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Abstracts



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A bibliometric analysis on sports management



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Objective: This study aimed to examine the scientific publications on sport management according to "key words, citations, distribution by country and the most cited works" using a qualitative research method, namely case study.

Method: Document analysis technique was used for data collection and limited to the years between 1982 and 2021. The research data was obtained from 878 scientific publications indexed in SCI-Expanded, SSCI, A&HCI, CPCI-S, CPCSSH, BKCI-S, BKCI-SSH or ESCI with the keyword "Sport Management" and analyzed using descriptive analysis technique. Analysis of the results revealed that there are 10 types of publications on sport management with the most common type being scientific articles with 365 examples. Keyword network mapping showed that "sport management" was the word that stood out. Data analysis was visualized with VOSviewer (Version 1.6.9) visual mapping program and presented as tables and density maps in the findings section.

Results: As a result, this study improves situational awareness by highlighting the issues that sports managers should pay special attention to. From a scientific point of view, it will help to identify research gaps that will be presented to be explored in future studies.

Conclusions: This research, which deals with the current situation in sports management within certain limits, can also be considered as an important indicator in terms of showing the place of sports management in scientific studies. It is expected that this research will make various contributions to both the researchers and the related literature, such as the variety of topics and the limitedly studied keywords in the field. The main limitation of this study is that the studies outside the specified indexes are not included in the scope of the research. In future studies, the limits of the research can be expanded in the titles such as the number of keywords, universities, etc., together with the scope of the index.

Keywords: Sport management, Bibliometric, analysis, VOSviewer, Web of Sciences

A smartphone-based intervention to reduce sitting and screen time in office workers: a study protocol for a randomized controlled trial



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Objective: To present the study protocol of the Technology & Movement study, which aims to evaluate the efficacy of a smartphone-based intervention to reduce sitting and screen time at workplace.

Method: This cluster-randomized controlled trial will recruit 600 desk workers. Participants will be eligible if they spend at least 4 hours sitting at the desk and have their own smartphone. Workers will be excluded if they have a health condition that can interrupt the intervention. The employees of each office will be randomized to the intervention or control group. Participants in the intervention group will have access to the main app to complete the program. The primary outcomes are sitting time, physical activity, and screen time, which will be recorded by the app before, after, and during the intervention (3 months). As secondary outcomes, well-being, health, and work-related outcomes will be measured.

Results: The results of this study will introduce useful knowledge for future research because the use of applications facilitates data collection. Furthermore, the impact on secondary outcomes can elucidate the need to increase the quality of support for these issues by institutions and companies.

Conclusions: This article describes the design of a cluster randomised control trial that will evaluate the efficacy of a smartphone-based intervention at work to reduce sitting and screen time. By assessing the impact of this intervention, the current study will shed light on new strategies to improve and teach healthy habits to office workers.

Keywords: Protocol, Intervention, Workplace, Sedentary, Smartphone

Acute response of rest redistribution set structures on mechanical and metabolic fatigue after resistance training



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Objective: To investigate the acute mechanical and metabolic responses to resistance training (RT) sessions with different loading configurations and Rest Redistribution set structure.

Method: Following the assessment of one-repetition (1RM) strength and full load-velocity relationship in the bench-press exercise, eighteen resistance-trained men performed, in a randomized order, four different RT configurations [SxR (%1RM) (inter-set rest)] in the bench-press exercise: 1) 3x16 (40% 1RM) (5 min); 2) 6x8 (40% 1RM) (2 min); 3) 3x8 (80% 1RM) (5 min); 4) 6x4 (80% 1RM) (2 min). Selected mechanical (velocity against a 60% 1RM load) and metabolic (blood lactate) variables were assessed before and after exercise.

Results: Significantly higher lactate concentrations and velocity loss were observed after each RT configurations ($P < 0.001$). In this regard, significant higher lactate concentrations were observed in 3x8 (80% 1RM) (5 min) compared to 6x4 (80% 1RM) (2 min) ($P < 0.05$). In addition, lower velocity loss was observed in 6x8 (40% 1RM) (2 min) compared to 3x8 (80% 1RM) (5 min).

Conclusions: More frequent and abbreviate inter-set rest times seems to allow maintaining mechanical performance and mitigating metabolic stress. RT configurations with abbreviate and more frequent inter-set rest times could be recommended for the maintenance of higher mean velocities and to induce lower level of fatigue during training.

Keywords: Resistance training, Rest redistribution, Acute response, Velocity loss.

Addiction to social networks and the practice of physical activity in adolescent students



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Objective: To describe the addiction to social networks and the level of Physical Activity (PA) practice of adolescents considering the role of sex, age and body mass index (BMI).

Method: This is a descriptive cross-sectional study, in which 103 students (14-17 years of age) participated. A sociodemographic questionnaire, the Scale for measuring students' addiction to social networks and the Global Physical Activity Questionnaire (GPAQ) were used. The BMI of the schoolchildren was obtained in a self-reported manner. The analysis of descriptive data and ANOVA was carried out using SPSS Statistics in version 27.0.

Results: Schoolchildren get older they experience more satisfaction from being connected to social networks. A certain obsession with being informed has also been found, which is described as a discomfort produced when adolescents cannot connect and consult their social networks. The study data show that overweight schoolchildren make more use of social networks and finding a negative correlation between addiction to social networks with the level of PA practice.

Boys are more active than girls, both in activities of moderate and intense intensity. BMI generates a favourable trend for

normopese schoolchildren, who are more active than those who are overweight or obese. Finally, this study shows a higher level of physical activity in younger schoolchildren.

Conclusions: The level of satisfaction with the use of social networks increases with age. The level of moderate PA practice is higher in boys, with normal-weight schoolchildren being more active than those with excess weight.

Keywords: Students, Addictive behaviors, Social networks, Physical activity

Analysis of the evaluation results in a subject with a cooperative and telematic learning proposal



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Objective: To analyse the evidence and learning outcomes of students enrolled in a subject based on a cooperative learning approach during the teaching-learning process and using digital tools and a telematic format.

Method: The learning outcomes of the students enrolled in the subject Interdisciplinary Work were analysed based on their academic grades average for evaluated element of the subject. The evaluated students were 3rd year students of the Bachelor degree in CAFE at the University of Vic- Central University of Catalunya. In addition, Pearson's correlation is employed to analyse the relationship between students' academic grades regarding the learning content of cooperation with others.

Results: The arithmetic median of the students' educational results is 7.4 valuing the viability of the cooperative proposal in the subject. There is a positive correlation among students between academic grades in the evaluation of cooperation and the other learning evidences not linked with cooperation.

Conclusions: Students obtain positive academic grades, evidencing that students achieve the learning objectives intended at the beginning of the subject. Finally, teams that cooperate positively also obtain better learning results (Pujolás and Lago, 2011), which emphasizes the importance of cooperation, even if it is proposed in telematic form.

Keywords: Technology, Cooperative Learning, Higher Education, Students, Academic Performance.

Application of the adapted healthy employees questionnaire from the HERO model and analysis of the stress levels on university workers



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Objective: To know the health status of employees from the adapted HERO Healthy Employee questionnaire with five dimensions (self-efficacy, mental and emotional competence, self-esteem and optimism, social resources, and engagement) allows the development of proposals to improve their health. Also, the stress measured objectively through the Heart Rate Variability (HRV) can provide more information on workers' health. The aims of this study is (1) to know the current health of the university workers, following the HERO questionnaire, adapted to five dimensions, (2) to analyse the stress level through HRV, and (3) to

identify the relationship between HRV and the 5 dimensions of the questionnaire.

Method: A sample of 1000 university workers will be invited to answer voluntarily to the adapted HERO questionnaire and record their HRV for at least two consecutive days with the Firstbeat Bodyguard2 device.

Results: It is expected to obtain information on the five strengths of the healthy employee, through the adapted questionnaire, and to compare each of the dimensions with physiological stress.

Conclusions: The adapted Healthy Employee Questionnaire could be used as an indicator of stress levels in university workers if a correlation with the HRV is observed.

Keywords: Heart Rate Variability, Employees, Wellness, Company, Health.

Assessing young players' emotional experience during tag games



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Objective: The present study aimed to assess the emotional experience of young players during a variation of the classic tag game.

Method: Nineteen young male soccer players (age: 12 ± 1 years) played a variation of the game for 10 min in a 15×30 m rectangle. The tagger had to catch a hare with a ball using their hands but was only allowed to catch below the head. Before starting the hunt they had to count to three. Players assessed the intensity of their emotional experience using the BECS scale of perceived enjoyment and competence (Arias-Estero et al., 2013).

Results: The perceived enjoyment and competence levels of players during the tag game were 3.6 ± 1.1 (range: 2.0–5.0) and 3.8 ± 0.8 (range: 2.8–5.0), respectively. The coefficients of variation in the players' perceived enjoyment and competence were 31% and 21%, respectively.

Conclusions: Teachers and sports coaches should consider the high variability of emotional experiences in tag games when planning the school year and sports season.

Keywords: Game-based education, Learning strategies, Motor game, Enjoyment, Perceived competence

Assessment of the use of seminars for the introduction to theoretical contents in the degree of sports sciences



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Objective: To analyze learning outcomes of online interdisciplinary seminars.

Method: Comparative study with fourth year students of Sports Sciences Degree. 60 students of "Design and programming of physical exercise for people with pathologies and health

problems" subject was included in this work. 30 students participated in 90 minutes online seminars with physicians, physical therapists, and physical educators and other 30 students were in a traditional oral class of the same duration with the theoretical explanation. The contents treated were around the contextualization of the interdisciplinary team from the perspective of the different professionals. Evaluation was carried out through a questionnaire examination through google forms at the end of seminars.

Results: Questionnaires at the end of the intervention showed higher values when applying the seminar methodology than the group that attended traditional oral classes.

Conclusions: Results of this learning process were adequate, since the large percentage of students answered positively to the questions in the questionnaires related to the content of the introduction to the interdisciplinary team in the framework in Sport Sciences Degree.

Keywords: Seminar, Interdisciplinary, Pathology, Online education.

Assessment of young players' external load during tag games



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Objective: The present study aimed to evaluate the external load of young players during a tag game.

Method: Nineteen young male soccer players (age: 12 ± 1 years) played, for the first time, a variation of the classic tag game for 10 min in a 15×30 m rectangle. The tagger had to catch a hare with a ball using their hands but was only allowed to do so below the head. Before starting the hunt, they had to count to three. The number of accelerations per minute (ACC min) was measured using a local positioning system. To compare the physical response of the players during the game, the 10 min were split as follows: (a) 1st interval = 0:00-2:30 min; (b) 2nd interval = 2:30-5:00 min; (c) 3rd interval = 5:00-7:30 min; and (d) 4th interval = 7:30-10:00 min.

Results: Mean ACC min was significantly lower in the 1st interval compared to the rest (1st vs 2nd interval [29.8 ± 0.6 vs 33.2 ± 0.6] - $p = 0.00$; 1st vs 3rd interval [29.8 ± 0.6 vs 33.0 ± 0.6] - $p = 0.00$; 1st vs 4th interval [29.8 ± 0.6 vs 35.6 ± 1.1] $p = 0.00$) and in the 3rd interval compared to the 4th ($p = 0.02$). No significant differences were found between the 2nd interval and the last two (vs 3rd - $p = 1.00$; vs 4th - $p = 0.06$).

Conclusions: The duration of the game determined the frequency of accelerations carried out by the players during the tag game.

Keywords: Physical Education, Training, Traditional game, Physical response

Association between muscle strength and reaction time performance in older people



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Objective: To examine the associations between muscle strength and reaction time performance in older people over 60 years.

Method: 290 older people (69.35 ± 5.55 years, 51 men) were assessed. Muscle strength was assessed using a dynamometer (TKK 5001, Grip-A, Takei, Tokyo, Japan). Reaction times were measured by means of an optoelectric detection device, the OptoGait reaction time reactivity system (Microgate Italia, Bolzano-Bozen, Italy). Reaction times of the lower extremities were evaluated both acoustically (ALLRT), visually (OLLRT) and optoacoustic (OALLRT). Linear regression analyses were performed on muscle strength and reaction time performance variables.

Results: There were significant associations between muscle strength with OALLRT ($p=0.035$) and ALLRT ($p=0.006$) after adjusting for confounders (sex, age and education level). There was not significant associations between muscle strength and OLLRT.

Conclusions: In conclusion, the findings of the present study suggest that among people aged >60 years the risk factors for sarcopenia, specifically muscle strength, were independently associated with lower-limb reaction times.

Keywords: Elderly, Sarcopenia, Times of Reaction, Strength.

Comparison between lactate and muscular oxygenation thresholds in trained runners



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Objective: Lactate threshold (LT) is one of the key parameters of endurance performance. The determination of LT by alternative and less invasive methods, such as using near-infrared spectroscopy (NIRS), is still under validation. Moxy Monitor is an accessible commercial NIRS device that informs of the percentage of saturated muscle oxyhemoglobin (SmO₂) in situ and can be an alternative tool to estimate LT. The aim is to compare LT and SmO₂ threshold by NIRS in trained runners.

Method: Ten male (age 26.7 ± 8.2 years, body fat 12.5 ± 3.0%), performed an incremental step-test from 6km/h, increasing 2km/h every 4 minutes until exhaustion. NIRS device was placed at vastus lateralis. At the end of the 4-minute step, a sample of capillary blood was taken for lactate concentration assessment. The LT and SmO₂ thresholds were established by the log-log method. A Wilcoxon and a Spearman test were made for comparison. All tests were with 95% of confidence.

Results: The median ± interquartile range velocity for LT was 10.5 (10.1-11.4) and for SmO₂ was 11.7 (10.7-13.4) Km/h. The Wilcoxon test was not significant ($p=0.193$), either the Spearman correlation ($r=0.018$, $p=0.973$). The intra-class correlation coefficient (ICC) was -0.105 with IC 95% -0.647-0.525.

Conclusions: The threshold velocity by SmO₂ with a Moxy monitor was comparable with the obtained by LT in trained males, but with a very low correlation and ICC, although the main limitation was the high variability of the SmO₂ and the low sensibility of the evaluation steps.

Keywords: Lactate Threshold, Near Infrared Spectroscopy, Running

Match and training physical demands of eight-a-side football in u10 and u12 young players using global positioning systems (GPS)



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Objective: The aim of the present study was to analyse performance variables and physical demands of U10 and U12 football players according to playing position, pre-match training and match (MD-4, MD-2 and MD).

Method: Twenty-one U10 and U12 amateur players were analysed using the GPS, with a total of 504 observations. The variables of total distance, distance in high intensity and sprint, maximum speed, time interval between accelerations, maximum speed acceleration, maximum acceleration, acceleration distance and number of high-intensity accelerations were analysed in absolute and relative values with respect to competitive match play.

Results: The most notable differences in the U10s showed that midfielders in matches covered higher distance and higher intensity acceleration than in training ($p<0.05$; ES: 0.72 to 1.57) and at a with respect to defenders and forwards ($p<0.05$; ES: 1.05 to 2.00). In the U12s the midfielders in matches covered a higher distance and at a higher intensity than in training ($p<0.05$; ES: 1.05 to 2.39). The relative results compared to match day in the U10 category, showed midfielders had a significantly lower percentage of total distance than defenders and forwards ($p<0.05$; ES: 0.76 to 0.83).

Conclusions: The present study indicates that the physical demands of young footballers in training and competition are influenced by the playing position and the age category. The playing position influences the physical performance in such a way that the U10 and U12 midfielders cover longer distances and perform a higher number of high-intensity actions in training and matches than the defenders and forwards. With regard to the importance of the category, the U12 players present fewer differences in physical demands between positions and trainings and matches due to their greater experience and age. The physical demands of the players in training are higher than in matches due to the rules of the game itself because the training is longer than a match and based on a learning and development approach, contrary to the loads of training in adult players, which are based on reaching the match day in the best shape.

Keywords: Football. Young players. GPS. Match, training.

Determinants and prediction of maximal fat oxidation in healthy young adults



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Objective: We aimed to identify the determinants of maximal fat oxidation (MFO). Moreover, to developed equations to predict MFO based on the availability of resources and equipment in adults.

Method: Eighty-two adults (62% males; 22.7±4.4 years) were included. Firstly, an incremental exercise protocol with two consecutive phases was performed to determine MFO and VO₂max. The first phase aimed to determine MFO and consisted in 3 min steps of 15/30W until RER ≥1. After 3-5 min rest, the second phase to detect the VO₂max was initiated until exhaustion (with increments every minute). Secondly, plasma TAG, body composition, handgrip and long jump tests were assessed. Moreover, nutritional intake and objectively measured physical activity were assessed during one week. Multiple linear regression analyses were performed to identify the determinants of MFO and specific command allset from STATA was used to select the best prediction models of MFO between 65,535 regression models automatically executed.

Results: Sixteen relevant and independent determinants of MFO have been identified. Then, these determinants have been used to develop three equations to predict MFO in adults. The best equation models proposed explained 60% of the variability of MFO using only three variables (i.e. 8.81 - 0.19 x waist circumference (cm) + 0.25 x body fat (%) + 0.01 x VO₂peak(ml/min)) (p<0.001).

Conclusions: This study identifies key determinants and predictors of MFO. Moreover, three equations have been developed from thousands of models' combination, selecting these with the highest prediction values for MFO, achieving to explain 60% of the MFO.

Keywords: Fat oxidation, Physical exercise, Cardiorespiratory fitness, Fatmax.

Digital environments in Higher Education. Gamifying for teaching



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Objective: The aim of this work is to show the technological environment of a subject based on Gamification so that it can be used as an example for similar interventions in educational environments.

Method: In relation to Teaching Teaching methodologies, I have opted for those known as active methodologies, and within them, specifically for Experiential Learning developed by (Dewey, 1938/1997 and Kolb, 1987), among other authors.

I understand that these methodologies empower students and give them responsibility for their learning process, making them active and critical people who participate in economic, social and cultural life, with a critical and responsible attitude and with the ability to adapt to changing situations.

In addition, and in a transversal way, I think it is very interesting to work on emotional competences that make students not only skilful in their work but also able to manage their emotions in an adequate way.

Specifically, I am interested in stimulating positive internal emotions (Aguado, 2014), curiosity, admiration, security and joy as the basis for my students' learning.

Results: In the proposal made, we understand learning as a process of global personal transformation that is not limited to the accumulation of knowledge, but involves the acquisition of skills that contribute to social and personal development integrating biopedagogical dimensions such as cognitive, affective and axiological (Rosa, García-Cantó, Pérez, 2019. P.1), which implicitly carry the social and civic nature of pedagogy.

In the same way, we are committed to alternative and largely technological teaching models that stimulate personal and social responsibility, according to Metzler's classification (2011), by which students become aware of the importance of the contents of Physical Education not only for their motor performance but also for the opportunities that these offer them to take responsibility for themselves and others.

Conclusions: I have tried to choose an assessment system aligned with the objectives and learning outcomes and competences to be acquired in the course, which is focused on experiential learning, and is committed to formative and shared assessment. Conceiving assessment, as Fraile and Cornejo (2012) do, as another formative aspect.

Meaningful learning based on responsibility, experience and competence development is proposed, so the tools that have been chosen to carry out this assessment are focused on the process (López-Pastor, 2012) such as the teacher's notebook, specific learning activities, such as projects, case studies and field practices, student productions and student monitoring sheets such as the class diary and the practical and cognitive challenges, and the processes of self-assessment, peer assessment and shared assessment.

Keywords Adventure Sport, Physical Education, Apps, Gamification

The effects of an exercise program for older adults through IGOID-FITBE



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Objective: The aim of this longitudinal study was to analyze the effect of a 12-week physical exercise online program on the physical fitness and quality of life of older adults.

Method: A total of 12 older adults (63.17±7.86; 83.3% women) from a municipal sports school participated in the study. Through the "Healthy Elderly Sportec" protocol, data on anthropometry, cardiorespiratory fitness, strength, mental health, and physical health were assessed at the beginning and end of the intervention. The intervention program consisted of 24 online sessions of strength, balance and coordination work led by qualified

personnel through the IGOID-FITBE digital platform and the "Apptivados" app.

Results: The results showed that the participants significantly improved their aerobic capacity after completing the online physical exercise program ($p=0.003$). In addition, there are significant differences in BMI between sex ($p=0.02$). No significant differences were found in strength, physical health, and mental health ($p>0.05$)

Conclusions: In conclusion, the older adults improved their cardiorespiratory fitness in addition to showing great satisfaction with the achievement of this new online exercise program from their homes and through technology, thus improving their physical level and quality of life.

Keywords: Health, Physical activity, Physical fitness, Quality of life, Healthy habits.

Effects of ageing and fitness on one-legged hopping biomechanics



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Objective: Our study aims to analyze the impact of age and training status on one-legged hopping biomechanics, to assess whether age-related power decline can be counteracted with regular physical training.

Method: Forty-three male individuals were recruited and divided into four groups according to their age (young between 21-35, or senior between 59-75) and training status (inactive, or active). Activity levels were quantified using the Freiburger questionnaire for physical activity (threshold for inactivity set to 25). Active individuals were track and field athletes performing either sprint (up to 400m) or jumping long & high jump). Thus, four groups were established: young active (YA; $n=10$), young inactive (YI; $n=12$), senior active (SA; $n=10$), senior inactive (SI; $n=11$). All subjects performed a multiple one-legged hopping test on a force platform (Novotec Medical, Leonardo). The three highest hops were isolated and the following biomechanical parameters were computed for each hop and averaged: hop height, ground contact time, peak ground reaction force, center of mass displacement and vertical stiffness. Group means were compared using the one-way analysis of variance (ANOVA) method.

Results: YA and SI showed the highest and lowest hopping performance respectively, while there were no differences between YI and SA. Ground contact time was shortest for YA, with no differences between YI, SI and SA. Peak ground reaction force was highest for YA, with no differences between YI, SI and SA. No differences among groups were found in center of mass displacement. Vertical stiffness highest for YA, with no differences between YI, SI and SA.

Conclusions: As expected, the YA group achieved the highest performance in the described multiple one-legged hopping test, and the SI group achieved the lowest performance. Nevertheless, there were no differences between YI and SA, showing therefore that chronic training can contribute to a certain extent in keeping power levels. Besides, no biomechanical differences between YI and SA were found.

Keywords: Aging, Jumping, Biomechanics, Power, Stiffness.

Effects of a 6-weeks training program based on flywheel technology on vertical jump and sprint time in female soccer players.



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Objective: To analyze the effects of a 6-week in-season training program on jump and sprint performance using a flywheel resistance training device (FRTD) in female soccer players.

Method: Twenty female soccer players (age: 20.4 ± 2.6 years) participated in this study and were randomly assigned to a flywheel training group (FWTG) or a control group (CG). FWTG performed an extra 6-weeks resistance training using a FRTD (Kbox 3, Exxentrix AB, Stockholm, Sweden) in addition to the usual on-field training. CG continued their usual training sessions without performing any complementary resistance training. Two-way mixed ANOVA repeated measures test was performed to compare the changes in Time (Pre vs Post) by Group (FWTG vs CG). Effect size was calculated using the eta-partial squared (η^2p). Significance was set at $p<0.05$.

Results: There were no significant differences in any performance measure changes between groups. FWTG improved their vertical jump height ($+5.61 \pm 7.3$ %), while CG decreased (-0.38 ± 6.61 %). FWTG (-0.55 ± 1.81 %) and CG (-0.59 ± 3.53 %) slightly improved their sprint time. Effect size was greater in vertical jump height ($\eta^2p = 0.182$) than in sprint time ($\eta^2p = 0.001$).

Conclusions: Squat exercise on FRTD did not significantly but substantially improve the vertical jump performance. Sprint performance was improved but not likely to the use of a FRTD. These results could help coaches to decide which kind of device is more suitable to improve vertical jump performance in female soccer players.

Keywords: Jump performance, Sprint, Resistance training, Flywheel.

Effects of a program of physical reeducation, based on digital contents, to improve physical fitness in an adult inactive woman. A case study



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Objective: The aim of this study was to analyze the effect of a Physical Re-Education intervention program, based on digital content: YouTube, on the physical fitness and exercise enjoyment of an inactive adult woman.

Method: The subject performed Physical Reeducation physical training 3 days a week, for 4 weeks, in 45-minute sessions. A total of 12 sessions consisted of strength, endurance, coordination and speed of movement exercises. Each session incorporated fundamental motor skill games. All the tasks and activities were designed based on the development of a study of physical activity present in social networks (YouTube).

The fitness parameters evaluated were: BMI and WHI, aerobic endurance (2-minute step test), upper body strength (push-up test), lower body strength (vertical jump test), coordination and agility (zig-zag test) and movement speed (tapping test). Physical Activity Enjoyment Scale (PACES) was used to assess the extent to which the subject enjoys doing any given physical activity.

Results: No changes were recorded in either BMI or WHI. Better results were obtained in the 2-minute step test (53%), in the push-up test (17%) and in the vertical jump test (29%). Slight improvements were recorded in the tapping test (5") and in the zigzag test (9"). Regarding the level of enjoyment, out of the 16 items of the PACES scale, some results stand out in items 1, 4, 6, 8, 9.

Conclusions: After the positive results of this case study, we propose to make a solid foundation of the concept of Physical Re-education.

Keywords: Physical Re-education, Digital Contents, YouTube, Adults, Physical Fitness, Enjoyment.

Effects of the set configuration on strength gains during a resistance training program using the bench press exercise



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Objective: To examine the evolution of one-repetition maximum (1RM), the velocity (maximum, average, and minimum value), and loss of velocity

Method: Thirty-two resistance-trained men participated in this study assigned into three training groups: traditional (TR, n = 12), cluster-1 (CL1, n = 10), and cluster-2 (CL2, n = 10). Subjects trained for 11 sessions following a velocity-based strength training performing the BP exercise. The three groups trained at the same relative intensity and volume, but they differed in the set configuration and total recovery time as follows: (a) TR consisted of 3 x 12 repetitions at 60% of 1RM with intersets rest intervals of 4 minutes, (b) CL1 used the same structure as TR (i.e., 3 x 12 repetitions at 60% of 1RM with intersets rest of 4 minutes) with an additional 30 seconds intraset rest after the 6th repetition of each set; and (c) CL2 used the same structure as TR with an additional 30 seconds intraset rest after the 2nd, 4th, 6th, 8th, and 10th repetition of each set.

Results: Significant differences were observed in the velocity loss within the set among groups: $47.0 \pm 6.4\%$, $43.0 \pm 7.2\%$, and $25.9 \pm 6.6\%$ (TR, CL1, and CL2, respectively, $P = 0.001$). A significant time effect was observed ($P < 0.001$) for 1RM from Pre- to Post-training session, without significant "group x time" interactions ($P = 0.50$). Moreover, no significant "protocol x time" interactions ($P = 0.66$) were observed for the evolution of the estimated 1RM strength in the BP throughout the 11 sessions for each resistance exercise protocol. Significant differences between groups were observed for the number of repetitions completed at different velocity ranges: $< 0.2 \text{ m} \cdot \text{s}^{-1}$ ($P = 0.03$); $< 0.3 \text{ m} \cdot \text{s}^{-1}$ ($P = 0.004$); $0.3 - 0.4 \text{ m} \cdot \text{s}^{-1}$ ($P = 0.003$); $0.4 - 0.5 \text{ m} \cdot \text{s}^{-1}$ ($P = 0.002$); $0.7 - 0.8 \text{ m} \cdot \text{s}^{-1}$ ($P = 0.001$). For the rest of the ranges, no significant differences between groups were found.

Conclusions: The three groups showed similar improvements in 1RM strength throughout the training program. It was also observed that introducing a 30-second recovery period every two repetitions in the BP exercise allows for better maintenance of lifting velocity, that is, a lower degree of fatigue, compared to the rest of the groups.

Keywords: Resistance training, Fatigue, Strength, Intra set rest

eHealth Platform to study the benefits of physical activity in cancer patients



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Objective: Cancer is undoubtedly one of today's biggest health problems, with 1 in 2 men and 1 in 3 women predicted to be diagnosed with cancer in their lifetime.

Cancer patients have been shown to significantly reduce the amount of exercise they do during treatment. In fact, the effect of physical activity on disease progression has been and is being extensively studied by professionals in the field.

The benefits accrued through exercise during and after treatment have been extensively reviewed. A recent publication reported that, as of 2019, 140 meta-analyses were published of which approximately 75% showed a statistically significant and clinically relevant benefit through exercise on a variety of treatment-related side effects, physical, functional and psychosocial outcomes.

The objective is to bring together, in a single solution (technological platform), all the relevant phases in the practice of medical trials with oncology patients, digitising the sequence of actions taken when participating in a trial and promoting the exchange of information between the different collaborating agents by aggregating all the information at a single point, in order to subsequently analyse the data collected.

Method: To be part of the study, participants must meet the following inclusion criteria: any adult diagnosed with cancer in the 2 years prior to entering the research study. Patients must be undergoing or have completed cancer treatment. They must be able to move with no medical conditions excluding them from being physically active.

The study consisted of a 3 months exercise program and 9 months follow up assessments at 6 and 12 months after the initial evaluation. The tests included in the study as part of the 0, 3, 6- and 12-months assessments, and whose data are stored in the platform are: functional capacity, quality of life measured by the general SF-36 questionnaire and the cancer specific quality of life "European Organization for Research and Treatment of Cancer QLQ-C-30" questionnaire, cancer-related fatigue (Functional Assessment of

Chronic Illness Therapy-Fatigue (FACIT-Fatigue)), the level of physical activity objectively measured with Actigraph wGT3X-BT accelerometer, body composition and strength.

The technological platform consists of the design, development and deployment in the cloud of a platform that includes a backend capable of providing a robust, secure and unified form of authentication and data storage.

To do this, Django technology is used to expose a REST API that operates on a relational postgresql database. In this way, both users and developers can access the platform's functionalities and data.

Likewise, the proposal incorporates a responsive, visual and intuitive frontend developed in React and antd, following the WCAG accessibility standards, proposed by the W3C, and WAI-ARIA, among others. In this way, all the actors, including patients, are provided with a space where they can manage and visualise all the information entered and generated: first visit tests, appointments, results of physical tests, etc.

Results: The developed platform enables improved communication between oncologists, primary care physicians, patients and physical activity researchers.

Data collection has been centralised and optimised, making it accessible to all stakeholders.

Data analysis is expected to provide promising results on the benefits of physical activity for cancer patients.

Conclusions: Progress has been made towards digitization in all aspects of clinical data processing, including physical activity data, and all specifically oriented towards oncology patients.

All the partners involved are positive about the results obtained, especially with the visual interface of the application, which has been perfectly adapted to the use case, meeting the needs of the users, as this is what patients interact with in the end. This is precisely what worries them the most, as they are aware of the resistance that some people will offer when it comes to integrating it into their procedures.

Keywords Data collection, Technological platform, Physical activity, Oncology, Patients

Estimating resistance training volume in bench press exercise in women through velocity loss



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Objective: The aim of this study was to analyze the relationships between the percentage of repetitions performed (%Rep) and the velocity decline during a single set to failure performed against 4 different relative intensities (50, 60, 70, and 80% 1RM) in the bench press exercise in women.

Method: Sixteen physically active young women (age: 22.3 ± 2.3 yrs; height: 164.5 ± 4.0 cm; body mass: 61.7 ± 5.9 kg; 1RM: 42.2 ± 8.1 kg; 1RM/body mass: 0.70 ± 0.16) participated in this study. Subjects were randomly assigned to perform the maximum number of repetitions with each one of the 4 relative intensities separated by a 1-week period. The velocity employed for each relative intensity was calculated throughout the general equation previously defined in women (4).

Results: A strong relationship was observed between %Rep and %VL ($R^2 = 0.88-0.92$) for the relative intensities analyzed. Inter-individual variability in %Rep decreased as %VL increased (CV range 7.5-45.0%). Furthermore, the %Rep performed for a given VL increased as the relative intensity increased.

Conclusions: The relationships found were strong enough to consider the %VL as an accurate measure for quantifying the degree of effort in women. However, these correlation values were slightly lower than the ones observed in men (2,3), probably due to the lower experience in this population. The %Rep performed for a given VL was lower in our study than that observed in men (2,3).

Keywords: Resistance training, Bench press, Training load, Velocity loss

Evaluation of internet exploitation attitudes and electronic applications for the exercise of people during restricted measures due to Covid-19



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Objective: The aim of this research was to study Greek people's attitudes towards the use of various exercise digital platforms. In

addition, a recording of the distant exercise alternatives chosen during the restrictive measures was carried out.

Method: The total sample was 450 people who filled in a questionnaire posted for a month on social media. The questionnaire included: i) demographics, ii) a recording of portable electronic devices or online platforms and exercise applications and iii) five variables (adapted by Hsu and Lin, 2008) assessing attitudes and intentions regarding fitness and the use of new technologies in training during restrictive measures and in the future.

Results: Greek people of the sample attitudes towards participating in distant exercise programs through digital platforms or other means is quite positive. The sample's participants declared that they mainly used free platforms for their exercise, and programs that appear in social media such as Instagram, Facebook and YouTube.

Conclusions: According to the study's results, and taking into account that people seem quite positive in using distant exercise platforms in the future, exercise professionals should think of adding such services in their businesses. Tools, like electronic devices or smartwatches, can be used at any time of the day and offer an ease of use at home. Greek people, although hesitant about the use of internet technologies for their exercise, they are positive of using such alternatives both during any restrictive measures and in the future.

Keywords: Fitness, Distant exercise, Restricted measures

Fitness center applications: Intention of use according to age



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Objective: The purpose of this paper is to analyse the behavioural intentions to use the fitness centre application according to age.

Method: A questionnaire was used to collect data between July and September 2020. The sample consisted of 1678 members of Portuguese fitness centres (982 women and 696 males). The questionnaire items were derived from existing literature on the UTAUT2 model. The questionnaire also contained items to assess members' overall satisfaction. SmartPLS 3.3.3 was used for data analysis. The measurement invariance of the composite models was tested using the three-step composite model measurement (MICOM). Subsequently, for the multi-group analysis, permutation was used and path coefficients for each group were compared.

Results: The findings revealed that behavioural intentions to use the fitness centre application on use behaviour vary by age and are higher in younger members. For those aged 25 to 34, the most important constructs are effort expectancy, social influence, hedonic motivation, and habit. The age group 35 to 55 years old places a higher value on performance expectancy and aspects related to facilitating conditions. The findings also show that behavioural intentions on member overall satisfaction are higher in younger members.

Conclusions: In comparison to older members, younger members use the application more frequently. As a result, research suggests that apps for the elderly be improved to make them more intuitive and easy to use.

Keywords: Use behaviour, App, MGA, UTAUT2, PLS-SEM

Implementation of an exercise program to improve the perceived quality of life in the facilities of a private company



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Objective: To assess the impact of biomarkers related to health and satisfaction with the company of workers after implementing a physical exercise program.

Method: A exercise program was carried out at the company's facilities with 12 workers. The weekly dose consists of 2 concurrent training sessions lasting 1 hour. The evaluation of satisfaction with the company was carried out by means of a likert-type scale formulated through google questionnaires. Biomarkers were measured by means of a cardiorespiratory test (3' step test) and a lower limb strength test (countermovement jump test).

Results: The results of the intervention showed an improvement in the cardiorespiratory and lower limb strength tests, as well as in worker satisfaction with the company. The amount of time that all people did physical exercise also increased compared to the month before the intervention.

Conclusions: Implementing physical exercise programs by the company is an effective tool to improve markers such as lower limb strength and cardiorespiratory capacity and worker satisfaction with the company. We can rely on technological tools for the presentation of tasks, monitoring and assessment of the objectives as they have been done in this program. In the future, we should measure and compare these improvements if they translate into real economic benefits for the company as provided by the literature related to physical exercise and company economics.

Keywords: Exercise, Health, Strength, Cardiovascular.

Importance-performance analysis applied to the universities sports services website



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Objective: The objective of this study was to analyze the importance and performance of the website of the sports services of the University of Seville (SADUS).

Method: The selection of the sample was carried out through a non-probability sampling by Convenience, consumers of sports centers were invited to participate through a online questionnaire. The sample was 48 women and 74 men of the sports services of the University of Seville. Descriptive analysis and Importance-Performance analysis were performed to analyze the data. The instrument used was the questionnaire called "The Sport Website Quality Scale (Hur et al., 2011)", which has three items for each of its five dimensions. All items, established in two sections (importance and performance), were evaluated with a seven-point Likert scale.

Results: Regarding the Importance-Performance analysis it was obtained that all dimensions and items were above the diagonal (MV<MI), in the space "concentrate here", being the main items to improve "I can learn something valuable by interacting with other users on the SADUS website" (MV= 3'18; MI= 4'48; Di= -1,30)

and "The website of the SADUS has no errors" (MV= 4'75; MI= 5'86; Di=-1'11).

On the contrary, the items with the least discrepancy are "I trust that the SADUS website will not misuse my personal information" (MV= 6'18; MI= 6'39; Di= -0,21) and "The SADUS website is a very useful source of information" (MV= 5'45; MI= 5'76; Di= -0,31).

Conclusions: As a result of the objective set in the present study, the main conclusion has been obtained that all items or dimensions are susceptible to change, although not with the same priority.

Keywords: Customers, Perceived quality, Website, University sport, Sport technology.

Influence of multicomponent exercise programs on cognitive processes and fall risk: narrative review



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Objective: Investigate the influence of an intervention using multicomponent exercise program and cognitive stimulation with specific computer applications in a population over 65 years of age with cognitive impairment on balance performance measured by a stabilometric platform and functional tests.

Method: Review was carried out through the Pubmed and WOS databases, limiting the search to the last 5 years and using the following connectors and criteria: "multicomponent exercise program", "balance" and "fall risk" No restrictions were made regarding the type of study.

Results: Multicomponent exercise program (MCEP) is the main proposal that meets the recommendations of the ACSM. To determine the existence of a postural and balance deficit, it is common to use balance tests (Romberg or the Berg scale), and performance tests (SPPB or TUG). These methods, besides being useful, have proven to be reliable. However, they are not tools that quantify the patient's level of stability and allow differentiation between different balance or stability problems.

Conclusions: Technological advances make it possible to complement the traditional intervention on cognitive processes with new computer tools specifically designed, such as Grador or Telecognitio. For the objective measurement of balance control, the use of technological solutions and computer systems,

such as stabilometric platforms or OptoGate type gait measurement mats, is very useful.

Keywords: Elderly, Physical fitness, Cognitive impairment, Fall risk, Multicomponent training.

Influence of the use of the individual or group load-velocity relationship on the velocity loss within the series during resistance training



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Objective: The present study aimed to (1) analyze the relationship between the percentage of velocity loss (VL) and the percentage of repetitions performed (RP) with three relative intensities determined through the general (González-Badillo & Sánchez-Medina, 2010) and individual equation and; (2) to

examine the variability in %RP for different VL achieved with the different relative intensities studied.

Method: After the evaluation of the individual load-velocity relationship, 18 subjects randomly performed 6 sessions consisting of achieving the maximum number of repetitions with the loads corresponding to 40, 60 and 80% of the 1RM in the bench press exercise. The relative intensities were determined from the individual and general (González-Badillo & Sánchez-Medina, 2010) load-velocity equation proposed for this exercise (three relative intensities per equation).

Results: VL and RP showed significant correlations ranged between 0.88 and 0.93, decreasing as the relative intensity increased. No significant differences were observed in the %RP for the different VL analyzed when compared between types of adjustment (general vs. individual) for all the relative intensities studied. The RP when certain VL was reached showed coefficient of variation (CV) values between 2.6 and 34.1%.

Conclusions: VL is a suitable option to determine the degree of effort that takes place during training regardless of the method used to determine the relative intensity, which allows to guarantee a more homogeneous level of effort among athletes.

Keywords: Resistance training, Volume, Velocity loss, Degree of effort.

Next generation: strategic needs and opportunities from the digital transformation in business-sport collaboration in the Spanish sports system



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Objective: To examine the needs and opportunities for company-sport collaboration from differentiated sports models in the open system.

Method: A descriptive and interpretive research was carried out through participant observation and secondary analysis of primary sources.

Results: The results revealed the need to adapt resources to the needs of addressing the digital transformation in business-sport collaboration in all sports models. They established strategic opportunities to carry out such adaptation of resources to the elimination of barriers to sports practice, the generation of new professions typical of sports sciences and the accommodation of policies, processes, economic relations, and the legal norms.

Conclusions: The sport-business relationship can offer concrete organizational solutions that enable a development mechanism towards true planning in the field of digital transformation in sport, increasing the number of practitioners and the creation of stable, specialized, and protected employment in sports sciences.

Keywords: Digital transformation, Sports system, Spain, Sports organization.

Nutrie: a mhealth application to improve diet and healthy lifestyle habits



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Objective: The aim of this project is the design and development of a technological platform, which includes an app, capable of obtaining data, analyzing them and recommending different changes in diet / healthy habits in a personalized way. To this end, two recommendation systems were designed, one based on healthy diet indexes (A-HEI) and the other focused on the prediction of caloric expenditure in reference to certain exercises in order to be able to offer supplements to users' diets.

Method: For the development of the solution, we have made use of the React Native development framework, which can be executed on both iOS and Android. If we look at the recommender systems used in Nutrie, due to the lack of large amount of initial data, a system based on content filtering has been initiated, but with a view to being able to offer a mixed system that takes into account both the results of other users and the content.

Results: The result of the project is a e-m-health platform through which the user can enter their data regarding their diet and physical activity so that the application can recommend different improvements in their healthy lifestyle habits.

Conclusions: Nutrie has prioritized the improvement of healthy habits of users over the search for a purely aesthetic slimming. Nutrie seeks to improve health through physical activity and a varied diet, taking into account the prediction of a caloric expenditure that will be carried out in a way that is intended to anticipate the needs of the users.

Keywords: React Native, Nutrition, Physical Activity, mHealth, health promotion

Open Data For Sport Governance



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Objective: The general objective of this communication is to present an organizational performance (OP) assessment IT Tool, as well as to present a methodological framework to analyze, compare and help sport organizations to be managed in a more efficient way.

The approach aims to understand how the fundamental dimensions of the OP on a sport organization determine success or failure of overall performance within such entities.

Method: Since the existing literature does not suggest any stipulated method of evaluation, the IT Tool is supported by a multidimensional model based on the (1) Goal Attainment, (2) System Resource, (3) Internal Processes and the (4) Strategic Constituencies "classical" models.

Finally, the measurement of the OP of the sport organizations is carried out through 10 dimensions (1. general information, 2. governance, 3. strategic, 4. sport and events, 5. human resources, 6. marketing & communication, 7. social responsibility, 8. IT & procedures, 9. finance management, and 10. Forecasting) with a total of 111 indicators.

Results: Authors aim to provide a practical tool for the policymakers and high-performance managers, as KPI's can support decision-making and facilitate policy implementation more efficiently and effectively

Conclusions: The IT tool developed (based on the conceptual framework proposed by the authors) could be the first step for open data applied to sports organizations and become the open data reference for clubs, federations and national Olympic committees.

Keywords: Organizational Performance, Effectiveness, Sport Organizations, Data Analytics.

Relationship between the use of screen devices for educational use with the weight status of adolescent students



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Objective: The present study aims to analyze the relationship between the use of screen devices such as computers and Tablets and the body mass index of schoolchildren.

Method: A cross-sectional descriptive study was designed, where 103 students of Compulsory Secondary Education, aged 14 to 17 years, participated. The Questionnaire on the Usability of ICT with Internet Connection (CUTIC) by Alvarado and Llopis (2017) was used as a working instrument, specifically the items and dimensions referring to the use of computers or tablets. To obtain the BMI, self-reported weight and height data of the schoolchildren were requested, calculated using the kg/m² formula (Baile & González-Calderón, 2014), taking as reference the tables of the Orbegozo foundation (Sobradillo et al., 2004). The center was informed at all times and informed consent was obtained from the parents or legal guardians of the students, and the research was carried out in accordance with the ethical requirements of the Declaration of Helsinki of 2013, using the SPSS Statistics software package, version 27.0.

Results: The average use of computers and tablets, regardless of other variables such as BMI, was lower than the use of cell phones. More than half of the adolescents studied use these screen devices at least two hours a day to consult social networks.

Conclusions: Schoolchildren make excessive use of mobile devices, especially those with obesity, who report a daily exposure to social networks of about 6 hours. In view of this situation, physical activity and sport professionals should generate and offer innovative and attractive programs that generate the necessary synergies with social networks as a tool to bring active leisure to adolescents.

Keywords: Computer, tablets, schoolchildren, body mass index

Relationship between the strength of lower body and the ability of climbing stairs with specific gear in professional firefighters



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Objective: To study the relationship between different indicators of muscle strength of the lower body and the time of climbing stairs with specific gear in a group of professional firefighters.

Method: 34 firefighters completed two experimental sessions. In the first session, they were tested on their vertical jump (CMJ)

ability, performed an incremental squat test to estimate the repetition maximum (1RM) and they completed a squat test to evaluate the average propulsive speed (MVP) before the load of the specific gear (35 kg). In the second session, the climb test was carried out on a six-story building at maximum speed wearing the specific gear. The subjects were grouped into 3 age groups (G1: 26-35 years; G2: 36-45 years; G3: ≥ 46 years).

Results: Stair climb time showed high negative correlations with CMJ jump ($r = -0.85$) and 35 kg squat MVP ($r = -0.77$), and moderate negative correlations with 1RM ($r = -0.60$). These relationships were maintained when the sample was divided into different age groups. The groups that presented higher performance on the ladder showed higher levels of performance in the strength indicators (CMJ and MVP with 35 kg).

Conclusions: The relationships observed indicate that the capacity to apply strength against low and specific loads may be a determining factor in performance in the ability of climbing stairs with specific gear in professional firefighters.

Keywords: Firefighters, Muscular Strength, Stair Climbing, Specific Gear, Professional Capacity.

Relationships between changes in muscle contractile properties and muscle hypertrophy after a strength training program



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Objective: To examine the potential relationships between changes in different muscle mechanical properties and structural adaptations following four resistance training (RT) programmes that differed in the velocity loss induced in the set.

Method: Fifty-five resistance-trained men (age, 24.1 ± 4.3 yr; height, 1.75 ± 0.06 m; body mass, 75.5 ± 9.7 kg) volunteered to take part in this study. All subjects had a training background ranging from 1.5 to 4 years (1-3 sessions per week) and were accustomed to performing the full-squat (SQ) exercise. Participants trained 8 weeks, 2 times per week SQ exercise between 70-85%1RM. The vastus lateralis (VLA) and vastus medialis (VME) muscles' contractile properties were assessed by TMG. The parameters taken into account in the TMG were: V90; V10 and Vrd. In Ultrasound: CSA, PA and FL. These parameters were measured before and after the training program. Data were analysed using an analysis of correlations. Statistical significance was established at the $P < 0.05$ level.

Results: In our study, we observed a moderate association between CSA and VME V90, V10, and Vrd ($r = 0.36; 0.41; 0.36$) and between CSA and Vrd when both muscles (VLA+ VME) were combined ($r = 0.34$).

Conclusions: The main findings of the current study were that there was a moderate association between changes in different mechanical muscle properties and muscle hypertrophy.

Keywords: Tensiomyography, Muscle contractile properties, Muscle architecture

Role of body composition status on the associations between physical fitness and depressive symptoms in adults with depression: sonrie study



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Objective: To examine the associations of muscular and cardiorespiratory fitness (CRF) with depressive symptoms in depressed adults categorized by body mass index (BMI) and fat mass percentage (FM).

Method: This study included cross-sectional baseline data from the SONRIE Study. A total of 79 individuals with low-moderate depression and aged 25 to 65 years (11 men) participated. Muscular fitness was assessed by handgrip test and CRF by 6-minutes walking test. Depressive symptoms were collected by the Beck Depression Inventory-II. BMI and fat mass percentage were obtained using a multifrequency bioimpedance. Participants were categorised as normal weight (NW) or overweight-obesity (OW) by BMI classification and FM percentage criterion according to Gallagher et al. (2000). Multiple linear regressions models were used to examine associations adjusting for sex, age, socioeconomic status, and educational level.

Results: Depressive symptoms were negatively and significantly associated to muscular and CRF after adjusting for potential confounders in those depressive adults categorized at the OW by BMI ($\beta=-0.094$ for handgrip and $\beta=-0.054$ for CRF; all $p<0.01$) and by FM ($\beta=-.007$ for handgrip and $\beta=-0.010$ for CRF; all $p<0.01$), but not at the NW by BMI ($\beta=0.221$ for handgrip, $\beta=0.470$, for CRF; all $p>0.05$) and by FM ($\beta=-0.120$ for handgrip, $\beta=0.354$, for CRF; all $p>0.05$).

Conclusions: Upper body muscular and CRF appear to be protective factors of depressive symptoms in overweight and obese depressed adults.

Keywords: Depression, Physical fitness, Body Composition, Adults.

Role of cardiorespiratory fitness on the associations between endocannabinoid system and depressive symptoms in adults diagnosed with depression: the sonrie study



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Objective: To examine the role of CRF on the possible associations between Endocannabinoid System (SE) biomarkers

(2-AG and AEA) and depressive symptoms in adults with depression.

Method: A total of 73 individuals aged 25 to 65 years (11 male) diagnosed by low-moderate depression participated. AEA and 2-AG were quantified by isotopic dilution, atmospheric pressure, liquid chromatography/chemical ionization/mass spectrometry (LC-APCI-MS). Depressive symptoms were quantified by the Beck Depression Inventory-II. CRF was assessed by 6-minutes walking test (meters) and was then categorized as low (to percentile 25) and high (from percentile 25 to 100). Linear regressions models were used to examine the associations between SE biomarkers and depressive symptoms after adjusting for potential confounders (sex, age and CRF).

Results: 2-AG was inversely associated with depressive symptoms after adjusting for sex and age ($\beta=-0.011$; 95% interval coefficient (IC): -0.0257 to 0.002; R2 0.14; $p=0.017$), yet the percentage of variance was 10% higher when CRF was added to the model ($\beta=-$; R2 0.23; $p=0.001$). This association differed by CRF groups since inverse significant associations were only found for those categorized at the high CRF ($\beta=-0.016$; 95% IC: -0.030 to 0.001; R2 0.24; $p=0.003$). No associations were found for AEA.

Conclusions: Cardiorespiratory fitness has shown to be an interacting factor in the relationship between 2-AG and depressive symptoms in patients diagnosed with depression. These results suggest that CRF could have a protective role on depressive symptoms by means of increases in 2-AG.

Keywords: Depressive disorder, Adults, Endocannabinoid system, Cardiorespiratory fitness.

Social media perceptions among sport management students



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Objective: Social media are becoming increasingly important in society and the professional field of the sports industry. The main objective of this study is to explore the perceptions of sport management students about social media after having used LinkedIn in classroom dynamics.

Method: Sixty-one sport management students from the University of Valencia participated in this study in 2020-2021. 80.30% were men, while 19.70% were women, with a mean age of 21.69 (SD=2.34) years. The questionnaire created by López-Carril et al. (2021) was administered online through the LimeSurvey platform at the beginning of the course (pre-test) and the end (post-test).

Results: Students' perceptions of social media use in class were positive, as they exceeded five points on a six-point ascending Likert scale in the post-test. The dimension where significant positive differences were obtained between the pre-test and the post-test was: "Social media as a university teaching-learning tool".

Conclusions: It can be concluded that sport management students positively perceive social media use in sport management classes. Above all, students highlight its usefulness as a teaching-learning tool at university.

Keywords: Social media, LinkedIn, Sport Management Education, Higher Education.

The WhatsApp as a formal communication channel for COVID-19 data; an experience among medical community of Pakistan.



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Objectives: 1. To assess the social networking services usage among healthcare professionals for formal communication. 2. To explore the determinants of utilizing WhatsApp for COVID-19 data sharing

Method: In this quantitative descriptive cross-sectional study, 20 items structured questionnaire has been distributed online among 880 healthcare workers (physicians, nurses and technologists) in randomly selected 35 health facilities of Pakistan, from January 15 to July 15, 2021 with 90% response rate. The questionnaire included the demographical information, most frequently used platform for COVID-19 health information, reasons of choosing WhatsApp for data sharing, advantages and disadvantages of WhatsApp etc. The statistical analysis was accomplished utilizing Epi Info version-7.

Results: Total 792 healthcare professionals participated in this survey. The mean age was 31 years with range of 18–60 years. The male to female ratio was 1:2. Almost 96% participants were familiar with SNSs and 93% were actively using WhatsApp. The being physician (48%), female gender (72%), 24 hours availability (83%), easy access through mobile (88%), user friendly (91%), flexibility in modification (78%), trust on service (81%), privacy and confidentiality (87%), suggested officially by the authorities (89%) were the main determinants of WhatsApp usage. On the other hand purchasing an Android high-tech mobile and cost of internet service were the main hindrances for healthcare professionals.

Conclusions: The WhatsApp usage among healthcare professionals is higher than expected regarding COVID-19 data sharing. Thus, authorities should focus on utilizing WhatsApp as an official platform to get maximum benefits in health sector. Moreover, cost of mobile devices and internet packages should be low for healthcare professionals in Pakistan during COVID-19 pandemic.

Keywords: Social Networking Services, WhatsApp, Formal Communication, Medical Community, COVID-19, Pakistan.

Cell phone use among secondary school students. Analysis according to gender, age and BMI



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Objective: This research aims to study the connection between the use of cell phones and sex, body mass index and level of PA practice in adolescent schoolchildren.

Method: This is a cross-sectional descriptive study conducted with a total sample of 103 students in compulsory secondary education (ESO), aged between 14 and 17 years. The Questionnaire on the Usability of ICT with Internet Connection (CUTIC) was used, specifically the questions related to the use of cell phones (Jiménez, Alvarado, & Llopis, 2017). BMI was obtained self-reported and applying the kg/m² formula (Baile & González-Calderón, 2014), classifying the schoolchildren with the Orbeagoz foundation tables (Sobradillo et al., 2004). The level of Physical Activity of the sample was assessed with the WHO Global Physical Activity Questionnaire (GPAQ) (2014). Informed consent of the

parents or legal guardians was provided throughout the procedure and adjusted everything to the Helsinki Declaration of 2013. Descriptive and ANOVA analyses were performed with SPSS Statistics software version 27.0.

Results: For the schoolchildren in this study, cell phones are the most commonly used screen devices, with boys being the ones who use them the most. There seems to be more consensus on the fact that the main reason for the use of these screen devices is related to the consultation of social networks. In relation to BMI, the group of schoolchildren with obesity spends too much time on social networks, compared to those with normal weight and overweight.

Conclusions: The main conclusion is that cell phones are widely used by the adolescents studied, especially to consult social networks. Excess weight is related to prolonged periods of use of these devices. Boys report a greater use of these mobile devices for educational purposes.

Keywords: Smartphone, Adolescence, Sex, Weight status.

Evaluation of the acute response after a stair climbing exercise with specific gear on different mechanical, physiological and metabolic variables in professional firefighters



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Objectives: To analyze the acute effects on different mechanical, metabolic and physiological variables when performing a stair climbing test with specific gear in a group of professional firefighters.

Methods: 34 firefighters completed an exercise of climbing stairs to a six-story building at maximum speed with specific gear. Before and after the test, they were evaluated of vertical jump capacity (CMJ) and they completed a squat test to evaluate the mean propulsive speed (MVP) to the load of the specific gear (35 kg). Physiological variables were analyzed (O₂ saturation & heart rate) and metabolic (blood lactate). The subjects were grouped into 3 age groups (G1: 26-35 years; G2: 36-45 years; G3: ≥ 46 years).

Results: A significant loss was observed ($p < 0.001$) after the stair climbing in the CMJ jump and in the 35 kg squat MVP with respect to the initial analysis. There was also a significant increase ($p < 0.001$) in blood lactate concentration and heart rate. Significant differences ($p < 0.05$) were found between age groups in the CMJ jump and, only in G2, in the 35 kg squat MVP.

Conclusions: The acute response induced after a stair-climbing exercise with specific gear seems to show a significant deterioration in the performance of the variables studied. It is, therefore, an exercise that causes significant fatigue and that considerably involves the metabolic pathways that depend fundamentally on glycolysis.

Keywords: Firefighters, Muscular strength, Stair climbing, Specific gear, Professional capacity.

Circulating leptin levels are associated with fat oxidation and insulin resistance in healthy young adults

CrossMark

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Objective: To investigate the associations between leptin levels with resting fat oxidation (RFO), maximal fat oxidation (MFO) during exercise and insulin sensitivity.

Method: A total of 62 apparently healthy young adults (35% females; 22.37 ± 4.20 years; Body Mass Index = 25.22 ± 4.66 kg · m⁻²) participated in this cross-sectional study. Fasting glucose, insulin and leptin were analysed in plasma. Different variables related to insulin resistance (HOMA1-IR, HOMA2-IR and HOMA-β) and sensitivity (QUICKI) were calculated. Body composition and anthropometry measurements were also taken. RFO and MFO were determined by indirect calorimetry with a gas analyzer, using an Exercise protocol of 3-minute steps in a cycle ergometer (Achten et al., 2002) for MFO. Maximal oxygen uptake (VO₂max) test was performed until exhaustion after MFO test. MFO was relativized to total body mass (MFO-BM) and total lean mass (MFO-TLM).

Results: Circulating leptin levels were positively associated to RFO ($\beta = 0.330$; $R^2 = 0.114$; $p = 0.037$) and HOMA- β ($\beta = 0.334$; $R^2 = 0.079$; $p = 0.033$) when adjusted for age and sex. Nonetheless, circulating leptin was negatively associated to MFO-BM ($\beta = -0.344$; $R^2 = 0.118$; $p = 0.006$), even adjusting for age and sex ($\beta = -0.292$; $R^2 = 0.269$; $p = 0.042$). However, when adjusted for VO₂max, leptin was positively associated to MFO-BM ($\beta = 0.350$; $R^2 = 0.639$; $p = 0.002$) and MFO-TLM ($\beta = 0.517$; $R^2 = 0.523$; $p < 0.001$).

Conclusions: Circulating leptin levels are associated with RFO, MFO and insulin resistance. Moreover, VO₂max could exert a mediating effect on the relationship between leptin and MFO, so more studies are needed. Likewise, this study suggests that MFO, determined by indirect calorimetry technology, is an important variable to take into account in the fields of health and sports performance.

Keywords: Adipocytokines; Fatty acid oxidation, Obesity, Insulin sensitivity, Cardiometabolic risk, Exercise.

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