

ABSTRACTS OF PRESENTATIONS AND SCIENTIFIC POSTERS

Students' CongreSS of Science and Sport in Split (ST-CongreSS) University of Split, Croatia 8–10 May 2024

ORAL PRESENTATIONS

01.

MOTHERHOOD PENALTY AND FATHERHOOD BONUS? USING DATA DIFFRACTION TO ANALYSE FINDINGS FROM A MIXED METHOD RESEARCH STUDY

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Aims: The objective of this research study is to find out whether there exist any junctures that prove to be detrimental to the University of Malta staff being academic, managerial, administrative, technical and industrial, specifically to those who partake family-friendly measures. These may be the root cause to the motherhood penalty that many women in many organisations are confronting on becoming mothers.

Methods: This research study will adopt a triangulation mixed method approach which is debated by many but offers solutions when gaps in information presented by one method may be addressed by the other. The triangulation research method involves textual analysis which will be able to construct both a survey and an interview guide. Quantitative data will give percentages while the qualitative will give interpretations. All the findings from the three methods will be entangled and analysed through data diffraction. We assume that mixed methods in this research is possible and although they produce “cuts” that may not always cohere, can be successfully explained and analysed through diffraction. This is because “diffraction pays attention to the ways in which data produced through different methods can both splinter and interrupt the object of study. As such, it provides an explicit way of empirically capturing the mess and complexity intrinsic to the ontology of the social entity being studied” (Uprichard and Dawney, 2019, p.19).

Results: Data diffraction will be able to respond to the details and specifications of the relations and importance within their difference. While the metaphor of reflection reflects on the sameness of texts, diffraction illustrates the patterns of difference.

Conclusions: It is important to keep in mind that when the research conclusions depend only upon the researchers' point of view, it raises questions about biases of the researchers' themselves.

02.

THE PREVALENCE OF ANXIETY AND DEPRESSION AMONG UNIVERSITY OF SPLIT SCHOOL OF MEDICINE STUDENTS: A CROSS-SECTIONAL STUDY

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Aims: This study aimed to investigate the mental health of medical students by conducting a survey to assess levels of depression, anxiety, and coping strategies. Additionally, it analyzed demographics, lifestyle variables, and other potential stressors to identify students who may be particularly vulnerable.

Methods: Participants were medical students enrolled at the University of Split School of Medicine, spanning all six years of the program. The assessment included the Patient Health Questionnaire-9 (PHQ-9) for depression and the General Anxiety Disorder-7 (GAD-7) questionnaire for anxiety. The Brief Resilient Coping Scale (BRCS) was used to measure an individual's ability to cope with stress.

Results: The study's key finding is the elevated levels of depression and anxiety among participants, aligning with findings from similar studies. Out of 545 enrolled students, 353 (65%) completed the survey. The mean score for depressive symptoms, as determined by the PHQ-9, was 7.6 (standard deviation ± 5.6). Of these, 37 students (10%) scored 15 or higher, indicative of severe depression, while 67 students (19%) scored between 10 and 14, indicating moderate depression. The mean score for anxiety symptoms, measured by the GAD-7, was 6.7 (± 5.2), with 44 students (12.5%) scoring 15 or above, suggesting severe anxiety, and 43 students (12%) exhibiting moderate anxiety levels. The BRCS scores showed that 104 (29.5%) belong to the category of low resilient copers.

Conclusions: The prevalence of depression and anxiety among the medical students in this study exceeds that of the general population, highlighting the critical need for interventions to safeguard their mental health.

03.

ASSOCIATION BETWEEN TEAM PERFORMANCE AND LEADERSHIP STYLE OF COACHES IN THE FIRST DIVISION OF CROATIAN FOOTBALL FOR WOMEN

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Background: Football is a team sport that requires connection and good harmony in technical and tactical aspects between every member of the team and their coaches. Lately, women's football has begun to develop and it is being studied more. It is observed that there are differences in the coaching style of men's and women's clubs.

Purpose: The aim of this study was to determine associations between team effectiveness and leadership style of coaches.

Methods: Participants in this study were women senior players in the first division of Croatian football (N=87). The study included leadership style variables (training and instructions, democratic behaviour, autocratic behaviour, social support and positive feedback) determined by the LSS (Leadership Scale for Sport) questionnaire and team performance determined by team ranking and points at the end of the first half-season. Non-parametric correlation analysis was used to determine the level of association between observed parameters.

Results: Results indicated that high-ranking teams have coaches with more democratic styles, as shown by the weak correlation with both parameters, points achieved ($\rho=0.28$) and team ranking ($\rho=-0.25$). Also, coaches of these teams provide more information ($\rho=0.26$) and positive feedback ($\rho=0.27$) to players.

Conclusion: It is possible that these results are related to the greater sensibility of women. Because of that, they love coaches with more empathy and understanding which can lead to enhanced performance. Coaching female football players require more attention, instructions and individual communication. In future studies, larger number of individual and team performance should be included to gain more information of relation between leadership styles and players efficiency.

04.

SLEEP QUALITY IN U17 CROATIAN NATIONAL WATER POLO TEAM PLAYERS

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Aim: Sleep is crucial for recovery and performance capacity in elite athletes. Therefore, the main aim of this study was to assess sleep quality in youth water polo players before the high-stress quarter-final match during the European Championships and to compare it with the sleep quality during the period of pre-tournament preparation.

Methods: There were 10 female and 12 male youth water polo players included in this cross-sectional study. All of them were members of U17 Croatian National Water Polo teams participating at the LEN European Junior Water Polo Championships 2021. The Sleep Hygiene Index (SHI) was used to assess practices and behaviours related to sleep hygiene and the Groningen Sleep Quality Scale (GSQS) to measure subjective sleep quality. Both questionnaires were self-administered to the participants through the Google Forms in two different time points – during period of pre-tournament preparation and night after the quarter-final game.

Results: Mean age of the participants was 16.27 ± 0.75 years, with no statistically significant difference between girls and boys. The mean GSQS score was 4.18 ± 2.99 during the period of pre-tournament preparation and 1.82 ± 2.22 night after the quarter-final game ($P=0.008$) indicating better sleep quality after the most stressful game of the tournament was finished, although they had lost. The mean SHI overall score was 32.14 ± 4.13 during period of pre-tournament preparation compared to 30.54 ± 4.72 night after the quarter-final game ($P=0.114$) indicating acceptable sleep hygiene status of youth water polo players in both time points of the season.

Conclusions: The current study showed that youth water polo players had impaired sleep quality during the period of pre-tournament preparation. General sleep hygiene of youth water polo players appeared to be adequate overall, but adjustments with respect to specific behaviours may help to further optimize sleep in elite athletes.

05. FOOTBALL TEAMS RUNNING PERFORMANCE BY QUALITY LEVEL AT FIFA WORLD CUP 2022

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Purpose: The main objective of this study was to examine position-specific running performance differences among three quality categories based on the FIFA Men's World Ranking during the 2022 Qatar FIFA World Cup matches.

Methods: Fifty-nine matches played without extra time were analysed (n=642 player observations). Players were classified by their playing position as central backs (CB), full-backs (FB), defensive midfielders (DM), central midfielders (CM), wide midfielders (WM) and forwards (FW). Video analysis was used to assess total distance covered (m) just remove (m), Zone 1 running (0-7 km/h) (0 – 7 km/h), Zone 2 running (7-15 km/h) (7 – 15 km/h), Zone 3 running (15-20 km/h) (15 – 20 km/h), Zone 4 running (20-25 km/h) (20 – 25 km/h), Zone 5 running (>25 km/h) (> 25 km/h), number of high-speed runs (runs in Zone 4), number of sprints (runs in Zone 5) and top speed achieved. Cluster analysis was used for grouping the teams into three quality categories according to the FIFA Men's World Ranking.

Results: ANOVA variance estimation showed statistically significant position-specific RP differences amongst quality categories. Results indicated that CM differ in total distance covered, CB and WM in Zone 1 running, CM and WM in Zone 2 running, CM and FW in Zone 3 running, CM in Zone 4 running, CB and WM in Zone 5 running, CM and FW in the number of high-speed runs, CB and DM in the number of sprints, FB and FW in top speed achieved.

Conclusion: CM of middle-range quality teams covered the most total distance. In almost all positions, players from middle-range quality teams lead in high-intensity running indicators, except WM and FW. WM of the highest quality teams covered the greatest distance in sprinting, the reason may be in the tactical settings and players'

positional characteristics. FW of lowest-ranked quality teams had the highest number of high-speed runs, probably due to defensive positioning closer to their half of the pitch. Players from the highest-quality teams generally didn't run more than others in total distance. They also didn't run more in high-intensity running zones than others, except in one position. WM of the highest quality teams covered the greatest distance in sprinting probably due to tactical settings and players' positional characteristics. FB, DM, and CM from middle-range quality teams lead in high-intensity running indicators. CM of middle-range quality teams also covered the greatest total distance. CBs from the lowest quality teams ran the most distance in the highest-speed running zone together with their FWs with the highest number of high-speed runs, which can be explained by defensive playing style and positioning.

POSTER PRESENTATIONS

PP1.

MUSCLE OXYGENATION DIFFERENCES IN FREEDIVERS DURING WINGATE TEST

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Background: Breath-hold diving is an anaerobic activity in which athletes endure 4 or more minutes of apnea. The muscle oxygenation and anaerobic abilities play a pivotal role in the performance of divers.

Aims: This study aimed to determine the differences in local muscle oxygenation between the lower limb muscles of spearfishermen and freedivers.

Methods: The sample of participants included 17 male athletes (9 free divers, and 8 spearfishermen). Their chronological age was 37.00 ± 8.82 years, body mass 82.48 ± 9.47 kg, and height 184.18 ± 5.66 cm. Participants' training experience was 10.65 ± 9.47 years. Anthropometric characteristics included: body mass, body height, percentage of body fat, muscle mass percentage, and leg muscle percentage. Wingate anaerobic test was conducted, during which local muscle oxygenation was measured with a NIRS device (Moxy monitor) in the vastus lateralis and gastrocnemius muscles. Wingate power outputs were measured (peak power (W/kg) and average power (W/kg)), together with muscle oxygenation variables (baseline SmO_2 (%), desaturation slope (%/s), minimum SmO_2 (%), halftime recovery (sec), and maximum SmO_2 (%)).

Results: The analysis of results demonstrates significant differences in baseline SmO_2 ($p=0.03$), where gastrocnemius shows smaller values ($59.12 \pm 9.00\%$) than vastus lateralis (65.24 ± 8.73). Similarly, gastrocnemius demonstrates smaller values in SmO_2 max ($66.97 \pm 10.91\%$) than vastus lateralis ($78.49 \pm 4.88\%$). Regarding the correlations, the only significant correlation is between body height and gastrocnemius SmO_2 (-0.53). Other variables do not show a significant relation.

Conclusions: The results of this study demonstrate that BHD athletes have significant differences between measured muscles in oxygenation parameters. These findings suggest that different muscles use oxygen due to the demands of the test. Since there were no significant correlations between anthropometric indices, except body height, and oxygenation of muscles the differences could be observed as the workload of muscles. Also, the relation of body height with gastrocnemius SmO_2 max determines that shorter muscles reoxygenation to the higher level.

PP2.

CORRELATION BETWEEN TGMD-2'S ASSESSMENT AND SOME MOTOR ABILITIES

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Aims: Fundamental gross motor behaviors, usually developed in preschool and elementary years, provide a multifaceted background for later sport-specific movements. The Test of Gross Motor Development provides the assessment of two major movement categories, including locomotor skills and object control skills. Hence, there is a need to establish the possible impact of motor skills in executing basic motor abilities. Following, this study aimed to determine the correlation between TGMD's locomotor skills and some motor abilities.

Methods: This study included 13 preschool and elementary children, aged 6.69 ± 1.11 years (body mass of 26.45 ± 5.85 kg, body height 126.44 ± 10.28). Observed variables included motor abilities (agility (triangle blaze pod test), long jump, 20m sprint (photo-cells), balance) and TGMD-2' locomotor skills (run, horizontal jump, hopping, gallop, leap, slide). The tests were executed 2 times, 11 weeks apart. Pearson's correlation was used to determine the relation between TGMD-2 and motor abilities. The t-test determined differences between initial and final assessment.

Results: The analysis of results demonstrates no significant correlation between TGMD-2 and motor abilities, in both initial and final assessment. Furthermore, long jump (initial, 115.17 ± 19.50 cm; final, 126.33 ± 18.21 cm) and TGMD-2' results (initial, 4.31 ± 2.06 ; final, 9.85 ± 2.54) showed significant differences between assessments. Additionally, correlations between assessments showed significance between long jump ($r=0.88$), 20m sprint ($r=0.77$), and balance ($r=0.68$).

Conclusions: The main finding of this study is the lack of correlation between motor skills and abilities. Such results can be interpreted with an increase in skills and abilities. Precisely, results of initial testing indicate lower scores in tests. Even though that final assessment results showed an increase in all variables, the lack of correlations persists. This leads to a conclusion that acquisition of higher level of locomotor skills is not influential on motor abilities, and vice versa. Finally, the linear increase in motor abilities is not present in locomotor skills.

PP3.

INVESTIGATION OF THE EFFECT OF PESTICIDES COMMONLY USED AND ABUSED IN MALTA ON THE PROTEOMIC LANDSCAPE OF THE COLON LINING AND THEIR ROLE IN THE DEVELOPMENT AND PROGRESSION OF COLORECTAL CANCER

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Agriculture relies on high amounts of pesticides to increase crop production and maintain high-quality products. In 2020, Malta recorded the highest average of pesticides sought by sample (474 pesticides) out of all EU member countries. The main route of pesticide exposure in the general population is through contaminated food or water sources. There are numerous health effects associated with pesticide ex-

posure, one of which is cancer. Most studies investigating the link between pesticides and disease focus on acute exposure, epidemiological studies or toxic effects in animal models. However, the effects of prolonged low-dose pesticide exposure on the molecular biology and biochemistry of cancer initiation and progression are only highlighted in a limited number of studies. Colorectal cancer (CRC) is the third most diagnosed cancer in Malta. More than half (55%) of CRC cases are attributed to lifestyle and environment including the diet. This study aims to investigate the impact of five commonly used and sometimes abused pesticides in Malta between the period of 2019 to 2024 on the phenotype and biochemistry of CRC. One of these pesticides is chlorpyrifos. This project is still in its early stages and currently, we are working on establishing a working concentration of chlorpyrifos on three CRC cell lines (HCT-116, Caco-2 and DLD-1) and one healthy colon cell line (CCD 841) through cell viability assays. The selected dose will be used to treat the cells in culture for some time before investigating any changes in migration, invasion, cell cycle progression, protein expression and response to 5-fluorouracil (a therapeutic agent commonly used to treat CRC). We hypothesise that pesticide exposure will induce proliferation, migration and invasion by modulating the expression of markers involved in inflammation, proliferation, metabolism and drug transport.

PP4.

PHYSICAL PROFILE OF YOUTH FUTSAL PLAYERS – IDENTIFYING QUALITATIVE-RELATED DIFFERENCES

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Background: Futsal is a highly complex sport defined by high-intensity intermittent activities, constituted by repeated intense efforts which require a high level of physical abilities from players. However, there is a lack of studies regarding physical profile of youth futsal players.

Aim: The aim of this study was to identify quality-related differences in the physical profile of under-13 (U13) futsal players from Croatia.

Methods: Total of 14 U13 futsal players were divided into two quality groups by head coach, advanced (A) (n=9) and non-advanced (B) (n=5) groups. Participants performed 12 motor tests: Sprint 20 m (S20M); Sprint 5 m (S5M); Sprint 30 m (S30M); Sprint 10 m (S10M); Counter Movement Jump (CMJ); Squat Jump (SJ); Drop Jump (DJ); Reactive Strength Index (RSI); Shoot Left Foot (SHOOT L); Shoot Right Foot (SHOOT R); 20 Yards Agility Test (20Y); Triangle Reactive Agility Test (T RAG). Parameters of descriptive statistics were calculated, and T-test was used to identify differences between groups.

Results: Statistically significant differences between observed groups were found for S20M ($P=0.013$), S5M ($P=0.023$), S30M ($P=0.042$), and SHOOT R ($P=0.018$).

Conclusion: These findings show that in the U13 age group, futsal coaches prefer choosing faster players and the one's with higher level of power, manifested in sprinting and shooting. This indicates that success in youth futsal depends significantly on the level of development of these motor abilities and that their development should begin at this age. In future studies larger sample should be included with broader range of predictors in order to get a clearer picture regarding profile of youth futsal players.

PP5.

ASSOCIATION BETWEEN CERTAIN PSYCHOLOGICAL AND HORMONAL VARIABLES IN COMPETITIVE ENVIRONMENT OF A ROWING ERGOMETER RACE

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Background: Rowing is an Olympic sport performed both collectively and individually on water surfaces, characterized by specific cyclic movement that is repeated during the race. High intensity rowing puts both physical and psychological stress on the athletes

Purpose: The aim of this study was to determine possible associations between some psychological parameters and dynamic hormonal responses of salivary cortisol hormone and alpha amylase enzyme.

Methods: Participants in this study were male junior and senior level rowers of HVK Gusar Split competing both on club and international level (N=12). Study included psychological variables (cognitive state anxiety, somatic state anxiety and self-confidence) determined by CSAI 2 questionnaire and hormonal variables determined by three repeated measures of cortisol and alpha amylase (baseline level, post warm up level and post-race level) using oral swabs. Research was conducted as a part of early season physical testing on 6000 meters which generated high motivation levels among the athletes. Pearson correlation analysis was used to determine level of association between observed parameters.

Results: Results indicated high levels of negative correlation ($r=-0,61$) between baseline level of alpha amylase and self-confidence variables.

Conclusion: It is possible that individuals with high levels of self-esteem experienced lower levels of hormonal stress before the race, resulting in lower alpha amylase enzyme levels. Since only correlation analysis was used, we can't do more than assess there is association between the two variables. Practically, this association shouldn't be neglected when it comes to optimising sport's performance since increasing self-confidence can influence the quality of hormonal status before the race.

PP6.

ARE THERE ANY DIFFERENCES IN THE PHYSICAL CAPABILITIES AMONG THE INJURED AND NON-INJURED ELITE U19 FOOTBALL PLAYERS?

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Background: Injury incidence in youth football increases with age, reaching peak values in the oldest age groups. To reach and eventually succeed at the senior level, the players are exposed to high football-specific loads that in turn predispose them to an elevated injury risk. To mitigate the injury risk, a wide range of pre-season testing procedures is used to identify the level of relevant physical abilities.

Purpose: The main aim of the study is to analyze the differences in the anthropometric, motor and functional capacities between the group of players that suffered

an injury and the group that did not sustain any injury during the observed period. **METHODS:** 25 elite football players of the U19 category were analyzed. Variables in this study included a set of anthropometric (body height and mass), motor (strength and power-speed capacities), and functional parameters (30-15 IFT). All players were observed during the first half-season of 2023/2024 and were classified either as (i) injured or (ii) non-injured players. An injury was defined as any physical complaint that resulted in a time-loss from football exposure. Non-parametric Mann-Whitney U test was used to evaluate the differences in the motor-functional performance between the groups.

Results: The results indicated there was no significant difference in the pre-season physical testing between the uninjured players and the players that sustained an injury later in the season (all $p > 0.05$).

Conclusion: The player performance in the pre-season testing procedures did not significantly differ between the two groups. Thus, here stated procedures cannot be used to determine the players at risk for an upcoming injury. Moreover, the inclusion of objective mobility and stability assessment of the muscle-joint system is required. Pre-season testing should consist of comprehensive and time-effective strategies that would enable the creation of precise injury risk profiles.

PP7.

RELATION AMONG PEAK HIGH VELOCITY, ANTHROPOMETRIC INDICES, AND MOTORIC ABILITIES IN YOUTH SWIMMERS

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Aims: This study aims to determine the relation among peak height velocity, anthropometric indices, and motoric abilities in youth swimmers.

Methods: The sample of participants included 15 male swimmers. Their chronological age was 9.71 ± 0.99 years. Used variables were age, PHV, maturity offset, body height, seating height, body mass, leg length, 25m freestyle, medicine ball throw, sit-ups, and 20m sprint run.

Results: Results that showed more significant differences were: medicine ball throw compared to body height; taller kids threw the ball further. Sit-ups compared with body mass; kids with lower body mass did more sit-ups. 20m sprint compared by age, older kids run faster. PHV compared with age and body height, and Maturity offset compared by age and body height; if the kid is older or taller it has reached a bigger maturity offset and PHV. These variables showed bigger deviations and have a reason why. Body height, body mass, and age are very important at a young age and can make a big difference in a young athlete's performance. Coordination, strength, and speed at ages 8 to 11 have linear growth in progress.

Conclusions: Bigger differences which were shown in the results can be explained by sensible phases of child motor development. We didn't see a significant change in any variables connected with the 25m swim, kids start to develop motor skills on the ground and at an early age. New media such as water takes a different set of motor skills to be used. This means that younger kids can have better results if they have more training experience than their older colleagues because their specific coordination, strength, and speed are used more efficiently in water. This is why we say that swimming is a sport of early selection.

PP8.

ANALYSIS OF SITUATIONAL EFFICIENCY PARAMETERS BETWEEN MORE SUCCESSFUL AND LESS SUCCESSFUL TEAMS IN THE UEFA CHAMPIONS LEAGUE 2017-18

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Aim: The main goal of this research was to determine the differences in some parameters of situational efficiency between teams that passed (N=16) and those that did not pass (N=16) the group stage of the Uefa Champions League in the competitive season 2017/2018.

Methods: Using UEFA's official website, parameters of the situational efficiency (N=18) of the 96 matches of Champions League 2017-18 group stage were assessed.

Results: Student's T-test showed significant differences in 9 out of 18 variables of situational effectiveness between teams that passed the group and teams that did not pass the group (GS-goals scored, CG- conceded goals, AS-average number of shots, AST- average shots on target COR- number of corners, POSS (%)-percentage of possession, AP (%)- percentage of accurate passes, AAP-average number of accurate passes, T-tackles). Teams that advanced past the group stage had better overall performance in variables average number of shots and average shots on target compared to the teams that didn't advance (15.01, 6.98 vs. 10.96, 3.35, respectively). Also, teams that advanced had overall better average ball possession and passing accuracy (53.94% / 85.82% vs. 46.28% / 82.43%). There were no significant differences in variables of defensive efficiency except for the variable tackles where teams that advanced had lesser number of tackles (22.81 vs. 31.5, respectively).

Conclusion: Situational efficiency in football could provide coaches and scientists with valuable data regarding match success. For the 2017-18 Champions league season, it seems that offense variable like shooting, ball possession and passing accuracy were more decisive than defense.

PP9.

COMPARISON OF GOALKEEPERS' MATCH PERFORMANCE IN THE GROUP AND KNOCKOUT STAGE MATCHES OF THE UEFA CHAMPIONS LEAGUE

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This study aimed to compare MP (match performance) in the group and knockout stage matches among top-elite football goalkeepers. The goalkeepers' MPs (n=242) were collected during the group (n=94) and knockout stage matches (n=29) of the UEFA Champions League (UCL) in the 2022/23 season. The MPs included running performance (RP) and technical performance (TP). The RPs were collected using an optical tracking system (Player & Ball Tracking System, Hawk-Eye Innovations Limited, Basingstoke, England), and variables included total distance, low-intensity running, moderate-intensity running, high-speed running, and sprinting distances. The TPs were collected using the WyScout® tracing system (Wyscout Spa, Chiavari, Italy), and variables included total passes, accurate passes, passes beyond own third, ac-

curate passes beyond own third, conceded goals, saves, and reflex saves. Depending on the normality of the distributions, which was tested using the Kolmogorov–Smirnov test, ANOVA or Kruskal-Wallis were used to compare goalkeepers' MPs according to the phase of the competition (i.e., group and knockout stages). Cohen's *d* was used to identify effect sizes. The results indicated that goalkeepers achieved greater sprinting distance ($H=7.03$; $P<0.01$; $d=0.28$) and conceded less goals ($H=4.65$; $P=0.03$; $d=0.28$) in the knockout stage compared to the group stage matches. Total distance, low-, moderate, and high-speed running distances as well as total and accurate passes, total and accurate passes beyond own third, saves and reflex saves were similar irrespective of playing in the group or knockout stage (all *P* values > 0.05). These findings suggest that top-level goalkeepers' MPs did not greatly vary in different competition phases. Therefore, the training process of goalkeepers involved in high-level football competitions should be designed to enable them stable MPs during the whole competitive season.

PP10.

DYNAMICS OF CHANGES IN INDIVIDUAL PHYSIOLOGICAL PARAMETERS DURING THE PERFORMANCE OF A SPECIFIC TEST IN SOCCER PLAYERS

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The primary goal of this study was to examine the dynamics of changes in heart rate, maximum oxygen uptake, and lactate concentrations during a specific soccer test. This test, designed to simulate game-like intensity and movements, was structured into three rounds, each consisting of five repetitions with rest intervals between rounds. The study involved 12 soccer players (22.9 ± 1.8 years, 181.8 ± 5.5 cm body weight, body weight 76.5 ± 5.5 kg) from University team. The results from the ANOVA showed statistically significant differences within all the measured physiological parameters across the three rounds of the soccer-specific test. Notably, the heart rate and VO_{2max} displayed consistent changes, with heart rates increasing ($P<0.01$, $\eta^2=0.797$) and VO_{2max} decreasing ($P<0.01$, $\eta^2=0.804$) throughout the rounds. Lactate levels also varied significantly, increasing in the second round and then decreasing in the third ($P=0.04$, $\eta^2=0.257$), suggesting a physiological adaptation to the repeated bouts of high-intensity exercise. These findings highlight the need for monitoring these specific physiological responses to optimize training and recovery strategies effectively. By understanding how athletes' heart rates, oxygen uptake, and lactate concentrations change in response to game-like conditions, coaches and sports scientists can better tailor fitness programs to enhance both performance and recovery, ultimately helping to prevent overtraining and fatigue.

POSTER WALK

PW1.

TRANSCRIPTOMIC EXPRESSION OF FIVE GENETIC SIGNATURES IN THE METASTASES AND PRIMARY SITE OF MELANOMA

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Aims: Melanoma is cancer of pigment producing cells in skin called melanocytes. There is still a lot that is unknown about the biology of melanoma. The risk for melanoma had now reached 1:50 in Western populations, with it being the fifth most common cancer in men and sixth most common cancer in women in the USA. Studies, so far, have shown that metastasis might be quite different from primary tumors. The aim of this study is to compare five genetic signatures of biological processes that are important in cancer therapy and prognosis in primary tumor and metastases.

Methods: We searched the Gene Expression Omnibus database for melanoma samples of primary tumors and metastasis, along with their associated transcriptome data. We measured the expression of genetic pathways using the ssGSEA method on the GenePattern platform.

Results: Metastases had median expression of proliferation signature at 84% (IQR 52%-120%) of the value of the primary tumor ($p=0.75$). Genetic signature that characterizes response to xenobiotics was on average 1.12 times (IQR 0.91-1.36) higher in metastasis than in primary tumors ($p=0.06$). The median of genetic signature for DNA repair was 1.68 times higher (IQR 1.44-1.87) in metastasis than in primary tumors ($p=0.0001$). Expression of melanocyte differentiation genetic signature was at 92% (IQR 68%-118%) of that in the primary tumor ($p=0.36$). Genetic signature for apoptosis was 2.4 times (IQR 1.42-3.2) higher in metastases than in primary tumors ($p=0.0001$).

Conclusions: At the transcriptional level the biological processes of DNA repair, response to xenobiotics and apoptosis are more expressed in metastasis than in primary tumors.

PW2.

LINGUISTIC ANALYSIS OF PLAIN LANGUAGE SUMMARIES AND CORRESPONDING SCIENTIFIC SUMMARIES OF COCHRANE SYSTEMATIC REVIEWS ABOUT ONCOLOGY INTERVENTIONS

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Background: Cochrane plain language summaries (PLSs) are an important format to present high-quality healthcare evidence to patients with cancer and their families. They should be written in a way everyone can understand, since they serve as a tool in decision-making and present a bridge to overcome the gap between the healthcare users and professionals.

Aims: The aim of the study was to assess the language characteristics of PLSs of Cochrane systematic reviews of oncology interventions in comparison with corresponding Cochrane scientific abstracts (SAs).

Methods: In this cross-sectional study, we included all Cochrane PLSs and SAs of systematic reviews of oncology interventions available in the Cochrane Database of Systematic Reviews. We assessed text readability, measured using the Simple Measure of Gobbledygook (SMOG) index, and the prevalence of words related to different language tones (clout, authenticity, emotions and analytical tones). Two independent assessors categorized the conclusiveness of the efficacy of interventions into nine categories.

Results: The overall median SMOG index for 275 PLSs was 13.0 (95% confidence interval [CI] 12.8-13.3). Readability scores did not differ across Cochrane Review Groups. SAs had a higher readability index than the corresponding PLSs (median=16.6, 95% CI=16.4-16.8). Regarding linguistic characteristics, PLSs were shorter than SAs, with less use of analytical tone, but more use of a positive emotional tone and authenticity. Overall, the “Unclear” category of conclusiveness was the most common among all PLSs.

Conclusion: PLSs of Cochrane systematic reviews of oncological interventions have low readability and most give unclear conclusions about the efficacy of interventions. PLSs should be simplified so that patients and their families can benefit from appropriate health information on evidence synthesis. Further research is needed into reasons for unclear language to describe evidence from oncology trials.

PW3.

UKRAINIAN SCIENTISTS' PERCEPTIONS ON PUBLISHING WAR-RELATED EXPERIENCES: A SEMI-QUALITATIVE STUDY

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Aims: This study explored the attitudes of Ukrainian scientists participating in the Giving Voice project towards publishing in international peer-reviewed journals and identified the principal barriers they encounter in study planning and the publication process.

Methods: We adopted a semi-qualitative research approach, using semi-structured interviews and online surveys with Ukrainian scientists involved in the Giving Voice Project. The Giving Voice Project, established through the Translational Research in Medicine – TRIBE postgraduate program, aims to assist Ukrainian scientists in publishing their war-related experiences.

Results: The findings revealed a generally positive attitude among participants towards publishing in international journals. However, the primary barriers encountered during the first year of the war included diminished motivation and the prioritization of more pressing issues. A significant obstacle was also identified as a lack of expertise in research methodology and statistical analysis.

Conclusions: Identifying the key factors that hinder the publication efforts of Ukrainian scientists provides clear directions for overcoming these obstacles and highlights the necessity for specially tailored training programs for those dedicated to contributing to global scientific knowledge despite ongoing challenges. Courses

aimed at improving knowledge of research methodology, statistical analysis, and the publication process could greatly enhance their scientific output. Additionally, implementing support mechanisms to address motivational and time management issues could enable these researchers to engage more effectively with the international scientific community.

PW4.

CONCLUSIVENESS, READABILITY AND TEXTUAL CHARACTERISTICS OF PLAIN LANGUAGE SUMMARIES FROM MEDICAL AND NON-MEDICAL ORGANIZATIONS: A CROSS-SECTIONAL STUDY

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Background: People with low health literacy should be able to access health information easily, with reading level recommendation of maximum 6th-grade reading level. Cochrane is an international organization developing plain language summaries of systematic reviews (PLSSRs), but it is not the only one. There is a lack of studies assessing differences in characteristics between PLSSRs published by medical organizations and those published by non-medical organizations.

Objectives: This cross-sectional study aimed to compare the conclusiveness, readability, and textual characteristics of PLSSRs between medical and non-medical sciences.

Methods: We analysed all PLSSRs of the last updated versions of systematic reviews published in English until November 10th, 2022, by Cochrane, Campbell Collaboration, and the International Initiative for Impact Evaluation (3ie). PLSSs were acquired from organizations' web pages manually or using the web scraping procedure in R. PLSSRs were categorized into three conclusiveness categories (conclusive, inconclusive, and unclear) using a machine learning tool and manually by two authors. Readability was assessed using SMOG index and textual characteristics were analysed with LIWC and sentiment analysis was conducted in R.

Results: A total of 8474 medical (by Cochrane) and 163 non-medical (152 by Campbell Collaboration and 11 by 3ie) PLSSRs were included in the analysis. Non-medical PLSSs were more conclusive, and the median years of education needed to understand non-medical PLSSRs (SMOG index) was 15.23 (95% CI 14.94 to 15.50) and 15.51 (95% CI 15.47 to 15.58) for medical PLSSRs. Non-medical PLSSRs were longer, written with more confidence (median difference (MDiff) 2.43 on a scale of 0-100 (95% CI 0,08 to 4,75)) and a more positive emotional tone (MDiff=9.9 (95% CI 5,94 to 13,82)) than medical PLSSRs.

Conclusions: There was a great discrepancy in the number of PLSSRs between medical and non-medical areas. However, even on a small sample, we found that writers of non-medical PLSSRs were more confident, wrote in a more positive tone and used more words than writers of medical PLSSRs. Overall, our findings may have significant implications for PLS readers, aiding in strengthening their comprehension and involvement with scientific material, while also boosting their capacity for making healthcare decisions.

PW5.

INCIDENCE OF OROFACIAL INJURIES IN YOUTH CROATIAN NATIONAL WATER POLO TEAM PLAYERS

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Aim: Water polo is a sport with intense physical contacts between players with very little protective equipment, therefore players are at very high risk of orofacial injuries. The main aim of this study was to assess the incidence of sports-related orofacial and dental injuries in youth water polo players, as well as their attitude about the use of mouthguards.

Methods: In this cross-sectional study, total of 58 youth water polo players aged 13-17 years, members of U15, U16 and U17 Croatian National Water Polo teams, completed a questionnaire about the orofacial injuries and its prevention which was administered through Google Forms.

Results: Mean age of the participants was 14.9 ± 1.3 years, and the average time of playing experience was 6.1 ± 1.6 years. Sport-related orofacial injuries were experienced by 16 (27.6%) youth water polo players included in this study, while seven players (12.1%) had suffered tooth injury. Despite their awareness about benefits of mouthguard use, none of the players were using it for various reasons such as discomfort (13 players, 22.4%) or their opinion it was not useful (15 players, 25.9%).

Conclusions: Due to the intensive physical contacts during the game water polo players are prone to sports-related orofacial and dental injuries. The results of this research showed a high incidence of sports-related orofacial and dental injuries among youth water polo players. Although the majority of players were aware of the importance of preventing dental injuries, they did not use mouthguards. In order to decrease the incidence of such injuries, it is extremely important to raise awareness about the mouthguard use and the prevention of possible injuries among water polo players, as well as to develop educational programs about dental injuries and dental emergency procedures for coaches and other professionals working in water polo.

PW6.

ASSESSING THE CURRENT LANDSCAPE OF HEALTH TECHNOLOGY ASSESSMENT KNOWLEDGE AND SKILLS AMONG CLINICIANS IN CROATIA

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Objectives: This study investigated the levels of knowledge and skills required for HTA among clinicians at university hospitals in Croatia, in light of the upcoming EU HTA Regulation (HTAR).

Methods: The questionnaire distributed to medical and dental medical doctors who work in the three largest university hospitals in Croatia (UHC Zagreb, UHC Sestre Milosrdnice, and UHC Split) and to the members of the Croatian Medical Association included questions about basic demographic data, previous scientific and decision-making experience on health technologies, and self-assessed HTA-knowledge/skills and experience related to clinical and non-clinical domains at national and EU level: clinical effectiveness and safety (searching for the studies, critical appraisal skills, summarizing study characteristics and preparing for synthesis, qualitative evidence synthesis, grading the certainty of the evidence, understanding key concepts in data synthesis and analysis), ethics, health economics, organisational and legal aspects and public and patient involvement. The final part of the survey focused on the subjective needs of each respondent toward future education in this field.

Results: So far, the survey was completed by 363 clinicians working at university hospitals in Split and Zagreb. The majority of the respondents were female (63.24%) aged 31-40 years (33.85%). 87.27% of respondents reported that they were never involved in an HTA process, while 77% of them never used the results of an HTA report. When analyzing the skills related to the HTA process, all categories had median scores of either 2 or 3 out of a maximum of 5. Updated results will be available upon finalizing the sample size and completion of the final analysis.

Conclusion: The level of HTA knowledge and skills among Croatian clinicians is currently inadequate to meet HTA standards at national and EU level. Significant investments into HTA infrastructure, education, and practical training are urgently needed. Targeted training based on the results of this study could aid in maintaining the target goals laid out in the EU HTA Regulation, of utmost importance for national process as well.

PW7.

EUROPEAN PSYCHIATRISTS' PERCEPTIONS OF PSYCHEDELIC-ASSISTED PSYCHOTHERAPY: A QUALITATIVE STUDY

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Aims: We wanted to explore how psychiatrists not involved in psychedelic research working within Europe perceive psychedelics and psychedelic-assisted psychotherapy (PAP).

Methods: We conducted online semi-structured interviews with psychiatry specialists and psychiatry trainees of different ages, professional backgrounds, and levels of knowledge on psychedelics. Data were analyzed using the reflexive thematic analysis approach.

Results: We analysed 12 interviews with participants from 8 European countries and developed four main themes. The first theme referred to the potential psychedelics can bring to psychiatry, certain groups of patients, and in understanding the mind. The second theme addressed the perceptions of psychedelics as dangerous substances due to a potential for side effects and unrealistic expectations. The third theme described the sentiment that it was unclear whether psychedelics and PAP would ultimately successfully reach clinical practice. The fourth theme described the polarized opinions on psychedelics among psychiatrists, and the general lack of education and informed discussion on the topic within the psychiatric field.

Conclusions: Psychiatrists acknowledge the potential of PAP but remain cautious and do not yet perceive its evidence base as robust enough. Education on psychedelics is seriously lacking in medical and psychiatric training, and should be greatly improved to facilitate the involvement of mental health experts in decision-making on PAP.

PW8.

EXPRESSION OF INVERSIN AND DISHEVELLED-1 IN THE STOMACH OF YOTARI (DAB1^{-/-}) MICE

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Aims: The co-expression of Inversin and DVL-1 in the stomach of *Yotari* (*Dab1^{-/-}*) mice is examined in order to gain insight into involvement of these two proteins in the gastrointestinal tract development in the case of disruption of Dab1 signaling pathway.

Methods: Stomach samples from homozygous *Yotari* (*Dab1^{-/-}*) mutant mice and C57BL/6N controls were used at embryonic days 13.5 (E13.5) and 15.5 (E15.5). The tissues were fixed, sectioned, and stained using hematoxylin-eosin and immunofluorescence techniques. Immunofluorescence staining was performed using primary antibodies against DVL-1 and Inversin. The staining intensity was evaluated semi-quantitatively, and area percentage of DVL-1 and Inversin positive signals were evaluated quantitatively.

Results: Inversin and DVL-1 protein expression in the epithelium and mesenchyme of *Yotari* (*Dab1*^{-/-}) mice at E13.5 and E15.5 differs significantly. Both proteins were expressed in both tissue types, with variations in intensity, distribution, and quantity. In both the control specimens and the *Yotari* mice, statistical analysis showed significant differences in the area percentage of positive cells between the epithelium and mesenchyme at E13.5 and E15.5.

Conclusions: Understanding the co-expression of Inversin and DVL-1 in the stomach of *Yotari* (*Dab1*^{-/-}) mice may help to clarify the molecular mechanisms underlying the gastrointestinal abnormalities linked to *Dab1* disruption. Clarifying the potential effects on stomach physiology and associated therapeutic strategies will require more investigation.

PW9.

RELATIONSHIP BETWEEN HIP MUSCLES STRENGTH IMBALANCE AND LOW BACK PAIN IN WOMEN

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Objective: Objective of the research was to establish whether weakness of extensor, flexor, adductor and abductor muscles of the hip in the painful side of the body is related to occurrence of low back pain (LBP) in females.

Methods: Eighteen female subjects (N=18, aged 36-39±SD 5,21), reporting chronic pain in lower part of the spine lasting for more than 3 months, were included into research. All subjects had a history of low back pain with symptoms localized in the right (N=12) or in the left (N=6) lumbosacral region. Body mass, body height and body mass index (BMI) are presented through anthropometric data. Isokinetic dynamometer (Con-Trex), was used to measure maximum values of torque of extensor, flexor, adductor and abductor muscles of the hip, in the concentric contraction regime, based on standard procedure and at angular velocity of 60°/s. Mean values of torques of hip muscles, measured in N/m, as well as relative mean values of torques normalized for body mass and measured in N/m/kg, were used in analysis. On the basis of questionnaire (Oswestry Disability Questionnaire), which shows the level of functionality caused by pain, two groups of subjects were identified – group with low pain level and group with moderate pain level.

Results: Results have shown that there is a significant difference between painless and painful side of the body in terms of mean torque value of extensor muscle ($p=0.02$, Cohen's $d=0.58$) and abductor muscle of the hip ($P<0.01$; Cohen's $d=0.71$). There was no difference in mean torque value between flexor and adductor muscles of the hip. Reported level of pain did not affect the differences in mean torque value of extensor ($F=0.53$, $P=0.48$), adductor ($F=0.06$, $P=0.81$) and flexor ($F=2.08$, $P=0.17$) muscles in both legs. On the other hand, although the difference in mean torque value of adductor muscles in subjects that reported low level of pain in comparison with subject that reported moderate level of pain is not significant, ($F=3.95$, $P=0.06$), analysis of effect size for that difference nevertheless indicates that such difference exists (Cohen's $d=0.86$). When evaluating interaction of the leg and groups of pain, only hip flexor muscles show significantly different torque value ($F=5.79$, $P=0.03$).

Conclusion: Female subjects with low back pain showed weakness of extensor and abductor muscles of the hip in the painful side of the body. Although reported level of pain did not affect the difference in mean torque value of abductor muscles, persons reporting higher level of pain tend to have weaker hip abductor muscles. On the other hand, hip flexor muscles in the painful side of the body were significantly weaker in persons reporting moderate pain level, in comparison with persons reporting low pain level.

PW10.

EFFECTS OF CARRYING LOAD IN ONE HAND ON KINEMATIC PARAMETERS OF GAIT IN YOUNG INDIVIDUALS

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Carrying load in one hand (e.g., equipment, small child, work equipment, etc.) is a part of everyday life. Such load carriage reflects on posture and gait parameters. The aim of this research was to examine the effects of unilateral load carriage on basic kinematic gait parameters. The study included 11 participants (4 female, 7 male) with an average age of 20.8 ± 1.3 years and an average body mass index of 23.9 ± 2.5 kg/m². Participants were instructed to walk along a 5 m path at a self-selected velocity, similar to their normal gait, once without load and once carrying a 20 kg weight in their right hand. Using the OptoGate system, spatio-temporal gait characteristics were measured, from which the most basic variables for the right and left leg were selected for this study: step length, stance phase duration, propulsion phase, and contact time. ANOVA was used to determine the effects of load on gait parameters. Correlation analysis was used to examine the relationship between load effects and participants' morphological characteristics. Cohen's analysis was used to determine the size of load effects, as well as their association with morphological characteristics. At a general level, changes occurred in step length for the right ($F=6.07$, $P=0.04$) and left ($F=6.98$, $P=0.01$) legs and in the duration of the support phase for the left leg ($F=6.33$, $P=0.03$). The influence of load on the propulsion phase of the right leg was marginally significant ($F=4.98$, $P=0.06$), and the effect size (Cohen's $d=0.7$) indicates a moderate effect of load on the propulsion phase of gait. Although not statistically significant, effect size analysis suggests a trend of greater load influence among female participants. Correlation analysis found a significant association between the muscle index and differences in left step length resulting from load carriage.

PW11.

CASE REPORT: 10 CENTS CAUSE APPENDICITIS IN 9-YEAR-OLD

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Aims: Our case report aims to describe this rare case of appendicitis that was caused by ingesting a 10-cent coin. This case in the pediatric cases highlights the importance of considering foreign body ingestion and appendicitis after patients are presented with abdominal pain.

Case: A 9-year-old boy was presented at the emergency department with a 12-hour history of abdominal pain followed by fever and nausea. Physical examination showed the patient had a positive Rovsing sign. Laboratory tests showed elevated c-reactive protein (6.5 mg/dL) and high leucocytes (11.5×10^9). Heteroanamnesis from the patients' parents suggested foreign body ingestion. The patient underwent an X-ray which confirmed the diagnosis and showed the foreign body in the tip of the appendix. An open appendectomy was performed and the foreign body was removed. The diagnostic imaging showed a metallic foreign body inside the appendix close to the tip. During open appendectomy, the coin was removed and identified as a 10-cent coin. Pathology confirmed the diagnosis of acute suppurative appendicitis without perforation. The patient recovered without further complications and left the hospital after 48 hours. The follow-up was 2 weeks after and he had no symptoms or needed additional treatment.

Conclusion: This case illustrates a rare cause of appendicitis. Coin ingestion caused the inflammation due to the coin being stuck in the appendix. It highlights the importance of imaging foreign body ingestions. Open appendectomy was performed, while laparoscopic appendectomy might have been a treatment of choice in another hospital center. Further studies should be conducted to show the prevalence of such cases and update diagnostic and treatment guidelines.