder massa corporal nestes desportos éa água ingerida e a ingestão de carboidratos, sendo que os atletas só recuperam em média 1,9kg de peso corporal durante a recuperação. Durante a recuperação observamos que a água representou 86% do consumo total, sendo que ¼ da água consumida é proveniente de bebidas ricas em carboidratos e os carboidratosrepresentaram 5,5g/kg de peso corporal, sendo que o consumo recomendado seria 8- 10g/kg de peso corporal. No entanto a discrepância entre a ingestão de nutrientes e o ganho de peso aponta para barreiras fisiológicas de retenção de líquidos. Os atletas são ainda capazes de utilizar estratégias em torno do glicogénio e reposição de eletrólitos para se prepararem para a competição. Em suma, para a perda de peso variam desde a redução da disponibilidade de glicogénio, até ao aumento da perceção de fadiga,fazem uma restrição de ingestão de energia, redução total de fluidos corporal, e a prática médica psudo-extrema/abusiva (Diuréticos), reduzindo assim a massa corporal. Para o aumento de peso e recuperação de força, o consumo de carboidratos e proteína combinado com o consumo de suplementação com evidência científica (ou seja, chá verde, beterraba, creatina ou água alcalina) e outros métodos como terapias físicas (Imersão em água fria, massagem, etc)e fisiológicas (Recuperação ativa, sono e repouso). Para a prevenção e recuperação de lesões baseia-se na ingestão de aminoácidos e proteínas, antioxidantes, creatina e ômega 3, devido aos seus papéis terapêuticos na prevenção da perda muscular eresistência anabólica, bem como na cicatrização de lesões.

Palavras-Chave: Nutrição, Desportos de Combate, Alimentação, Perda de peso, Prevenção de lesões, Recuperação e Aumento de peso.

Efeitos da sacarose e frutose na síndrome metabólica e relação com a prática de exercício físico

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Resumo: A nutrição é um dos princípios basilares para a prática de exercício físico, sendo a ciência que estuda as relações entre os alimentos e nutrientes ingeridos pelo ser humano, facilitando a avaliação do estado de saúde e doença. Para uma melhor performance desportiva, deve-se ter em atenção os alimentos quese consomem, sendo que estes variam nas diferentes atividades desportivas. Este estudo tem como objetivo analisar dados já recolhidos e fazer um estudo-revisão de vários artigos que incidem na ingestão da sacarose e frutose e osseus efeitos, estudar o impacto e os efeitos da ingestão combinada da frutose e sacarose com a glicose e as respectivas taxas de oxidação de carboidratos exógenos, avaliar as evidências epidemiológicas, fisiopatológicas e clínicas sobre a associação entre o consumo de frutose e a adição de NAFLD (Non-Alcoholic fatty liver disease) e diabetes tipo 2, e por fim a sua influência na prática de exercício físico, avaliando os impactos positivos e/ou negativos do seu consumo na saúde da população. Os estudos evidenciaram que o consumo de frutose isolada causa um desconforto intestinal nos atletas; apesar do aumento da oxidação exógena para valores acima de 1,2g/min até 1,7g/min após o consumo de glicose com frutose/sacarose, esta não faz acelerar a reposição de glicogénio muscular, no entanto, acelera as taxas de repleção de glicogénio no fígado (<1,2g/kg/h), principalmente na recuperação pós-exercício físico; o aparecimento de várias doenças como a diabetes tipo 2, pedras nos rins e NAFLD pode estar relacionado com a alta ingestão de frutose na alimentação; a co-ingestão de glicose e de sacarose/frutose pode diminuir o desconforto intestinal e aumentar a capacidade de oxidação exógena dos carboidratos. Ou seja, é necessário equilibrar a ingestão de carboidratos e evitar o consumo excessivo de frutose, especialmente em atletas. Num futuro próximo, será necessário fazer mais estudos sobre a sacarose com incidência na recuperação dos atletas.

Palavras chave: “glicose”, “frutose”, “sacarose”, “performance”, “atletas”

Impacto do Stress na Pré-Competição no Comportamento Alimentar

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Resumo: A performance desportiva resulta do impacto do treino, nutrição e repouso a que o atleta está sujeito no seu dia-a-dia. Os hábitos nutricionais afetama recuperação entre treinos e influênciam os efeitos deste. O que também afeta os hábitos nutricionais e consequentemente a má recuperação é o stress, se estamos stressados vamos ter uma qualidade de sono pior, vamos ter uma alimentação menos equilibrada, como comer em excesso ou alimentos com alto teor de açúcare gorduras ou então o contrário, que é não comer e isso leva a não ter energia. Ostress pode influenciar a tomada de decisão em humanos de muitas perspectivas cognitivas, enquanto o mecanismo neurobiológico subjacente permanece incompreendido. O objetivo do nosso estudo foi analisar a influência que o stresspode ter no comportamento dos atletas no que toca a alimentação antes da competição. Como referi anteriormente uma boa alimentção é fundamental parao redimento do atleta e por vezes o stress vai causar uma mudança nos hábitos alimentares dos mesmos, o que vai ser prejudicial para a perfomance. Existem vários estudos que comprovam as mudanças de hábitos alimentares devido ao stress, num destes estudos foram colocados ratos em um recipiente de plástico por duas horas antes dos testes comportamentais. Os ratos stressados apresentavam alguns comportamentos como ansiedade, e elevação de costicosterona sérica (CORT) e epinefrina (EPI), de seguida foram colocados numcampo aberto comida padrão e comida doce e verificou-se que os ratos preferiamas comidas doces. Em outro estudo defende-se que o treino em ambiente competitivo e o esforço prolongado pode estar associado a inúmeras alterações hormonais e bioquímicas, que têm efeitos prejudiciais na função imunológica. Esse estudo mostra que uma má nutrição provocada pelo stress vai afetar a performance do atleta devido ás alterações hormonais, que por fim vai serprejudicial para a prova de devido ao esforço pesado da imunocompetência. Em suma, podemos concluir que o stress altera o nosso comportamento alimentar talcomo os nossos hábitos diários.

Palavras Chave: Stress, Alimentação, Pré-Competição, Performance.

O efeito da suplementação aguda de alta dosagem de beta alanina na performance de corredores amadores.

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Resumo: A beta alanina vem sendo apontada como ergogênico capaz de otimizar a performance esportiva, principalmente em atividade de alta intensidade como as corridas, isso devido a sua capacidade tampão, mas ainda não se sabe ao certo em relação a suplementação de forma aguda e com uma alta dosagem. objetivo do estudo foi analisar se a suplementação aguda de alta dosagem de beta alanina melhora o rendimento de corredores amadores e suas respostas relacionadas aos seus sintomas. A pesquisa foi composta por 14 indivíduos (idades 24,8 ± 3,8 anos; estatura de 171,1 ± 5,9 cm; %G 6,8 ± 4,1) com no mínimo 2 anos de prática do município de Lavras-MG. Primeiramente foram divididos entre grupos PLA ou BA e se familiarizarem com os procedimentos a serem adotados, no segundo e terceiro dia os participantes chegaram com 1hr de antecedência ao teste principal, devido a ingestão de 30mg·kg-1 de suplemento ou placebo, anotando o nível de parestesia a cada 10 min, após 1hr foram submetido ao Teste de Pista Universidade de Montreal. Coletando: distância total, frequência cardíaca a cada 2 min. Utilizou-se estatística descritiva, Teste T para duas amostras não dependentes para igualdade de médias, com significância $p<0,05$, no software SPSS® versão 25.0. Ao analisar os resultados obtidos, não reportou nenhuma diferença significativa. Mas é possível notar um incremento de 40m na distância percorrida após a ingestão com BA (BA: 4151,43m ± 655,99m; PL: 4111,43m ± 784,02m), para fc nota-se uma diminuição para grupo BA,(BA: 188,36 ± 13,71; PL:193,57 ± 11,50), já os efeitos colaterais, 4 dos 14 relataram sintomas de parestesia. Conclui-se que os efeitos colaterais causados por meio da parestesia, não foram observados em todos os participantes e que a suplementação aguda não apresentou resultados significativos no desempenho destes atletas.

Palavras-Chave: Beta Alanina, Parestesia, Suplementação, Corredores, Performance

DETERMINACIÓN ANTROPOMÉTRICA DEL SOMATOTIPO, PERFIL GRASO Y DEL GASTO ENERGETICO BASAL DE ATLETAS DE CROSSFIT PROFESIONALES

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Resumo : El CrossFit es un programa de acondicionamiento y entrenamiento que ha ido ganando reconocimiento e interés entre la población físicamente activa. Se basa en un conjunto de ejercicios complejos e incluye correr, levantamiento de pesas, gimnasia deportiva y movimientos balísticos. A nivel competitivo se distinguen 3 categorías: escalado, intermedio y Rx, siendo esta última donde compiten los atletas profesionales. Los objetivos del estudio fueron establecer el somatotipo de referencia del atleta de CrossFit profesional, junto a valores de masa grasa y valorar el gasto energético basal mediante análisis de gases de atletas profesionales de CrossFit. En el presente estudio participaron 13 atletas profesionales, 7 mujeres y 6 hombres. Las medidas antropométricas fueron recogidas siguiendo el protocolo de la *"La Sociedad Internacional para el Avance de Cineantropometría"* (ISAK). La masa grasa (FM) se calculó utilizando la ecuación Withers. Los componentes del somatotipo fueron estimados mediante la ecuación Carter y Heath. La medición del metabolismo basal se realizó mediante calorimetría indirecta con FitMate Pro (Cosmed). Los atletas presentaron un somatotipo en el que predominaba la mesomorfia (5,90±1,68) frente a la endomorfia (1,81±0,58) y la ectomorfia (1,45±0,39), al igual que las atletas presentan un somatotipo en el que predominaba la mesomorfia (4,79±0,86) frente a la endomorfia (2,03±0,68), y la ectomorfia (1,89 ± 0,94). También se observó que las mujeres presentaban un perfil graso (9,0±2,1%) similar a los hombres (8,2±2,2%). En los hombres, la altura media se corresponde a 177,0±7,1 cm, y un peso medio de 84,2±2,8 kg; mientras que en las mujeres la altura media se corresponde a 163,7±6,2 cm y el peso a 61,6±5,5 kg. Los valores del metabolismo basal en reposo fueron superiores en hombres (2704±412 kcal/día) que en mujeres (2082±401 kcal/día).

Palavras-Chave: CrossFit, antropometría, somatotipo, masa grasa, composición corporal.

Valores cineantropométricos y somatotipo en escaladores de competición

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Resumo: La escalada es un deporte en crecimiento que experimenta una rápida expansión en todo el mundo, cada día más escaladores se inician en la práctica de este y participan en competiciones de distintos ámbitos territoriales. Así pues, surge un especial interés en conocer qué valores antropométricos determinan el rendimiento en competición. El total de la muestra fue de 18 deportistas competidores a nivel autonómico, de los cuales 11 fueron varones (22,5±2,2 años) y 8 mujeres (21,8±1,6 años). Se realizaron mediciones antropométricas siguiendo las directrices de la ISAK para poder comparar los valores con los resultados obtenidos en la competición interuniversitaria, la cual incluía 20 bloques de distinta dificultad y 3 horas de tiempo para realizar todos los intentos necesarios. En el grupo de mujeres se observó que a mayor sumatorio de 6 pliegues, valor medio de 66,3±12,2 mm, se dieron peores posiciones finales ($p<0,05$), pudiendo ser este un valor determinante en el rendimiento de las deportistas. Además, se tomaron valores de peso (54,5±4,6 kg), envergadura (165,6±5,4 cm) y estatura (163,7±4,2 cm), mostrando que las escaladoras con mayor envergadura relativa fueron las que obtuvieron mejores resultados en las pruebas. No hubo relación significativa entre el índice adiposo-muscular (IAM) (0,8±0,1) y el rendimiento. La media del sumatorio de 6 pliegues en varones fue de 57,0±16,3 mm, no encontrándose una relación con el rendimiento en la competición. Los valores de peso fueron 72,2±9,1 kg, de envergadura 181,8±10,1 cm y de estatura 177,4±7,1 cm. Al igual que el grupo de mujeres, se obtuvieron mejores resultados a mayor envergadura relativa. El IAM fue de 0,5±0,1, lo que se considera un valor muy bueno, pero sin relación significativa con el rendimiento de la prueba. En cuanto al somatotipo, tanto el grupo de varones como el de mujeres mostraron un perfil mesomorfo balanceado (2,3-4,5-2,7 y 2,6-3,7-3,1 respectivamente).

Palavras-Chave: Escalada; competición; somatotipo; antropometria; envergadura

Efeito da Suplementação com Diferentes Doses de Cafeína na Concentração de Glicose Após um Exercício Resistido

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Resumo: A suplementação de cafeína pode promover aumento a eficiência neuromuscular atraves da modulação de respostas fisiológicas e metabólicas. Dentre as alterações metabólicas, a ingestão aguda da cafeína parece favorecer um aumento da tensão metabólica, devido ao metabolismo da glicose ser influenciado proporcionando um aumento na sua concentração sérica (SHEARER; GRAHAM, 2014). Esses efeitos ja foram observados em exercícios aeróbicos, porém pouco ainda se sabe sobre sua ação no treinamento resistido (TR). Com isso, objetivou-se avaliar a influência de diferentes dosagens de cafeína na concentração de glicose sanguínea após a realização de um teste de resistência muscular. Onze homens (25,7 ± 5,9 anos; 71,1 ± 11,0 Kg; 170,72 ± 6,6 cm) foram suplementados com cafeína baixa (CB = 210 mg) e alta (CA = 420 mg), ou placebo baixo (PB = 230 mg) e alto (PA = 460 mg) sessenta minutos antes dos testes. Foram coletados dados antropométricos e o teste de 1RM para o exercício de supino reto (SR) em um primeiro momento. A partir da segunda coleta, a glicose foi avaliada pré e pós-teste de resistência muscular no SR (80% RM) até a falha. O tempo de *washout* da cafeína foi respeitado. Foi realizado uma análise descritiva dos dados e um teste T pareado com nível de significância de $p < 0,05$. A glicose diminuiu significativamente após o teste nos momentos baseline (96,00 ± 14,91 VS 84,09 ± 11,84 mg/dl; $p = 0,04$); PB (99,27 ± 18,68 VS 88,36 ± 11,60 mg/dl; $p = 0,04$) e PA (94,00 ± 13,02 VS 82,73 ± 14,58 mg/dl; $p = 0,01$), nas condições CA e CB não houve diferença significative após o teste ($p > 0,05$). Dessa forma, concluiu-se que a suplementação aguda de cafeína foi capaz de promover um aumento da tensão metabólica, proporcionado por uma economia glicêmica.

Palavras-Chave: Treinamento Resistido. Cafeína. Glicemia. Neuromuscular. Resposta Metabólica.

Suplementação de nitrato inorgânico não altera o segundo ponto de limiar de transição metabólica em corredores amadores

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Resumo: Resumo: Observamos o comportamento dos segundo limiar de transição metabólica através do ponto de deflexão da frequência cardíaca – PDFC, e seu respectivo percentual em 13 homens corredores de fundo de uma equipe de corrida de rua da cidade de Varginha – Minas Gerais submetidos a um teste progressivo ergométrico (TPE) sob a suplementação aguda de Nitrato (NO3-). Administramos 70ml de suco de beterraba concentrado rico em NO3- (~6,4mmol de NO3- - 400mg - Beet IT; James White Drinks Ltd, Ipswich, UK) - MN e placebo - MP empobrecido em NO3- (0,04 mmol de NO3- >0,8g/L - Beet IT; James White Drinks Ltd, Ipswich, UK) 2 horas antes dos testes com base nas recomendações do International Olympic Committee– CO. O protocolo do TPE foi o proposto por Heck et al., (1985) ao qual consistiu em um aquecimento de 5 minutos a uma velocidade constante de 4km/h sem inclinação. O teste iniciou-se imediatamente ao fim do aquecimento a uma velocidade de 8Km/h e aumentos de 1,0Km.h a cada 2 minutos, com inclinação constante de 1%. Como resultado detectamos o ponto de deflexão da frequência cardíaca - PDFC de MP e MN ocorreram respectivamente em 151,46 ± 6,09 Vs. 150,23 ± 6,23 sem diferença estatística (p= 0,508; d=0,038). O %FCMÁX no PDFC em MP e MN ocorreram respectivamente em 82,91 ± 3,75% Vs. 82,81 ± 3,80% (p=0,067; d= 0,01) sem diferenças estatísticas. Concluímos que o nitrato não foi capaz de modificar o segundo limiar de transição metabólica. Todavia, observamos um ligeira tendência a diminuição do esforço cardíaco em MN

Palavras-Chave: Beterraba; Ingestão; Metabolismo; Captação

Controle de Carga em Corredores Amadores de Fundo sob Suplementação Aguda de Nitrato em um Teste de Corrida

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Resumo: Resumo: Observamos o comportamento dos parâmetros de Frequência Cardíaca Máxima – FCMÁX, Percepção Subjetiva do Esforço – PSE e Volume Máximo de Oxigênio - VO2MÁX em 13 homens corredores de fundo de uma equipe de corrida de rua da cidade de Varginha – Minas Gerais submetidos a um teste progressivo ergométrico (TPE) sob a suplementação aguda de Nitrato (NO3-). Administramos 70ml de suco de beterraba concentrado rico em NO3- (~6,4mmol de NO3- - 400mg - Beet IT; James White Drinks Ltd, Ipswich, UK) e placebo empobrecido em NO3- (0,04 mmol de NO3- >0,8g/L - Beet IT; James White Drinks Ltd, Ipswich, UK) 2 horas antes dos testes com base nas recomendações do International Olympic Committee– CO. O protocolo do TPE foi o proposto por Heck et al., (1985) ao qual consistiu em um aquecimento de 5 minutos a uma velocidade constante de 4km/h sem inclinação. O teste iniciou-se imediatamente ao fim do aquecimento a uma velocidade de 8Km/h e aumentos de 1,0Km.h a cada 2 minutos, com inclinação constante de 1%. Foi utilizada a equação para estimar o volume máximo de oxigénio, a saber; VO2MÁX: (0,2*S) + (0,9*S*G) + 3,5 ml.kg.min-1. A frequência cardíaca foi coletada ao final de cada estágio,. Para que o teste fosse considerado máximo, o sujeito deveria atingir pelo menos 90% da FCMÁX predita pela fórmula FCMÁX= 208- (0,7 x idade). Durante o teste progressivo foi realizada PSE adotando protocolo de Borg (2000) e anotado o valor a cada 2 minutos até o final do teste. Utilizamos comparação das médias, desvio padrão e análise do tamanho do efeito da amostra pelo teste Cohen (d). Não observamos diferenças estatísticas nos parâmetros de FCMÁX (p=0,573; d=0,013); PSE (p=1,108; d=0,049) e VO2MÁX (p=0,102; d=0,107). Diante a tal, concluímos que o nitrato não interfere nos parâmetros de controle de carga.

Palavras-Chave: Beterraba; Ingestão; Metabolismo; Captação

Concordancia y diferencias entre las fórmulas de estimación de la grasa mediante antropometría en una población femenina físicamente activa.

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Resumen: La importancia de estimar con precisión la masa grasa en diversos ámbitos relacionados con la salud y el deporte ha llevado al desarrollo de numerosos métodos y fórmulas de estimación (1). Considerando que la medición directa de la composición corporal no es factible, el objetivo de este estudio fue comparar el grado de concordancia y las diferencias en los resultados obtenidos por distintas fórmulas de estimación de la masa grasa mediante antropometría (2,3). Se realizaron evaluaciones antropométricas en 54 mujeres físicamente activas siguiendo el protocolo de la Sociedad Internacional para el Avance de la Cinantropometría (ISAK), incluyendo los pliegues cutáneos del tríceps, bíceps, subescapular, cresta ilíaca, supraespinal, muslo y pierna; se calculó el porcentaje de masa grasa utilizando 12 fórmulas diferentes validadas en población femenina (Durnin-Womersley, Yuhasz, Faulkner, Carter, Peterson, Katch-McArdle, Sloan,Wilmore, Evans, Lean, Thorland, and Kerr) y los sumatorios de 6 y 8 pliegues cutáneos. Posteriormente, se analizaron las diferencias entre los resultados obtenidos con las distintas fórmulas de estimación y el nivel de concordancia entre ellos. Los resultados mostraron diferencias significativas entre las fórmulas (15,33±2,94% a 28,79±3,30%; $p<0,001$-$0,004$). Las fórmulas de Carter y Yuhasz mostraron una concordancia moderada entre sí (CCC=0,974), mientras que las demás fórmulas mostraron una baja concordancia (CCC<0,372). Ninguna de las fórmulas obtuvo resultados similares a la fórmula de Kerr ($p>0,05$) (3). Por lo tanto, el estudio concluye que las fórmulas utilizadas para estimar la masa grasa en antropometría para la población femenina presentan resultados significativamente diferentes entre sí y no concordantes, lo que las hace que no se puedan comparar los resultados obtenidos con distintas fórmulas. Como aplicación práctica, el empleo de los sumatorios de pliegues podría ser una alternativa para valorar la evolución del tejido adiposo sin necesidad de la aplicación de fórmulas.

Palabras clave: tejido adiposo; grasa corporal; mujeres; cineantropometría; pliegues cutáneos.

Análise cinemática do apoio facial invertido

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Resumo: Background: Apoio facial invertido é um dos principais elementos gímnicos. O executante deverealizar um grande afundo à frente, tronco no prolongamento da perna de trás, braços estendidos e palmasdas mãos voltadas para o solo. Com o olhar dirigido para as mãos colocando-as a frente do corpo realizandosimultaneamente um longo impulso contínuo com a perna da frente. As mãos apoiam no chão à largura dosombros e com os dedos bem afastados, terminando com o alinhamento dos segmentos corporais em extensão máxima. Deste modo pretendemos realizar a análise cinemática do apoio facial invertido de modoa compreender quais as diferenças na execução entre um ginasta em formação e uma pessoa sem qualquerhábito de treino para esse movimento. **Métodos:** comparando um grupo de 8 ginastas em formação com 8colegas nossos da licenciatura (Grupo de ginastas: 15,88±2,98 anos; 54,50±12 kg; 1,64±0,12 m) (Grupo denão praticantes: 20,88±1,69 anos; 66,06±6,88 kg; 1,77±0,06 m). Resultados: **Ginastas -** (articulação gleno-umeral) 1º Fase: 129,80±31,29 º ; 2º Fase: 132,10±11,96 º; 3º Fase 145,90±8,00 º ; 4º Fase 159.60±10,93 º | (articulação femoro-tibial) 1ºFase 170,30±5,88 º ; 2º Fase 136,80±13,58 º ; 3º Fase 150,00±18,02 º ; 4º Fase 172,45±7,63 º **Não Ginastas -** (articulação gleno-umeral) 1º Fase 98,30±29,19 º ; 2º Fase 117,9±6,94º ; 3º Fase 122,50±3,10 º ; 4º Fase 142,00±7,63 º | (articulação femoro-tibial) 1º Fase 149,50±14,33 º ; 2º Fase 120,90±5,65 º ; 3º Fase 125,70±13,95 º ; 4º Fase 167,40±7,77 º **Conclusões:** Evidenciamos que para cada fase do movimento os ginastas conseguem amplitudes maiores que os colegas não praticantes, e isso aproxima-os de uma execução muito melhor a nível técnico.

Palavras-Chave: Biomecânica, Apoio Facial Invertido, Cinemática, Movimento

Aplicação do remate no andebol entre atleta amador e profissional

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Resumo: O remate de andebol representa o gesto técnico no qual todos os atletas de andebol utilizam para marcar golo, sendo por vezes é entendido como um mero remate (conjunto de movimentos) o que não é verdade. O remate de andebol engloba um conjunto de técnicas e adaptações musculares necessárias para a otimização e eficiência do movimento. Assim, pretendemos analisar o gesto técnico do remate no andebol entreprofissionais e amadores. Métodos: 8 atletas amadores (GA: 20 ± 2.57 anos; 172.2± 8.27cm; 62.2 ± 11.78kg) e 1 atleta profissional realizaram um remate sem impulsão na linha de 7 metros. Resultados: Na fase inicial do remate o atleta profissional registou 175º de amplitude e os restantes atletas registaram 176 ± 3.40 graus, na fase de remate oatleta profissional registou uma amplitude de 125º enquanto os restantes atletas em estudo registaram 160 ± 9.25 graus. Por último registou-se a velocidade da bola a partir do momento em que sai da mão do atleta e os resultados para o atleta profissional foi de 12 m/s enquanto para o grupo experimental foi de 12.2 ± 2.65 m/s. Conclusões: Não ocorreram variações de velocidade consideráveis entre o atleta profissional e GA aquando o remate.

Palavras-Chave: Biomecânica, Cinemática, Remate no andebol, Movimento

Partida de blocos no atletismo entre atletas amadores e atletasnacionais

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Resumo: A partida de blocos é fundamental para performance no atletismo. Assim, pretendemos analisar o movimento da partida de blocos entre atletas sem experiência e atletas com experiência procurando verificar se a técnica de execução tem influência no resultado. Métodos: Analisámos 8 atletas, sendo 4 amadores (GA: 26.25± 15.48 anos; 63.13± 6.64kg) e 4 com experiência nacional (GN: 19.75± 2.22 anos; 166,75±3.50cm; 62.56±6.38 kg; 167±10.40cm). Ambos os grupos realizaram uma reta de 5 metros com e sem blocos e foram analisados dados como a velocidade e aceleração. O GN apresentouuma velocidade média de 2.11±0.18m/s e o GA uma média de 1.77±0.39m/s. A aceleração média do GN foi de 2.24±1.02m/s e do GA foi de 3.19±1.07m/s. Conclusões: após análise cinemática dos atletas observamos que em 5 metros a eficiência da técnica não cria uma grande discrepância nos resultados.

Palavras-Chave: Partida de Blocos, Cinemática, Análise de Dados, Velocidade, Movimento

Impacto do impulso na performance do lançamento livre de atletas amadores

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Resumo: O lançamento livre no basquetebol representa uma das técnicas que permite às equipas acumularem pontos procurando a sua vitória. Deste modo pretendemos efectuar uma análise cinemática do lançamento livre sem e com impulsão por forma a analisar as diferenças entre as amplitudes articulares dos nossos participantes. Métodos: 7 atletas amadores (22.8±5.9 anos; 66±7.6 kg; 1.73±0.08 cm) e 1 atleta profissional realizaramum 1 lançamento ao cesto com impulso e outro sem impulso. Resultados: No lançamento livre sem impulso, na sua fase de posicionamento até à fase lançamento verificou-se umavariação da articulação do joelho de 125.7±19.34 a 169.2±8.82 e na articulação docotovelo registou-se de 85.5±11.1 a 168±8.61. No entanto no lançamento livre comimpulsão verificou-se que a variação angular da articulação do joelho foi de 112.4±12.15a 167.3±6.7 e na articulação do cotovelo foi de 86.1±10.5 a 164.5±10.6. Conclusões:Após a análise cinemática do grupo de exercício, é possível verificar que a diferença angular não dispersa significativamente entre o lançamento com impulsão e sem impulsão.

Palavras-Chave: Biomecânica, Lançamento Livre, impulso, basquetebol

Análise Cinemática do Remate no futebol a 11 e a 22 metros da baliza

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Resumo: O remate a 11 metros (penálti) é utilizado como forma de desempatar ao jogo caso este seja para uma fase de eliminatória ou caso seja assinalada uma falta dentro da grande área.O objetivo deste remate é, como qualquer outro remate, é colocar a bola dentro da baliza adversária. O remate a 22 metros (livre) é utilizado quando existe uma falta fora da área e isso irá dar origem a um remate com a bola parada e que apenas terá a oposição de uma barreira daequipa adversária. Pretendemos fazer uma análise cinemática, através de filmagens do movimento de vários atletas amadores, com o objetivo de comparar os ângulos da articulação do joelho e as velocidades máximas da bola após o contacto da mesma no remate no pênalti e no remate no livre. Métodos: 8 atletas amadores (Media de idades: 24,12 anos; Media das alturas: 1,76m; Media dos pesos: 71,12 kg) realizaram um remate a 11 metros da baliza e outro a 22 metros da baliza. Resultados: A média dos ângulos da articulação do joelho na perna de remate no penálti foram (Fase preparatória: 120,24 graus; Fase de contacto: 144,15 graus; Fasepós-contacto: 144,3 graus), A média dos ângulos da articulação do joelho na perna de remate no livre foram (Fase preparatória: 69,91 graus; Fase de contacto: 166,6 graus; Fase pós-contacto:160,13 graus). A média da velocidade máxima da bola no penálti foi 40,14 m/s e no livre 72,82m/s. Conclusões: Após a análise cinemática concluímos que o remate no penálti os ângulossão inferiores aos do livre excetuando o da fase preparatória, podemos também concluir que avelocidade máxima atingida pela bola no remate a 22 metros é muito superior à do remate de 11 metros. Os ângulos e as velocidades sofrem poucas alterações de atleta para atleta, o que mostra que o movimento é efetuado de forma semelhante pelos mesmos.

Palavras-Chave: Biomecânica, Remate, Cinemática, Movimento, Treino de Futebol.

Análise cinemática do lançamento na passada no basquetebol \entre atletas experientes e amadores

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Resumo: Background: O lançamento na passada é o que confere mais probabilidade de acertar o lançamento, pois este permite que a bola saia da posse do jogador quando este se encontra o mais próximo possível do cesto. O objetivo deste estudo foi analisaro efeito da experiencia na execução do lançamento na passada em atletas com experiência na prática da modalidade e atletas que não praticaram basquetebol. Métodos: Seis atletas experientes (20.5±1.97 anos; 76.67±15.06 kg; 185.5±6.66 cm) e seis atletas amadores (20.17±0.98 anos; 72.33±8.89 kg; 180.5±5.43 cm) realizaram um lançamento na passada. Resultados: Nos atletas amadores registou-se na articulação dojoelho 146.35±11.79 graus no momento da primeira passada, 150.2±9.58 graus no momento da segunda passada, 175.7±5.47 graus no momento da impulsão e na articulação do cotovelo 153±9.78 graus no momento do lançamento. Nos atletas experientes registou-se na articulação do joelho 152.37±6.20 graus no momento da primeira passada, 135.63±4.49 graus no momento da segunda passada, 173.48±4.90 graus no momento da impulsão e na articulação do cotovelo 164.90±5.64 graus no momento do lançamento. Conclusões: Após a análise cinemática do lançamento na passada no basquetebol entre atletas experientes e amadores, observamos que houve alterações significativas no momento da segunda passada e no momento do lançamento da bola ao cesto, ou seja, estes dois momentos levam a uma maior eficiência no movimento.

Palavras-Chave: Biomecânica; Basquetebol; Lançamento na passada; Cinemática;

Análise cinemática do Back Squat Smith Machine a ângulos de 45graus e 90 graus face á articulação do joelho.

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Resumo: Background: Agachar é um movimento natural dos seres humanos. A posição baixa é a postura que a natureza entende que devemos ficar para estar sentado, e ao erguer-se (sair da posição sentada) é o método biomecânico programado para levantarmos, sendo também o agachamento um gesto técnico também utilizado paraa melhoria da performance desportiva. Deste modo pretendemos análisar a nivelcinemático as diferenças de quando o agachamento é feito a 45 graus e 90 graus, num grupo de estudantes da Licenciatura em Desporto, de forma a comparar a velocidade de execução, o ângulo da articulação do quadril e o ângulo da articulação do tornozelo,tendo em conta a fase ascendente e descendente do movimento. Métodos: 6 praticantes de desporto (grupo de exercício: 21 ± 1,77 anos, 66 ± 8,04 kg, 1,74 ± 0,08 m) realizaram uma repetição do Back Squat Smith Machine a 45 graus e uma repetiçãoa 90 graus. Resultados: A fase ascendente e descendente do Back Squat a 90 graus apresentou na velocidade de execução uma variação de : fase ascendente: 0,83 ± 0,11 seg; fase descendente: 1.12 ± 0,10 seg; na articulção do anca apresentou uma variação de 93,2 ± 8,22 graus e na articulação do tornozelo uma variação de 91,8 ± 6,88 graus. Afase ascendente e descendente do Back Squat a 45 graus apresentou na velocidade de execução uma variação de 1,32 ± 0,25 seg e 2,05 ± 0,34 seg na fase ascendente e descendente, respectivamente. Conclusões: A capacidade angular das articulações da anca e do tornozelo são fundamentais para uma correta execução do gesto técnico a 90 graus e 45 graus. Quanto maior for a flexibilidade nestas articulações maior será a capacidade angular para realizar o Back Squat Smith Machine a 45 graus.

Palavras-Chave: Biomecânica; Back squat; treino de força.

Análise cinemática do serviço do voleibol comimpulsão e sem impulsão

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Resumo: Background: O serviço de voleibol, consiste num jogador iniciar o jogo propriamente dito, lançando a bola ao ar e, em seguida, acertar com a mão na bola, emdireção ao campo adversário, tentando fazer com que a bola passe por cima da rede e caía no campo adversário. O serviço é considerado uma das técnicas mais importantes no voleibol, pois pode ter um impacto significativo no desempenho da equipa durante a partida. Assim, pretendemos analisar uma análise cinemática dos membros superiores (MS) e membros inferiores (MI) tanto no serviço com impulsão como no serviço sem impulsão. Métodos: 6 atletas inexperientes (grupo de exercício: 19±1.26 anos; 74.50±8.38 kg; 178.83±0.085 cm) e 1 atleta experiente (19 anos; 62.5 kg; 173 cm) realizaram 1 serviço sem impulsão e 1 serviço com impulsão. Resultados: No serviço sem impulsão na fase preparatória os atletas inexperientes apresentaram uma média angular na articulação do joelho de 154.75±19.78 graus, já o atleta experiente apresentou o seguinte valor 157.7 graus. Na subfase, ou seja, o movimento complementar e mais concretamente na articulação do cotovelo, os atletas inexperientes apresentaram valores de 128.98±20.92 graus, já o atleta experienteapresentou o valor de 81.9 graus. Na Fase principal e no angulo da articulação do cotovelo quando entra em contacto com a bola, os atletas inexperientes apresentaram valores de 142.00±17.66 graus e o atleta experiente apresentou o valor de 122.1 graus. Já a velocidade da bola no serviço de atletas inexperientes foi de 12.41±2.53 m/s e a velocidade da bola no serviço pelo atleta experiente foi de 14.87 m/s. A velocidade da bola no serviço com impulsão onde os atletas inexperientes apresentaram valores de 12.94±1.68 m/s e em contrapartida o atleta experiente apresentou o valor de 14.95 m/s. Conclusões: O serviço sem impulsão nos atletas inexperientes apresentou uma maior amplitude angular, porém a bola apresentou uma velocidade maior, nos atletas inexperientes no serviço com impulsão.

Palavras-Chave: serviço de voleibol; cinemática; biomecanica

Análise cinemática do passe longo no futebol comparado ao remate

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Resumo: Background: O passe longo e o remate são dois gestos técnicos no futebolcom uma importância extrema, uma boa execução dos mesmos pode definir o resultado de um jogo. Deste modo pretendemos realizar a análise cinemática do passe longo e do remate de forma a que consigamos os comparar num grupo de atletas amadores deforma a perceber as diferenças de execução entre os mesmos nas 3 fases de cada gesto técnico. Métodos: oito atletas amadores (grupo de exercício: altura 175.9±4.65 cm; peso 69.3±4,51 Kg; idade 20.7±1.58 anos) realizaram passe longo e remate. Resultados: passelongo 124.34±29.15 graus; remate 129.96±45.95 graus. Conclusões: No passe longo os resultados demonstram um desvio padrão inferior ao remate, o que significa que a técnica de remate diferenciou mais do que a de passe entre os atletas.

Palavras Chave: Biomecânica; Cinemática; Futebol; Passe Longo; Remate.

Análise cinemática do ponta pé lateral no karaté

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Resumo: Background: O pontapé lateral do karaté (mawashi geri – "mauachi guéri") consiste num pontapé circular realizado com a perna. Esta é a técnica básica de pernas que é ensinada e transmitida aos principiantes porque confere as bases necessárias para que o atleta possa, mais tarde, aprender outros pontapés mais avançados. É necessário desenvolver a força, o equilíbrio e a flexibilidade, de forma a aplicar a dita força no pontapé. Deste modo decidimos realizar uma análise comparativa entre atletas federados no que toca à execução deste ponta pé e entre amadores que nunca realizaram este gesto técnico ou que tiveram pouca experiência na execução deste. Métodos: Oito atletas com experiência em realizar o pontapé lateral (grupo de exercício: 18.4 ± 0.7 anos; 61 ± 5.2Kg; 1.71m ± 0.1m) e oito atletas sem experiencia (grupo de exercício: 18.75± 1.1 anos; 59.4± 5.4Kg; 1.74± 0.1m) realizaram o pontapé lateral. Resultados: A fase de preparação para o pontapé, dos oito atletas experientes, apresentou, na perna de ataque um ângulo de 164.3± 5.3°, na fase de impulsão e rotação, a perna de ataque apresentou um ângulo de 90.8±10.5°, por fim na fase de extensão/final a perna deataque apresenta um angulo de 178.4± 2.3°. Para os oito atletas sem experiência os resultados foram diferentes: 152,3± 11,4° na fase de preparação, 56.9± 21.8°nas fasesde impulsão e rotação, e 172.8±6,2° na fase de extensão/final. Por fim, os atletas experientes apresentaram uma altura do pé em relação ao chão de 1.39± 0.1m e os atletas inexperientes apresentaram uma altura do pé em relação ao chão de 1.29±0.1m. Conclusão: Após a análise dos ângulos que a perna de ataque forma e a altura a que o péfica do chão, chegámos à conclusão que houve alterações claras no gesto técnico do pontapé tendo em conta a experiência de uns contra a inexperiência de outros.

Palavras-Chave: cinemática; biomecânica; mawashi geri

Análise cinemática das técnicas Convencional e Sumo no Deadlift

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Resumo: Background: Deadlift é o movimento para o levantamento de carga do chão mais seguro e correto. Este carece de ação de variados grupos musculares, principalmente nos membros inferiores e zona lombar. Está integrado no treino de milhões de atletas e as suas técnicas mais utilizadas são alvo de grande controvérsia. Com a análise cinemática de ambas as técnicas (convencional e sumo) pretendemos inferir sobre como estas influenciam a ação muscular no deadlift e deste modo adaptar a técnica utilizada consoante o objetivo do treino. Métodos: 10 atletas amadores (grupo de exercício: 1. 74 ± 0.08m; 73.8 ±14.4 kg) realizaram uma repetição de deadlift convencional seguida de uma repetição de deadlift sumo com a mesma carga. Resultados: A fase inicial e final do movimento ascendente do convencional apresentou em média na articulação do joelho uma variação de 78.2 ± 17.32° e na coxofemoral de 124.2 ± 8.60°, uma velocidade de 0.53±0.15 m/s e uma amplitude de 0. 74 ± 0.05 m ponto no deadlift sumo notou-se em média na articulação do joelho uma variação de 79.5 ± 16.74° e na coxofemural de 115.8 ± 11.56°, uma velocidade de 0.48 ± 0.11 m/s e uma amplitude de 0.70 ± 0.04 m. Conclusões: Não existe qualquer tipo de alteração a nível do joelho mas devido à menor variação angular na coxofemural e no valor da amplitude o sumo deadlift exige menos trabalho lombar. As técnicas são muito similares sendo as diferenças negligiveis no nível amador.

Palavras-chave: cinemática; Biomecânica; Deadlift; Treino de força; Movimento

Análise cinemática do remate com e sem aceleração

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Resumo: O remate é um gesto técnico de grande complexidade motora que necessita de estar bem ajustado às variáveis do jogo, devendo realizar-se no local e momento adequados, além de exigir um nível elevado de força explosiva. Deste modo pretendemosrealizar uma análise cinemática para observarmos a diferença dos remates com e sem aceleração onde observamos 4 atletas infantis do Paio Pires Futebol Clube. Métodos: 4 atletas (grupo de exercício: 11,5±0,57735 anos; 50,25±12,68529 kg; 156,75 ±7,36546cm) realizaram cada um dois remates, um com corrida inicial (aceleração) e um sem aceleração. Resultados: A fase inicial e final do movimento dos remates com aceleraçãoapresentaram na articulação do joelho uma variação de 139,975±22,44822 graus. Nafase inicial e final do movimento dos remates sem aceleração, a articulação do joelho teveuma variação de 154,8±15,33188 graus. Conclusões: Após a análise cinemáticaobservamos que os 4 atletas têm valores semelhantes quando realizam o remate com aceleração. Já quando o remate é realizado sem aceleração os valores variam de atleta para atleta.

Palavras-Chave: Biomecânica; Remate, Cinemática, Movimento, Futebol;

Análise cinemática dos membros superiores e inferiores no lançamento de três pontos do basquetebol executado com ambas as mãos

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Resumo: Background: Lançamento de três pontos no Basquetebol é o ato de lançar ao cesto atrás de uma linha assinalada no chão que acrescentará o valor de 3 pontos ao resultado da equipa que o efetuou. Atualmente, o lançamento de três pontos é considerado o lançamento mais importante do jogo de basquetebol e devido à sua importância, o movimento ou ato de lançamento engloba a participação de vários grupos musculares durante a execução do mesmo. Assim, analisamos a ação dos membros superiores e inferiores na execução do lançamento com ambas as mãos num grupo de atletas amadores, de modo a compreender as diferenças da execução das 4 fases do lançamento utilizando a mão dominante e a mão mais fraca. Métodos: Oito atletas amadores (grupo de exercício: 19.87±1.95 anos; 72.62±11.32 kg; 179.62±5.20cm) realizam uma repetição do lançamento com o braço direito e outra com o braço esquerdo. Resultados: a fase inicial e final do movimento do lançamento com o braço direito apresentou na articulação do joelho uma variação de 109.43±19.34 a 166.81±5.31 graus e na articulação do cotovelo de 75,92±22.83 a 153.38±24.02. Com o braço esquerdo a articulação do joelho variou de 109.62±15.31 a 170.43±5.48 graus e a articulação do cotovelo de 77±17.64 a 163.7±12.09 graus. Conclusões: Existem alterações no gesto técnico entre a mão esquerda e a mão direita devido ao facto de dentro do grupo de exercício existir atletas com mãos dominantesdiferentes logo, uns vão efetuar melhor o gesto técnico com a mão direita e outros com a mão esquerda.

Palavras-Chave: Biomecânica; Cinemática; Lançamento; Movimento

Efectos del rodillo de espuma sobre el rango de movimiento, la flexibilidad, la fuerza y el dolor muscular de inicio retardado en deportistas de alto rendimiento: Una revisión sistemática

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Resumo: El "Rodillo de Espuma" (RE) es un instrumento de liberación miofascial autoinducida, para aplicar presión de forma directa sobre la musculatura esquelética. Evaluamos el impacto del RE sobre el sistema musculoesquelético en deportistas de élite, tratando de identificar los mecanismos que influyen sobre los tejidos miofasciales. Siguiendo las directrices *Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA), revisamos sistemáticamente estudios indexados en Web of Science, Cochrane y PubMed. Se incluyeron estiudios originales publicados desde el 2018 hasta el 30 de marzo de 2023, con diseño de ensayo controlado o pre-post intervención. Utilizamos la escala PEDro para evaluar de la calidad metodológica. Entre los 141 registros identificados en la búsqueda, un total de 10 estudios cumplieron los criterios de inclusión y exclusión. En general, el uso de RE, en los deportistas de alto rendimiento, mostró mejoras significativas sobre el ROM y flexibilidad, y efectos notablemente beneficiosos sobre el DOMS y la fuerza, sin efectos adversos en el tejido miofascial. El uso RE, parece seguro, siendo un instrumento efectivo para la mejora de las cualidades físicas de movilidad, fuerza y flexibilidad, y disminuir el DOMS incrementando del rendimiento deportivo por sus beneficios sobre la arquitectura miofascial, atenuando la inflamación y el dolor.
Palavras-Chave: (5 palavras) Rodillo de espuma. Inducción miofascial. Flexibilidad. Rango de movimiento. DOMS.

Efecto de los ejercicios de fortalecimiento de los músculos de la cadera sobre el dolor y la discapacidad en pacientes con dolor lumbar. Una revisión sistemática.

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Resumo: El dolor lumbar es un problema de salud que afecta al 70-80% de la población en los países occidentales. Debido a la relación biomecánica entre la región lumbar y la cadera, se cree que fortalecer los músculos de esta articulación podría mejorar los síntomas de las personas con dolor lumbar. El objetivo del estudio es evaluar la evidencia actual sobre la eficacia de los ejercicios de fortalecimiento de la cadera para reducir el dolor y la discapacidad en personas con dolor lumbar. Los ensayos clínicos se recopilaron de las bases de datos de PubMed, PEDro y Scopus publicadas hasta marzo de 2023. Con base en las pautas *Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA) y utilizando las herramientas CASpe y PEDro para la evaluación de la calidad metodológica, seleccionamos estudios que incluyeron ejercicios de fortalecimiento de la cadera como parte del tratamiento del dolor lumbar y midieron los parámetros de dolor o discapacidad. Entre los 966 registros identificados en la búsqueda, un total de 7 estudios cumplieron con los criterios de selección establecidos. En general, los participantes que realizaron ejercicios de fortalecimiento de la cadera tuvieron mejoras significativas en el dolor y la discapacidad. La calidad metodológica de los estudios incluidos se evaluó como "buena". En conclusión, la adición de ejercicios de fortalecimiento de los músculos de la cadera en el tratamiento del dolor lumbar es eficaz para mejorar el dolor y la discapacidad.

Palavras-Chave: Lumbalgia; cadera; fortalecimiento; discapacidad; ejercicio