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ΒΙΒΛΙΟ ΠΕΡΙΛΗΨΕΩΝ
BOOK OF ABSTRACTS

34Ο ΔΙΕΘΝΕΣ ΣΥΝΕΔΡΙΟ ΦΥΣΙΚΗΣ ΑΓΩΓΗΣ & ΑΘΛΗΤΙΣΜΟΥ

34TH INTERNATIONAL CONGRESS ON PHYSICAL EDUCATION & SPORT SCIENCE

15 - 17 ΜΑΪΟΥ - 2026

ΚΟΜΟΤΗΝΗ

15TH – 17TH MAY – 2026

KOMOTINI

ΥΠΟ ΤΗΝ ΑΙΓΙΔΑ - UNDER THE AUSPICES

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Υπουργείο Παιδείας, Θρησκευμάτων και Αθλητισμού
Γενική Γραμματεία Αθλητισμού

Περιφέρεια Αν. Μακεδονίας - Θράκης

ΔΗΜΟΣ ΚΟΜΟΤΗΝΗΣ

ΔΗΜΟΚΡΙΤΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΡΑΚΗΣ | DEMOCRITUS UNIVERSITY OF THRACE

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ΧΑΙΡΕΤΙΣΜΟΙ

ADDRESSES

Αξιότιμα μέλη της ακαδημαϊκής κοινότητας, αγαπητοί σύνεδροι, συνεργάτες και φίλοι του **Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού**, αγαπητές φοιτήτριες και αγαπητοί φοιτητές.

Με ιδιαίτερη χαρά σας απευθύνω τον θερμό μου χαιρετισμό με αφορμή το φετινό **Διεθνές Συνέδριο Φυσικής Αγωγής και Αθλητισμού του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Δημοκριτείου Πανεπιστημίου Θράκης**. Πρόκειται για έναν θεσμό με μακρά πορεία και σημαντική συμβολή στην προαγωγή της επιστημονικής γνώσης, της έρευνας και της εκπαιδευτικής διαδικασίας στον χώρο της φυσικής αγωγής και του αθλητισμού.

Το ΤΕΦΑΑ του Δημοκριτείου Πανεπιστημίου Θράκης συνεχίζει να διαδραματίζει πρωταγωνιστικό ρόλο τόσο στην Ελλάδα όσο και διεθνώς, μέσα από το υψηλό επίπεδο του εκπαιδευτικού και ερευνητικού του έργου. Η διαρκής προσπάθεια των μελών ΔΕΠ, των ερευνητών, των φοιτητών και των αποφοίτων του Τμήματος ενισχύει ουσιαστικά την ανάπτυξη της αθλητικής επιστήμης και αναδεικνύει το Πανεπιστήμιό μας ως σημείο αναφοράς στον συγκεκριμένο επιστημονικό χώρο.

Η συμβολή του Τμήματος στην εκπαίδευση, στην κοινωνία και στην καλλιέργεια των αξιών του αθλητισμού είναι ιδιαίτερα σημαντική. Οι απόφοιτοί του διακρίνονται ως επιστήμονες, εκπαιδευτικοί, προπονητές και επαγγελματίες, μεταφέροντας στην κοινωνία τις αξίες της συνεργασίας, της άμιλλας, της προσπάθειας και της ευγενούς άθλησης. Παράλληλα, η προώθηση της φυσικής δραστηριότητας και της ευεξίας αποκτά σήμερα ακόμη μεγαλύτερη σημασία, σε μια εποχή όπου η υγεία και η ποιότητα ζωής αποτελούν βασικές προτεραιότητες.

Σημαντική θέση κατέχει πλέον και η ενίσχυση της διεθνοποίησης της ανώτατης εκπαίδευσης και της επιστημονικής συνεργασίας. Το ΤΕΦΑΑ του Δημοκριτείου Πανεπιστημίου Θράκης, μέσα από τις διεθνείς συνεργασίες, τα ερευνητικά δίκτυα, τις συμμετοχές σε ευρωπαϊκά προγράμματα και την εξωστρέφειά του, συμβάλλει ουσιαστικά στη διασύνδεση της ελληνικής ακαδημαϊκής κοινότητας με το διεθνές επιστημονικό περιβάλλον. Η ανταλλαγή γνώσεων, εμπειριών και καλών πρακτικών με πανεπιστήμια και ερευνητικά κέντρα του εξωτερικού δημιουργεί νέες προοπτικές για τους φοιτητές, τους ερευνητές και το ακαδημαϊκό προσωπικό, ενισχύοντας παράλληλα την ποιότητα της εκπαίδευσης και της έρευνας.

Το Δημοκρίτειο Πανεπιστήμιο Θράκης παραμένει σταθερά προσανατολισμένο στη στήριξη της επιστημονικής έρευνας, της καινοτομίας και της ακαδημαϊκής αριστείας, ενισχύοντας κάθε πρωτοβουλία που προάγει τη γνώση και την κοινωνική προσφορά.

Εύχομαι ολόψυχα κάθε επιτυχία στις εργασίες του συνεδρίου και συγχαίρω όλους όσοι συμβάλλουν στη διοργάνωσή του. Είμαι βέβαιος ότι και το φετινό συνέδριο θα αποτελέσει ένα ουσιαστικό πεδίο επιστημονικού διαλόγου, ανταλλαγής γνώσεων και ανάπτυξης νέων συνεργασιών.

Με θερμούς χαιρετισμούς,

Ο Πρύτανης του Δημοκριτείου Πανεπιστημίου Θράκης
Φώτης Μάρης, Καθηγητής

Dear members of the academic community, esteemed delegates, partners, and friends of the **Department of Physical Education and Sport Science**, dear students.

It is with great pleasure that I address my warm greetings to you on the occasion of this year's **International Congress on Physical Education and Sport Science**, organized by the **Department of Physical Education and Sport Science of the Democritus University of Thrace**. This is an institution with a long history and a significant contribution to the promotion of scientific knowledge, research, and the educational process in the field of physical education and sport.

The **Department of Physical Education and Sport Science (DPESS)** of the Democritus University of Thrace continues to play a leading role both in Greece and internationally, through the high level of its educational and research work. The continuous effort of the faculty members, researchers, students, and alumni of the Department substantially enhances the development of sports science and highlights our **university** as a point of reference in this specific scientific field.

The Department's contribution to education, society, and the cultivation of sports values is particularly significant. Its alumni distinguish themselves as scientists, educators, coaches, and professionals, transferring to society the values of cooperation, fair play, effort, and sportsmanship. At the same time, the promotion of physical activity and well-being acquires even greater importance today, in an era where health and quality of life are fundamental priorities.

The enhancement of the internationalization of higher education and scientific cooperation also holds a significant position today. The DPESS of the Democritus University of Thrace, through its international collaborations, research networks, participation in European programs, and its outward-looking approach, contributes substantially to the connection of the Greek academic community with the international scientific environment. The exchange of knowledge, experiences, and best practices with universities and research centers abroad creates new perspectives for students, researchers, and academic staff, while simultaneously enhancing the quality of education and research.

The Democritus University of Thrace remains firmly oriented towards supporting scientific research, innovation, and academic excellence, strengthening every initiative that promotes knowledge and social contribution.

I wholeheartedly wish every success to the proceedings of the congress and congratulate all those who contribute to its organization. I am confident that this year's congress will once again constitute an essential forum for scientific dialogue, knowledge exchange, and the development of new collaborations.

With warm regards,

Rector of the Democritus University of Thrace
Fotis Maris, Professor

Αξιότιμες/οι Σύνεδροι, Αγαπητές/οί Συνάδελφοι,

Με ιδιαίτερη χαρά και τιμή σας καλωσορίζω στο **34ο Διεθνές Συνέδριο Φυσικής Αγωγής και Αθλητισμού**, που πραγματοποιείται στην όμορφη και φιλόξενη πόλη της Κομοτηνής από τις **15 έως τις 17 Μαΐου 2026**, με κεντρικό θέμα: **«Η δύναμη ως θεμέλιο της αθλητικής απόδοσης»**.

Η φετινή διοργάνωση αποτελεί μια μοναδική ευκαιρία για να διερευνήσουμε και να αναδείξουμε, εκτός των άλλων, τον καθοριστικό ρόλο της δύναμης στον τομέα της αθλητικής επιστήμης. Είναι ευρέως αποδεκτό ότι η επιστημονική μελέτη της ανάπτυξης και της εφαρμογής της δύναμης συνιστά θεμελιώδη πυλώνα της προπονητικής διαδικασίας, συμβάλλοντας τόσο στην πρόληψη τραυματισμών όσο και στη βελτιστοποίηση της αθλητικής απόδοσης. Στο πλαίσιο του Συνεδρίου, οι προσκεκλημένες εισηγήσεις, οι θεματικές στρογγυλές τράπεζες και οι επιστημονικές ανακοινώσεις θα δημιουργήσουν ένα γόνιμο πεδίο διαλόγου μεταξύ επιστημόνων και προπονητών. Μέσα από αυτή τη δημιουργική σύνθεση θεωρητικής γνώσης και πρακτικής εμπειρίας, το Συνέδριο φιλοδοξεί να συμβάλει ουσιαστικά στην περαιτέρω ανάπτυξη της αθλητικής επιστήμης και της προπονητικής πράξης.

Η διοργάνωση αυτού του σημαντικού επιστημονικού συνεδρίου αποτελεί μια πολύτιμη ευκαιρία συνάντησης και ουσιαστικής ανταλλαγής γνώσεων, εμπειριών και προβληματισμών, αναδεικνύοντας τον καθοριστικό ρόλο που διαδραματίζουν η φυσική αγωγή και ο αθλητισμός στη σύγχρονη κοινωνία. Σε έναν κόσμο που μεταβάλλεται ταχύτατα και αντιμετωπίζει συνεχώς νέες προκλήσεις, η σημασία της σωματικής και ψυχικής υγείας καθίσταται περισσότερο επίκαιρη από ποτέ. Η επιστήμη της φυσικής αγωγής και του αθλητισμού βρίσκεται στο επίκεντρο αυτής της προσπάθειας, καθώς συνδυάζει την επιστημονική γνώση με την πρακτική εφαρμογή, συμβάλλοντας ουσιαστικά στην προαγωγή της ανθρώπινης ευεξίας και της ποιότητας ζωής.

Το φετινό συνέδριο συγκεντρώνει διακεκριμένους επιστήμονες, ερευνητές και επαγγελματίες από την Ελλάδα και το εξωτερικό, οι οποίοι θα παρουσιάσουν καινοτόμες ερευνητικές προσεγγίσεις, σύγχρονες μεθόδους και πρακτικές που συμβάλλουν στη διαμόρφωση του μέλλοντος της φυσικής αγωγής και του αθλητισμού. Η παρουσία και η ενεργός συμμετοχή σας ενισχύουν τον επιστημονικό διάλογο, προάγουν τη διεπιστημονική συνεργασία και εμπλουτίζουν τη συλλογική μας γνώση, συμβάλλοντας στη δημιουργία μιας δυναμικής επιστημονικής κοινότητας που επιδιώκει την πρόοδο και την αριστεία.

Θα ήθελα να εκφράσω τις θερμές μου ευχαριστίες προς όλους όσους συνέβαλαν στην προετοιμασία και την επιτυχή διοργάνωση του Συνεδρίου, καθώς και προς τους χορηγούς και συνεργάτες που στηρίζουν διαχρονικά το έργο μας. Ιδιαίτερες ευχαριστίες οφείλονται στους εισηγητές και σε όλους τους συμμετέχοντες για την αφοσίωσή τους στην επιστήμη και την εκπαίδευση, καθώς και για τη συνεχή τους προσπάθεια να αναδεικνύουν τις αξίες της φυσικής αγωγής και του αθλητισμού.

Εύχομαι σε όλες και όλους ένα δημιουργικό, παραγωγικό και εμπνευσμένο συνέδριο, γεμάτο γόνιμο διάλογο και ουσιαστικές ανταλλαγές ιδεών. Είμαι βέβαιος ότι οι συζητήσεις και οι επιστημονικές ζυμώσεις που θα πραγματοποιηθούν στο πλαίσιο αυτού του Συνεδρίου θα αποτελέσουν πολύτιμη παρακαταθήκη για το μέλλον της επιστήμης μας και θα ενισχύσουν τις προσπάθειές μας για τη διαμόρφωση μιας κοινωνίας πιο υγιούς, ενεργής και ισορροπημένης.

Με εκτίμηση,
Ο Κοσμήτορας της Σχολής Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας
Ευάγγελος Αλμπανίδης

Honorable Delegates, Dear Colleagues,

It is with great pleasure and honor that I welcome you to the **34th International Congress on Physical Education and Sport Science**, taking place in the beautiful and hospitable city of Komotini from **May 15 to 17, 2026**, with the main theme: **"Strength as the foundation of athletic performance."** This year's event presents a unique opportunity to explore and highlight, among other things, the crucial role of strength in the field of sports science. It is widely accepted that the scientific study of the development and application of strength constitutes a fundamental pillar of the coaching process, contributing to both injury prevention and the optimization of athletic performance. Within the framework of the Congress, the invited lectures, thematic round tables, and scientific presentations will create a fertile ground for dialogue between scientists and coaches. Through this creative synthesis of theoretical knowledge and practical experience, the Congress aspires to contribute substantially to the further development of sports science and coaching practice.

The organization of this significant scientific congress represents a valuable opportunity to meet and meaningfully exchange knowledge, experiences, and reflections, highlighting the decisive role that physical education and sport play in modern society. In a rapidly changing world that constantly faces new challenges, the importance of physical and mental health becomes more relevant than ever. The science of physical education and sport is at the center of this effort, as it combines scientific knowledge with practical application, contributing substantially to the promotion of human well-being and quality of life.

This year's congress gathers distinguished scientists, researchers, and professionals from Greece and abroad, who will present innovative research approaches, modern methods, and practices that contribute to shaping the future of physical education and sport. Your presence and active participation enhance the scientific dialogue, promote interdisciplinary collaboration, and enrich our collective knowledge, contributing to the creation of a dynamic scientific community that strives for progress and excellence.

I would like to express my warm thanks to everyone who contributed to the preparation and successful organization of the Congress, as well as to the sponsors and partners who consistently support our work. Special thanks are due to the speakers and all participants for their dedication to science and education, as well as for their continuous effort to highlight the values of physical education and sport.

I wish everyone a creative, productive, and inspiring congress, full of fruitful dialogue and meaningful exchanges of ideas. I am confident that the discussions and scientific interactions that will take place within the framework of this Congress will serve as a valuable legacy for the future of our science and will strengthen our efforts to shape a healthier, more active, and balanced society.

Sincerely,

The Dean of the School of Physical Education, Sport and Occupational Therapy
Evangelos Albanidis

Αγαπητές και αγαπητοί σύνεδροι, συνάδελφοι και φίλοι

Με πολύ μεγάλη χαρά σάς καλωσορίζω στο **34ο Διεθνές Συνέδριο Φυσικής Αγωγής και Αθλητισμού**, ένα Συνέδριο που συνεχίζει να αποτελεί σημείο αναφοράς για την επιστημονική κοινότητα του αθλητισμού, της φυσικής αγωγής, της άσκησης και της υγείας.

Η δύναμη, που αποτελεί και τη θεματική του φετινού Συνεδρίου, δηλώνει την εξέλιξη, την υπέρβαση - σωματική, πνευματική, ψυχική. Από την καθημερινή άσκηση έως τον πρωταθλητισμό, μετατρέπει την προσπάθεια σε επίδοση, τη γνώση σε πράξη και το όραμα σε αποτέλεσμα.

Με αυτή τη σκέψη, εύχομαι το Συνέδριό μας να αποτελέσει και φέτος έναν χώρο συνάντησης της επιστημονικής γνώσης με την πρακτική εφαρμογή και μετατροπής των ιδεών σε γόνιμο διάλογο και νέες προοπτικές για το μέλλον του αθλητισμού, της φυσικής αγωγής και της υγείας.

Σας ευχαριστώ θερμά για τη συμμετοχή και τη σημαντική συμβολή σας σε αυτή τη διεθνή επιστημονική συνάντηση!

Η Πρόεδρος του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού
Βασιλική Δέρρη,
Καθηγήτρια

Dear delegates, colleagues, and friends,

It is with great pleasure that I welcome you to the 34th International Congress on Physical Education and Sport, a Congress that continues to serve as a point of reference for the scientific community of sports, physical education, exercise, and health.

Strength, which is the main theme of this year's Congress, signifies evolution and transcendence—physical, mental, and emotional. From daily exercise to elite sports, strength transforms effort into performance, knowledge into action, and vision into results.

With this in mind, I wish for our Congress to once again be a meeting place where scientific knowledge connects with practical application, turning ideas into fruitful dialogue and creating new perspectives for the future of sports, physical education, and health.

Thank you warmly for your participation and your significant contribution to this international scientific gathering!

The Chair of the Department of Physical Education and Sport Science
Vasiliki Derri,
Professor

Αγαπητές φίλες και αγαπητοί φίλοι του Συνεδρίου του **Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού**, του **Δημοκρίτειου Πανεπιστημίου Θράκης**, με μεγάλη χαρά σας ανακοινώνω τη διεξαγωγή του **34ου Διεθνούς Συνεδρίου Φυσικής Αγωγής και Αθλητισμού** από τις **15 έως τις 17 Μαΐου 2026**, στην Κομοτηνή με θεματική: **Η Δύναμη ως Θεμέλιο της Αθλητικής Απόδοσης.**

Στο φετινό συνέδριο, το Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, έχει την τιμή να υποδεχθεί και να βραβεύσει τον **Μιχάλη Μουρούτσο**, χρυσό ολυμπιονίκη στο Σίδνεϊ το 2000 την **Μαρία Παπαμάρκου**, Πρόεδρο του Λυκείου Ελληνίδων (Κεντρικό Λύκειο Αθηνών) και τον **Γεώργιο Σιώμο**, Αρχιμανδρίτη της Ιεράς Μητροπόλεως Γερμανίας.

Την Παρασκευή 15 Μαΐου στην Τελετή Έναρξης παραδοσιακά προγραμματίζουμε την απονομή του βραβείου **«Νίκος Σαμαράς»** που φέτος θα δοθεί στον **Θανάση Πραγαλό**, ως αναγνώριση της πολυσχιδούς και διαχρονικής του προσφοράς στην υπηρεσία του αθλητισμού.

Όπως κάθε χρόνο, δε θα λείψουν οι στρογγυλές τράπεζες και τα σεμινάρια με επίκαιρες θεματολογίες και φυσικά η καθιερωμένη συνάντηση αποφοίτων, το Reunion! Με μεγάλη μας χαρά και προσδοκία λοιπόν θα φιλοξενήσουμε τους αποφοίτους του 2006 και η ομάδα μας, έχει ήδη συγκεντρώσει έναν σημαντικό αριθμό τους που είναι έτοιμοι να θυμηθούν, να κλάψουν, να γελάσουν στην αγαπημένη τους Κομοτηνή και στη Σχολή της καρδιάς τους.

Σας επιφυλάσσουμε κι άλλες εκπλήξεις αλλά είναι πολύ νωρίς για να τις αποκαλύψουμε όλες. Άλλωστε η προσδοκία είναι αυτή που μας κρατάει όλους «ζεστούς».

Μείνετε συντονισμένοι/ες με την ιστοσελίδα μας, τη σελίδα μας στο Facebook και το Instagram για να ενημερώνεστε για τα επερχόμενα γεγονότα που θα συγκροτήσουν το οργανωτικό πλαίσιο του **34ου ΔΣΦΑΑ**.

Σας περιμένουμε, για μια ακόμα ξεχωριστή εμπειρία που είναι πλέον συνήθεια, στο αγαπημένο σας συνέδριο.

Η Πρόεδρος της Οργανωτικής Επιτροπής του ΔΣΦΑΑ

Γεωργία Υφαντίδου,

Αναπληρώτρια Καθηγήτρια, ΤΕΦΑΑ – ΔΠΘ

Dear friends of the Conference of the **Department of Physical Education & Sport Science**, of the **Democritus University of Thrace (DUTH)**.

It is with great pleasure that I announce the **34th International Congress on Physical Education and Sport Science**, which will take place from **May 15 to May 17, 2026**, in Komotini, under the theme: **Strength as the Foundation of Athletic Performance**.

At this year's congress, the Department of Physical Education & Sport Science has the honor of welcoming and awarding distinguished guests: **Michalis Mouroutsos**, Olympic gold medalist in Sydney 2000, **Maria Papamarkou**, President of the Lyceum of Greek Women (Athens Central Lyceum) and **Georgios Siomos**, Archimandrite of the Holy Metropolis of Germany.

On **Friday, May 15**, during the Opening Ceremony, we will present the **"Nikos Samaras" Award**, a distinction traditionally awarded within the framework of the congress. This year, the award will be presented to **Thanasis Pragalos**, in recognition of his multifaceted and longstanding contribution to sport.

As every year, the congress program will include **roundtable discussions and workshops on current topics**, as well as the customary **alumni meeting**. This year we will have the pleasure of welcoming the **graduates of 2006**, many of whom have already confirmed their participation to celebrate memories, emotions, and shared experiences in their beloved Komotini.

We have many more surprises planned for you, but it is still too early to reveal them all. After all, **hope is what keeps us all warm**.

Stay tuned to our **website and our social media accounts (Facebook and Instagram)** to stay informed about the upcoming announcements and activities that will shape the program of the **34th Congress**.

We look forward to welcoming you to another unique experience that has now become a tradition at your favorite conference.

The President of the Organizing Committee

Georgia Yfantidou, Associate Professor, DPESS – DUTH

ΕΠΙΤΡΟΠΕΣ
COMMITTEES

ΤΙΜΗΤΙΚΗ ΕΠΙΤΡΟΠΗ

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Γκαράνης Ιωάννης	Δήμαρχος Κομοτηνής
κ.κ. Παντελεήμων	Σεβασμιότατος Μητροπολίτης Μαρωνείας και Κομοτηνής
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Μπρούφας Γεώργιος	Καθηγητής, Τμήματος Αγροτικής Ανάπτυξης Αντιπρύτανης Έρευνας και Καινοτομίας
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Δρυμπέτας Ευάγγελος	Καθηγητής, Τμήματος Οικονομικών Επιστημών, Μέλος του Συμβουλίου Διοίκησης
Γιατρομανωλάκη Αλεξάνδρα	Καθηγήτρια, Τμήματος Ιατρικής, Μέλος του Συμβουλίου Διοίκησης
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ΟΡΓΑΝΩΤΙΚΗ ΕΠΙΤΡΟΠΗ

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Πρόεδρος ΤΕΦΑΑ - ΔΠΘ

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Τοκμακίδης Σάββας	Ομότιμος Καθηγητής ΤΕΦΑΑ - ΔΠΘ

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Γιαννούση Μαρία	Επίκουρη Καθηγήτρια ΤΕΦΑΑ - ΔΠΘ
Δούδα Ελένη	Καθηγήτρια ΤΕΦΑΑ - ΔΠΘ
Ζάρας Νικόλαος	Επίκουρος Καθηγητής ΤΕΦΑΑ - ΔΠΘ
Καμπάς Αντώνιος	Καθηγητής ΤΕΦΑΑ - ΔΠΘ
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Κώστα Γιώργος	Καθηγητής ΤΕΦΑΑ - ΔΠΘ
Παπαδημητρίου Κατερίνα	Αναπληρώτρια Καθηγήτρια ΤΕΦΑΑ - ΔΠΘ
Πάφης Γεώργιος	Μέλος ΕΕΠ, ΤΕΦΑΑ - ΔΠΘ
Σμήλιος Ηλίας	Καθηγητής ΤΕΦΑΑ - ΔΠΘ
Τσίτσκαρη Ευστρατία	Καθηγήτρια ΤΕΦΑΑ - ΔΠΘ
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Ασμανίδου Κατερίνα	Διδακτικό Προσωπικό, ΤΕΦΑΑ - ΔΠΘ
Αστραπέλλος Κωνσταντίνος	Διδάκτορας ΤΕΦΑΑ - ΔΠΘ
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Αυλωνίτη Αλεξάνδρα	Αναπληρώτρια Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Βερναδάκης Νικόλαος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
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Γούργουλης Βασίλειος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Δέρρη Βασιλική	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Δούδα Ελένη	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Ζάρας Νικόλαος	Επίκουρος Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Ισπυρλίδης Ιωάννης	Αναπληρωτής Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Καμπάς Αντώνιος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
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Λαπαρίδης Κωνσταντίνος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Μάλλιου Παρασκευή	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Ματσούκα Ουρανία	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Μιχαλοπούλου Μαρία	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Μπεμπέτσος Ευάγγελος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Μπενέκα Αναστασία	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Παπαδημητρίου Αικατερίνη	Αναπληρώτρια Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Πάφης Γεώργιος	Επίκουρος Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Σμήλιος Ηλίας	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ
Τσίτσκαρη Ευστρατία	Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Υφαντίδου Γεωργία	Αναπληρώτρια Καθηγήτρια, ΤΕΦΑΑ - ΔΠΘ
Φωτεινάκης Παναγιώτης	Επίκουρος Καθηγητής ΤΕΦΑΑ - ΔΠΘ
Χατζηνικολάου Αθανάσιος	Καθηγητής, ΤΕΦΑΑ - ΔΠΘ

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Athanailidis Ioannis	Assistant Professor, DPESS - DUTH
Avloniti Alexandra	Associate Professor, DPESS - DUTH
Bebetsos Evangelos	Professor, DPESS - DUTH
Beneka Anastasia	Professor, DPESS - DUTH
Chatzinikolaou Athanasios	Professor, DPESS - DUTH
Derri Vasiliki	Professor, DPESS - DUTH
Douda Helen	Professor, DPESS - DUTH
FOTEINAKIS Panagiotis	Assistant Professor, DPESS - DUTH
Giannakou Erasmia	Assistant Professor, DPESS - DUTH
Gioftsidou Asimenia	Professor, DPESS - DUTH
Goulimaris Dimitris	Professor, DPESS - DUTH
Gourgoulis Vasilios	Professor, DPESS - DUTH
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Kambas Antonis	Professor, DPESS - DUTH
Kosta George	Professor, DPESS - DUTH
Kouli Olga	Associate Professor, DPESS - DUTH
Laparidis Konstantinos	Professor, DPESS - DUTH
Malliou Paraskevi	Professor, DPESS - DUTH
Matsouka Ourania	Professor, DPESS - DUTH
Michalopoulou Maria	Professor, DPESS - DUTH
Pafis George	Assistant Professor, DPESS - DUTH
Papadimitriou Aikaterini	Associate Professor, DPESS - DUTH
Smilios Ilias	Professor, DPESS - DUTH
Tsitskari Efstratia	Professor, DPESS - DUTH
Vernadakis Nikolaos	Professor, DPESS - DUTH
Yfantidou Georgia	Associate Professor, DPESS - DUTH
Zaras Nikolaos	Assistant Professor, DPESS - DUTH

ΣΤΡΟΓΓΥΛΕΣ ΤΡΑΠΕΖΕΣ

ROUND TABLES

ΟΓΚΟΛΟΓΙΑ 360Ο – ΕΝΣΩΜΑΤΩΝΟΝΤΑΣ ΤΗΝ ΑΣΚΗΣΗ ΣΕ ΟΛΟΚΛΗΡΩΜΕΝΟ ΟΓΚΟΛΟΓΙΚΟ ΜΟΝΤΕΛΟ ΘΕΡΑΠΕΙΑΣ

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Γεώργιος Καπετανάκης, *Πρόεδρος Ελληνικής Ομοσπονδίας Καρκίνου (ΕΛΛΟΚ) και εκπρόσωπος ασθενών με Καρκίνο στην Ελλάδα*

Εθνικός Ελληνικός Κόμβος για την Αποστολή κατά του Καρκίνου

Χρήστος Ζώης, *Επίκουρος Καθηγητής Κλινική Ακτινοθεραπευτικής Ογκολογίας , Τμήμα Ιατρικής , Δημοκρίτειο Πανεπιστήμιο Θράκης*

Μυϊκή Σύσπαση, Μεταβολισμός και Ογκολογικό Μικροπεριβάλλον: Βιολογικοί Μηχανισμοί και Κλινικές Μεταφραστικές Εφαρμογές

(ΔΙΑΔΙΚΤΥΑΚΑ)

Ιλκά Χέινοναν, *Αναπληρωτής Καθηγητής, Τμήμα Κλινικής Ιατρικής, Ερευνητής με Χρηματοδότηση της Ακαδημίας, Κέντρο PET Τουρκού, Φιλανδία*

Απεικόνιση PET/MRI κατά τη διάρκεια Άσκησης σε Ασθενείς με Καρκίνο

Απόστολος Σπάσης, *Κλινικός Εργοφυσιολόγος, Μέλος Ε.Ε.Π., Τμήμα Επιστήμης Φυσικής Αγωγής & Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Exercise Oncology: Η Άσκηση ως Τέταρτος Πυλώνας της Αντικαρκινικής Θεραπείας

Περίληψη:

Η άσκηση αναγνωρίζεται πλέον ως βασικός πυλώνας της σύγχρονης ογκολογικής φροντίδας, με ισχυρά επιστημονικά δεδομένα να τεκμηριώνουν τη συμβολή της στη βελτίωση της ποιότητας ζωής και στη διαχείριση συμπτωμάτων που σχετίζονται τόσο με τη νόσο όσο και με τις αντικαρκινικές θεραπείες, όπως η χημειοθεραπεία, η ακτινοθεραπεία και η χειρουργική αντιμετώπιση. Η

συστηματική και εξατομικευμένη άσκηση συμβάλλει ουσιαστικά στη μείωση της κόπωσης που σχετίζεται με τον καρκίνο, στη διατήρηση της μυϊκής μάζας και της λειτουργικής ικανότητας, καθώς και στη βελτίωση της ψυχολογικής ευεξίας. Η αποτελεσματική εφαρμογή της στην κλινική πράξη προϋποθέτει διεπιστημονική συνεργασία και οργανωμένο σχεδιασμό, με τη συμμετοχή ογκολόγων, ακτινοθεραπευτών, επιστημόνων ειδικών της άσκησης. Παράλληλα, η ενεργός εμπλοκή των συλλόγων φίλων και υποστήριξης ασθενών με καρκίνο ενισχύει την ενημέρωση, την ενδυνάμωση και την πρόσβαση των ασθενών σε δομημένα προγράμματα άσκησης. Η προσέγγιση «Ογκολογία 360°» προτείνει ένα ολοκληρωμένο, ανθρωποκεντρικό μοντέλο φροντίδας, όπου η άσκηση ενσωματώνεται συστηματικά στο θεραπευτικό πλάνο, αποτελώντας αναπόσπαστο στοιχείο της ολιστικής ογκολογικής αντιμετώπισης.

Συζήτηση:
Σχόλια, απόψεις, προτάσεις.

Σχολιάζοντας τις εξελίξεις, ενισχύοντας τη φωνή των ασθενών

-Σύλλογος Καρκινοπαθών και Φίλων Νομού Ροδόπης «Δύναμη Ψυχής», συμμετοχή μελών
-Σύλλογος Καρκινοπαθών και Φίλων Νομού Έβρου «ΣυνεχίΖΩ», συμμετοχή μελών
-Σύλλογος Καρκινοπαθών και Φίλων Νομού Ξάνθης «παραΜΕΝΟΝΤΑΣ ΖΩΗροί», συμμετοχή μελών

Με την υποστήριξη του Διϊδρυματικού Προγράμματος Μεταπτυχιακών Σπουδών: «Κλινική Άσκηση και Εφαρμογές της Τεχνολογίας στην Υγεία» του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού της Σχολής Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Δημοκριτείου Πανεπιστημίου Θράκης σε συνεργασία με το Εθνικό Κέντρο Έρευνας Φυσικών Επιστημών «ΔΗΜΟΚΡΙΤΟΣ» – Ινστιτούτο Πληροφορικής και Τηλεπικοινωνίων

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

και των:

ΕΛΛΗΝΙΚΗ ΟΜΟΣΠΟΝΔΙΑ ΚΑΡΚΙΝΟΥ ΕΛΛΟΚ

ΣΥΛΛΟΓΟΣ ΚΑΡΚΙΝΟΠΑΘΩΝ ΚΑΙ ΦΙΛΩΝ ΝΟΜΟΥ ΞΑΝΘΗΣ "παραΜΕΝΟΝΤΑΣ ΖΩΗροί"

Δύναμη Ψυχής
ΣΥΛΛΟΓΟΣ ΚΑΡΚΙΝΟΠΑΘΩΝ & ΦΙΛΩΝ ΡΟΔΟΠΗΣ

ΣυνεχίΖω

ONCOLOGY 360° – INTEGRATING EXERCISE INTO A COMPREHENSIVE ONCOLOGY CARE MODEL

Roundtable Director:

Helen Douda, *Professor, D.P.E.S.S., Democritus University of Thrace, Director of the Inter-institutional Postgraduate Program:* ***Clinical Exercise and Applications of Technology in Health***

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Chair:

Savvas Tokmakidis, *Emeritus Professor, D.P.E.S.S., Democritus University of Thrace*

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Michail Koukourakis, *Professor of Radiation Oncology, Department of Medicine, Democritus University of Thrace*

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Speakers:

Georgios Kapetanakis, *President of the Hellenic Cancer Federation (ELLOK) and patient representative for Cancer in Greece*

The Greek National Cancer Mission Hub

Christos Zois, *Assistant Professor of Clinical Radiation Oncology, Department of Medicine, Democritus University of Thrace*

Muscle Contraction, Metabolism and the Tumor Microenvironment: Biological Mechanisms with Translational Implications

(VIRTUAL)

Ilkka Heinonen, *Docent, Department of Clinical Medicine, Academy Research Fellow, Turku PET Centre, Finland*

PET/MRI Imaging during Exercise in Cancer Patients

Apostolos Spassis, *Clinical Exercise Physiologist, Specialized Teaching Staff, D.P.E.S.S., Democritus University of Thrace*

Exercise Oncology: Exercise as the Fourth Pillar of Cancer Treatment

Abstract:

Exercise is now recognized as a fundamental pillar of modern oncology care, with robust scientific evidence supporting its contribution to improving quality of life and managing symptoms associated both with the disease itself and with anticancer treatments, including chemotherapy, radiotherapy, and surgery. Systematic and individualized exercise significantly contributes to reducing cancer-related fatigue, preserving muscle mass and functional capacity, and enhancing psychological well-being. Its effective implementation in clinical practice requires interdisciplinary collaboration and structured planning, involving oncologists, radiation oncologists, and exercise specialists. At the same time, the active engagement of cancer patient advocacy and support organizations plays a crucial role in raising awareness, empowering patients, and facilitating access to structured exercise programs. The “Oncology 360°” approach proposes a comprehensive, patient-centered model of care in which exercise is systematically integrated into the treatment plan, constituting an essential component of holistic oncology management.

Discussion:

Comments, insights, and proposals from members

Commenting on Current Developments and Amplifying the Voice of Patients

Participating Associations and Members:

-Cancer Patients and Friends Association of Rodopi Prefecture – “Dynamis Psychis” (Strength of Soul)
-Cancer Patients and Friends Association of Evros Prefecture – “Synexizo” (I Continue)
-Cancer Patients and Friends Association of Xanthi Prefecture – “Paramenontas Zoiroi” (Remaining Full of Life)

Postgraduate Program: "Clinical Exercise and Applications of Technology in Health" of the Department of Physical Education and Sport of the School of Physical Education and Sport Science of Democritus University of Thrace in collaboration with the National Center for Science Research "DEMOKRITOS"- The Institute of Informatics and Telecommunications (IIT)

Interinstitutional Postgraduate Studies Program
Clinical Exercise &
Technologies Application in Health

and:

Hellenic Cancer Federation (ELLOK)

Cancer Patients and Friends Association of Rodopi Prefecture –"Dynamis Psychis" (Strength of Soul)

Cancer Patients and Friends Association of Evros Prefecture –"Synexizo" (I Continue)

Cancer Patients and Friends Association of Xanthi Prefecture – "Paramenontas Zoiroi" (Remaining Full of Life)

ΑΡΣΗ ΒΑΡΩΝ: ΒΙΟΛΟΓΙΚΗ ΒΑΣΗ, ΠΡΟΠΟΝΗΤΙΚΕΣ ΚΑΙ ΔΙΑΤΡΟΦΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ ΕΝΙΣΧΥΣΗΣ ΤΗΣ ΕΠΙΔΟΣΗΣ

Προεδρείο:

Ηλίας Σμήλιος, *Καθηγητής, ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης, Διευθυντής του Π.Μ.Σ. «Φυσιολογία της Άσκησης & Προπονητική»*

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Νικόλαος Ζάρας, *Επίκουρος Καθηγητής, Προπόνηση με Αντιστάσεις και Νευρομυϊκές Προσαρμογές, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Σχολή Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Δημοκρίτειο Πανεπιστήμιο Θράκης, Κομοτηνή*

Θεόδωρος Σταμπουλής, *Επίκουρος Καθηγητής, Διατροφή και Φυσική Δραστηριότητα ως Παράμετροι Ποιότητας Ζωής, Τμήμα Εργοθεραπείας, Σχολή Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Δημοκρίτειο Πανεπιστήμιο Θράκης, Κομοτηνή*

Θεανώ Ζαγκλιβέρη, *Πρώην αθλήτρια της άρσης βαρών, νυν Πρόεδρος της Ελληνικής Ομοσπονδίας Άρσης Βαρών*

Περίληψη:

Σκοπός της στρογγυλής τράπεζας είναι να παρουσιαστούν η βιολογική βάση της επίδοσης, οι προπονητικές στρατηγικές μεγιστοποίησης της επίδοσης πριν τον αγώνα και οι βασικές διατροφικές στρατηγικές ενίσχυσης της επίδοσης. Στην άρση βαρών, η άλιπη μάζα φαίνεται να έχει προσδιοριστικό ρόλο στην επίδοση τόσο σε άνδρες όσο και σε γυναίκες. Μελέτες δείχνουν ότι το ποσοστό κατανομής μυϊκών ινών τύπου IIα υπερισχύει στο σύνολο της κατανομής των μυϊκών ινών ενώ υπάρχει σημαντική σύνδεση ανάμεσα σε κατανομή μυϊκών ινών τύπου IIα με την επίδοση. Επιπροσθέτως, οι αθλητές/τριες της άρσης βαρών διακρίνονται για την υψηλή νευρική ενεργοποίηση των πρωταγωνιστών μυών κάτι που οδηγεί σε υψηλή επιστράτευση κινητικών μονάδων και κατά συνέπεια υψηλή παραγωγή μυϊκής ισχύος. Πρακτικά, η μακροχρόνια προπόνηση της άρσης βαρών ενισχύει το βιολογικό δυναμικό των αθλητών/τριων οδηγώντας σε σημαντικές αυξήσεις στη δύναμη, στην ισχύ αλλά και στην επίδοση. Η επίδοση φαίνεται να μεγιστοποιείται πριν τους αγώνες με το

φορμάρισμα. Το φορμάρισμα στην άρση βαρών πραγματοποιείται με μείωση της προπονητικής έντασης και όγκου την τελευταία εβδομάδα πριν τον αγώνα. Για έναν επιτυχημένο αγώνα προτείνεται φορμάρισμα διάρκειας 8,0±4,4 ημερών, με την τελευταία προπόνηση υψηλής έντασης να γίνεται 5,9±2,3 ημέρες πριν τον αγώνα, ενώ προτείνεται 1,5±0,6 ημέρες πλήρης αποχή από την προπόνηση. Ωστόσο, ερευνητικά δεδομένα δείχνουν ότι μία προπόνηση ενεργοποίησης, χαμηλού όγκου αλλά υψηλής έντασης-ταχύτητας των επαναλήψεων, 6 με 24 ώρες πριν τον αγώνα, μπορεί να ενισχύσει την επίδοση. Επιπροσθέτως, η διατροφή των αθλητών/τριων στην άρση βαρών, είτε αυτοί είναι ενήλικες είτε αναπτυξιακής ηλικίας, αποτελεί θεμελιώδη παράγοντα για τη βελτιστοποίηση της αθλητικής απόδοσης. Η επαρκής πρόσληψη μακρο-θρεπτικών συστατικών είναι καίριας σημασίας για την ανάπτυξη της μυϊκής μάζας, τη νευρομυϊκή απόδοση και την αποκατάσταση των αθλητών από την προπονητική επιβάρυνση. Επιπλέον, η υιοθέτηση ορθών διατροφικών συνηθειών και τακτικών μπορεί να συμβάλλει στην καλύτερη διαχείριση της σωματικής μάζας και στην ενίσχυση της απόδοσης κατά την αγωνιστική περίοδο.

Με την υποστήριξη του Π.Μ.Σ. "Φυσιολογία της Άσκησης & Προπονητική"

Πρόγραμμα Μεταπτυχιακών Σπουδών
Φυσιολογία της Άσκησης
& Προπονητική

OLYMPIC WEIGHTLIFTING: BIOLOGICAL DETERMINANTS, TRAINING AND NUTRITION STRATEGIES TO ENHANCE PERFORMANCE

Chair:

Ilias Smilios, *Professor DPESS, Democritus University of Thrace, Director of the Postgraduate Program: "Exercise Physiology and Sports Training Science"*

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Athanasios Chatzinikolaou, *Professor DPESS, Democritus University of Thrace*

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Speakers:

Gerasimos Terzis, *Professor,* *Athletic Throws, Dean of School of Physical Education and Sport Science, National and Kapodistrian University of Athens, Greece*

Nikolaos Zaras, *Assistant Professor, Resistance Training and Neuromuscular Adaptations, Department of Physical Education and Sport Science, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace, Komotini, Greece*

Theodoros Stampoulis, *Assistant Professor, Nutrition and Physical Activity as Quality-of-Life Parameters, Department Occupational Therapy, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace, Komotini, Greece*

Theano Zaglivery, *Former Weightlifting Athlete, Current President of the Hellenic Weightlifting Federation*

Abstract:

The purpose of the roundtable is to present the biological determinants which influence weightlifting performance as we as the training and nutrition strategies to enhance weightlifting performance especially prior to competitions. In weightlifting, lean mass in both male and female athletes seems to contribute to performance. Studies have shown that the percentage of muscle fiber type IIa distribution prevails over the total muscle fiber distribution while a significant connection exists between percentage muscle fiber IIa and weightlifting performance. Moreover, weightlifters are known for their high neuromuscular activation of the protagonist muscles which lead to a higher recruitment of type II motor units and as a consequence to greater power production. From a practical perspective, long-term training enhances the biological determinants, leading to significant increases in strength, power and performance. In addition, performance is enhanced prior to major competitions with tapering. Tapering in weightlifting includes the reduction of both training intensity and

volume, especially during the final week before the competition. For a successful competition it is suggested a tapering period of 8.0±4.4 days, with the last high intensity training performed 5.9±2.3 days prior to competition while it is recommended 1.5±0.6 days abstinence from training. However, research evidence suggests that a priming training session with low volume and moderate to high intensity 6-24 hours prior to competition may significantly enhance performance. Furthermore, nutrition in youth or adult athletes is a foundation factor for enhancing performance. Adequate macronutrient intake is crucial for muscle mass development, neuromuscular performance, and recovery from training stress. Additionally, adopting proper nutritional habits and strategies can contribute to better body mass management and enhanced performance during the competitive season.

With the support of the "Exercise Physiology and Sports Training Science" Postgraduate Program:

Postgraduate Program
Exercise Physiology and
Sports Training Science

ΝΕΥΡΟΑΝΑΠΤΥΞΙΑΚΗ ΩΡΙΜΑΝΣΗ ΣΤΗΝ ΠΑΙΔΙΚΗ ΗΛΙΚΙΑ ΚΑΙ ΔΕΙΚΤΕΣ ΜΑΧΗΤΙΚΗΣ ΑΠΟΔΟΣΗΣ ΣΤΟ ΤΑΕΚΒΟΝΤΟ: ΔΙΕΠΙΣΤΗΜΟΝΙΚΗ ΠΡΟΣΕΓΓΙΣΗ

Προεδρείο:

Κωνσταντίνος Μπέης (*PhD, MSc), ΕΕΠ, ΤΕΦΑΑ-ΑΠΘ*

Ορμανλίδης Χρήστος (MSc), *Αποσπασμένος καθηγητής Ταεκβοντό ΤΕΦΑΑ-ΔΠΘ*

Ομιλητές:

Μουρούτσος Μιχάλης, *Χρυσός Ολυμπιονίκης Ταεκβοντό*

Κωνσταντίνος Μπέης *(PhD, MSc), ΕΕΠ, ΤΕΦΑΑ-ΑΠΘ*

Χρηστίδης Ανδρέας, *Καθηγητής Φυσικής Αγωγής (MSc)*

Κάββουρα Αγγελική, *Υποψήφια Διδάκτωρ ΔΠΘ*

Θεοδώρου Ευάγγελος, *Καθηγητής Φυσικής Αγωγής, Phd στην Ιατρική*

Περίληψη:

Η στρογγυλή τράπεζα επιχειρεί μια ολοκληρωμένη προσέγγιση του Ταεκβοντό ως αναπτυξιακού και αγωνιστικού μοντέλου, συνδέοντας την επίδρασή του στην εγκεφαλική ωρίμανση και την ψυχοσωματική ανάπτυξη του παιδιού με τα σύγχρονα επιστημονικά δεδομένα αξιολόγησης της μαχητικής απόδοσης. Αναλύεται η συμβολή του αθλήματος στη λειτουργική ωρίμανση του εγκεφάλου και του κεντρικού νευρικού συστήματος, μέσα από το πολυσύνθετο κινητικό και γνωστικό του περιβάλλον. Ο πλούτος τεχνικών, τακτικών επιλογών, συνδυαστικών κινήσεων, μορφών παραδοσιακής και αγωνιστικής εξάσκησης, καθώς και η χρήση εξειδικευμένων παιχνιδιών, δημιουργούν συνθήκες αυξημένης νευρομυϊκής και γνωστικής διέγερσης. Ενισχύονται λειτουργίες όπως η προσοχή, η συγκέντρωση, η μνήμη, η αντίληψη, η ταχεία λήψη αποφάσεων και η ταυτόχρονη επεξεργασία πολλαπλών ερεθισμάτων, στοιχεία καθοριστικά για τη συνολική ανάπτυξη του παιδιού. Παράλληλα, παρουσιάζονται σύγχρονα ερευνητικά δεδομένα σχετικά με την αντικειμενική αξιολόγηση της μαχητικής ικανότητας. Η δοκιμασία συχνότητας–ταχύτητας λακτισμάτων, η μυϊκή ισχύς, ο ρυθμός εφαρμογής της δύναμης, οι επιδόσεις σε κατακόρυφα και οριζόντια άλματα και η σύσταση σώματος αναδεικνύονται ως βασικοί δείκτες αγωνιστικού επιπέδου. Ιδιαίτερη έμφαση δίνεται στη σημασία του μακροχρόνιου προγραμματισμού και της αποφυγής πρόωρης εξειδίκευσης, με στόχο την ψυχοσωματική ασφάλεια και τη βιώσιμη αθλητική εξέλιξη. Η επιστημονική τεκμηρίωση πλαισιώνεται από τη βιωματική εμπειρία του Χρυσού Ολυμπιονίκη Μιχάλη Μουρούτσου, αναδεικνύοντας τη σύνδεση μεταξύ αναπτυξιακής βάσης και υψηλής αγωνιστικής διάκρισης.

NEURODEVELOPMENTAL MATURATION IN CHILDHOOD AND INDICATORS OF COMBAT PERFORMANCE IN TAEKWONDO: A MULTIDISCIPLINARY APPROACH

Chair:

Konstantinos Beis, *(PhD, MSc), EEP, TEFAA-AUTH*

Christos Ormanlidis (MSc)

Speakers:

Michalis Mouroutsos, *Gold Olympic Taekwondo Champion*

Konstantinos Beis *(PhD, MSc), EEP, TEFAA-AUTH*

Andreas Christidis, *Professor of Physical Education (MSc)*

Angeliki Kavvoura, *PhD candidate*

Evangelos Theodorou, *Professor of Physical Education, PhD in Medicine*

Abstract:

This round table aims to present Taekwondo as an integrated developmental and performance model, linking its contribution to brain maturation and psychosomatic development in childhood with contemporary scientific approaches to combat performance assessment.The contribution of Taekwondo to functional brain and central nervous system maturation is examined through its complex motor and cognitive environment. The wide repertoire of techniques, tactical decisions, combinational movements, traditional and competitive practice forms, as well as the use of specialized games, create conditions of heightened neuromuscular and cognitive stimulation. Core cognitive functions—including attention, concentration, memory, perception, rapid decision-making, and the simultaneous processing of multiple external stimuli—are systematically enhanced, contributing significantly to the child's overall developmental trajectory. Furthermore, contemporary research findings on objective combat performance evaluation are presented. The frequency–speed kick test, muscular power, rate of force development, vertical and horizontal jump performance, and body composition emerge as key indicators of competitive level and athletic performance. Particular emphasis is placed on long-term athlete development planning and the avoidance of early specialization, aiming to ensure psychosomatic safety and sustainable athletic progression. The scientific framework is complemented by the experiential contribution of Olympic Gold Medalist Michalis Mouroutsos, highlighting the link between a properly structured developmental foundation and high-level competitive success.

FOOD & WINE: Η ΣΥΓΚΛΙΣΗ ΤΕΧΝΟΛΟΓΙΑΣ, ΒΙΩΣΙΜΟΤΗΤΑΣ ΚΑΙ ΓΑΣΤΡΟΝΟΜΙΑΣ

Προεδρείο:

Μαρία Παππά, *Καθηγήτρια και Πρόεδρος του Τμήματος Αγροτικής Ανάπτυξης ΔΠΘ*

Ομιλητές:

Μαρία Παππά, *Καθηγήτρια και Πρόεδρος του Τμήματος Αγροτικής Ανάπτυξης ΔΠΘ*

Από τη βιολογική φυτοπροστασία στη γεωργία μειωμένων εισροών: εργαλεία και προσεγγίσεις για την επίτευξη των στόχων του Green Deal και του Farm to Fork

Αθανάσιος Αλεξόπουλος, *Καθηγητής στο Τμήμα Αγροτικής Ανάπτυξης ΔΠΘ*

Ψηφιακή γεωργία, γεωργία ακριβείας και νέες μορφές τροφίμων: Προκλήσεις και ευκαιρίες για την υγιεινή και ασφάλεια τροφίμων

Αικατερίνη Καραμπατέα, *Επίκουρη Καθηγήτρια στο Τμήμα Αμπελουργίας και Οινολογίας ΔΠΘ*

Η νέα εποχή του οίνου: Ηθική καλλιέργεια και τεχνολογία επαναπροσδιορίζουν την εμπειρία

Δημήτριος Τζιοβάρας, *Σεφ στο Μακεδονία Παλλάς*

Σύγχρονη γαστρονομία και λειτουργική διατροφή

Θεόδωρος Μαρκόπουλος, *Αντιπεριφερειάρχης Καβάλας και Επίκουρος Καθηγητής στο Τμήμα Χημείας του ΔΠΘ*

Τρόφιμα : απαιτήσεις προοπτικές

Περίληψη:

Η στρογγυλή τράπεζα θα αναδείξει τον δυναμικό μετασχηματισμό του αγροδιατροφικού τομέα μέσα από τη σύγκλιση της τεχνολογίας, της βιωσιμότητας και της σύγχρονης γαστρονομίας. Οι εισηγήσεις των ομιλητών θα προσφέρουν μια ολοκληρωμένη προσέγγιση που θα εκτείνεται από την πρωτογενή παραγωγή έως την τελική καταναλωτική εμπειρία.

Η Μαρία Παππά, Καθηγήτρια και Πρόεδρος του Τμήματος Αγροτικής Ανάπτυξης ΔΠΘ, θα επικεντρωθεί στη μετάβαση από τη συμβατική γεωργία σε συστήματα μειωμένων εισροών, παρουσιάζοντας εργαλεία και πρακτικές βιολογικής φυτοπροστασίας. Θα τονίσει τη σημασία της ευθυγράμμισης με τους στόχους του Green Deal και της στρατηγικής Farm to

Fork, υπογραμμίζοντας ότι η βιωσιμότητα θα αποτελέσει βασικό πυλώνα για το μέλλον της γεωργίας.

Ο Αθανάσιος Αλεξόπουλος, Καθηγητής στο Τμήμα Αγροτικής Ανάπτυξης ΔΠΘ, θα αναλύσει τον ρόλο της ψηφιακής γεωργίας και της γεωργίας ακριβείας στη διασφάλιση της ποιότητας και της ασφάλειας των τροφίμων. Παράλληλα, θα εξετάσει τις προκλήσεις και τις ευκαιρίες που θα προκύψουν από τις νέες μορφές τροφίμων, επισημαίνοντας την ανάγκη για σύγχρονα ρυθμιστικά πλαίσια και καινοτόμες προσεγγίσεις.

Ο Θεόδωρος Μαρκόπουλος, Αντιπεριφερειάρχης Καβάλας και Επίκουρος Καθηγητής στο Τμήμα Χημείας του ΔΠΘ, θα εξετάσει την αγορά τροφίμων και τις μελλοντικές της προοπτικές, αναλύοντας τις τάσεις κατανάλωσης, τις μεταβολές στη ζήτηση και τον ρόλο της καινοτομίας στη διαμόρφωση νέων επιχειρηματικών μοντέλων. Θα αναδείξει τις ευκαιρίες αλλά και τις προκλήσεις που θα αντιμετωπίσει ο κλάδος σε ένα διαρκώς μεταβαλλόμενο οικονομικό και κοινωνικό περιβάλλον.

Η Αικατερίνη Καραμπατέα, Επίκουρη Καθηγήτρια στο Τμήμα Αμπελουργίας και Οινολογίας ΔΠΘ, θα παρουσιάσει τη νέα εποχή του οίνου, όπου η ηθική καλλιέργεια και η τεχνολογία θα επαναπροσδιορίσουν την παραγωγή και την εμπειρία κατανάλωσης. Θα δώσει έμφαση στη βιωσιμότητα, την ιχνηλασιμότητα και την ενίσχυση της ταυτότητας του προϊόντος.

Ο Δημήτριος Τζιοβάρας, Σεφ στο Μακεδονία Παλλάς, θα προσεγγίσει τη σύγχρονη γαστρονομία μέσα από το πρίσμα της λειτουργικής διατροφής, αναδεικνύοντας τη σύνδεση μεταξύ γεύσης, υγείας και επιστήμης. Θα επισημάνει ότι ο σύγχρονος σεφ θα διαδραματίσει καθοριστικό ρόλο στην ενσωμάτωση της καινοτομίας και των βιώσιμων πρακτικών στη γαστρονομική δημιουργία.

Συνολικά, η συζήτηση θα καταδείξει ότι το μέλλον του τομέα food & wine θα διαμορφωθεί μέσα από τη διεπιστημονική συνεργασία και την υιοθέτηση βιώσιμων και καινοτόμων πρακτικών, με στόχο την παραγωγή ποιοτικών, ασφαλών και σύγχρονων προϊόντων που θα ανταποκρίνονται στις ανάγκες του καταναλωτή.

FOOD & WINE: THE CONVERGENCE OF TECHNOLOGY, SUSTAINABILITY, AND GASTRONOMY

Chair:

Maria Pappa, *Professor and Head of the Department of Agricultural Development DUTh*

Speakers:

Maria Pappa, *Professor and Head of the Department of Agricultural Development DUTh*

From biological crop protection to low-input agriculture: tools and approaches to achieve the Green Deal and Farm to Fork goals

Athanasios Alexopoulos, *Professor at the Department of Agricultural Development DUTh*

Digital agriculture, precision farming, and novel foods: challenges and opportunities for food hygiene and safety

Aikaterini Karampatea, *Assistant Professor at the Department of Viticulture and Oenology DUTh*

The new era of wine: ethical cultivation and technology redefining the experience

Dimitrios Tziovaras, *Chef at Makedonia Palace*

Modern gastronomy and functional nutrition

Theodoros Markopoulos, *Vice Regional Governor of Kavala and Assistant Professor at the Department of Chemistry of DUTh*

Food market and future prospects

Abstract:

The roundtable will highlight the dynamic transformation of the agri-food sector through the convergence of technology, sustainability, and modern gastronomy. The speakers' contributions will offer a comprehensive approach, spanning from primary production to the final consumer experience. Maria Pappa, Professor and Head of the Department of Agricultural Development DUTh, will focus on the transition from conventional agriculture to low-input systems, presenting tools and practices of biological plant protection. She will emphasize the importance of aligning with the objectives of the Green Deal and the Farm to Fork strategy, underlining that sustainability will become a key pillar for the future of agriculture. Athanasios Alexopoulos, Professor at the Department of Agricultural Development DUTh, will analyze the role of digital agriculture and precision farming in ensuring food quality and safety. At the same time, he will explore the challenges and

opportunities arising from new forms of food, highlighting the need for modern regulatory frameworks and innovative approaches. Theodoros Markopoulos, Vice Regional Governor of Kavala and Assistant Professor at the Department of Chemistry of DUTh, will examine the food market and its future prospects, analyzing consumption trends, shifts in demand, and the role of innovation in shaping new business models. He will highlight both the opportunities and the challenges the sector will face in an ever-changing economic and social environment. Aikaterini Karampatea, Assistant Professor at the Department of Viticulture and Oenology DUTh, will present the new era of wine, where ethical cultivation and technology will redefine both production and consumption experiences. She will place emphasis on sustainability, traceability, and strengthening product identity. Dimitrios Tziovaras, Chef at Makedonia Palace, will approach modern gastronomy through the lens of functional nutrition, highlighting the connection between taste, health, and science. He will point out that the contemporary chef will play a decisive role in integrating innovation and sustainable practices into the gastronomic experience. Overall, the discussion will demonstrate that the future of the food & wine sector will be shaped through interdisciplinary collaboration and the adoption of sustainable and innovative practices, aiming to produce high-quality, safe, and modern products that meet consumer needs.

ΠΑΡΑΓΟΝΤΕΣ ΠΟΥ ΕΠΗΡΕΑΖΟΥΝ ΤΗΝ ΠΡΟΛΗΨΗ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗ ΤΡΑΥΜΑΤΙΣΜΩΝ ΣΕ ΔΥΝΑΜΙΚΑ ΑΘΛΗΜΑΤΑ

Προεδρείο:

Παρασκευή Μάλλιου, Καθηγήτρια ΤΕΦΑΑ - ΔΠΘ

Γεώργιος Τσικούρης,

Ομιλητές:

Γεώργιος Τσικούρης,

Ασημένια Γιοφτσίδου,

Αθανάσιος Γκρεκίδης,

Θεόδωρος Σταμπουλής

Περίληψη:

Στην στρογγυλή τράπεζα με θεματολογία την πρόληψη και διαχείριση τραυματισμών σε δυναμικά αθλήματα θα παρουσιαστούν επιδημιολογικά στοιχεία για τους τραυματισμούς που εμφανίζονται σε δυναμικά αθλήματα όπως η άρση βαρών και η πάλη. Επιπλέον, θα αναλυθούν οι αρχές σχεδιασμού προγραμμάτων αποκατάστασης μετά από τραυματισμούς που συμβαίνουν στην άρση βαρών. Για το άθλημα της πάλης, με βάση τα επιδημιολογικά στοιχεία των τραυματισμών που έχουν καταγραφεί, θα αναφερθούν οι παράγοντες που πρέπει να ληφθούν υπόψη για τον αποτελεσματικό σχεδιασμό ενός προγράμματος πρόληψης τραυματισμών. Σημαντικό ρόλο στην διαχείριση των αθλητών δυναμικών αθλημάτων παίζει η διατροφή. Θα αναλυθεί η διατροφική προσέγγιση των αθλητών άρσης βαρών που στοχεύει στη βελτιστοποίηση της απόδοσης, της δύναμης και της αποκατάστασης μετά την προπόνηση. Οι ενεργειακές ανάγκες είναι αυξημένες λόγω της έντονης προπόνησης, επομένως απαιτείται επαρκής πρόσληψη θερμίδων και σωστή κατανομή των μακροθρεπτικών συστατικών. Επιπλέον, ο στρατηγικός σχεδιασμός της διατροφής συχνά αποτελεί καίριο στοιχείο στην πρόληψη κι αποκατάσταση τραυματισμών, οι οποίοι συχνά εμφανίζονται λόγω των υψηλών φορτίων και των υψηλών εντάσεων.

FACTORS THAT AFFECT THE PREVENTION AND MANAGEMENT OF INJURIES IN DYNAMIC SPORTS

Chair:

Paraskevi Malliou, Professor, DPESS – DUTH

George Tsikouris

Speakers:

George Tsikouris

Asimenia Gioftsidou

Athanasios Gkrekidis

Theodoros Staboulis

Abstract:

The roundtable discussion on the prevention and management of injuries in power sports will present epidemiological data on injuries that occur in power sports such as weightlifting and wrestling. In addition, the principles of designing rehabilitation programs after injuries that occur in powerlifting will be analyzed. For the sport of wrestling, based on the epidemiological data of the injuries that have been recorded, the factors that must be taken into account for the effective design of an injury prevention program will be mentioned. Nutrition plays an important role in the management of power sports athletes. The nutritional approach of weightlifting athletes will be analyzed, which aims to optimize performance, strength and recovery after training. Energy needs are increased due to intense training, therefore adequate calorie intake and proper distribution of macronutrients are required. Furthermore, strategic nutrition planning is often a key element in the prevention and recovery of injuries, which often occur due to high loads and high intensities.

ΔΙΕΡΕΥΝΗΣΗ ΤΗΣ ΔΕΣΜΕΥΣΗΣ ΤΗΣ ΚΟΙΝΟΤΗΤΑΣ ΣΤΗ ΦΥΣΙΚΗ ΑΓΩΓΗ ΚΑΙ ΤΗΝ ΕΠΙΣΤΗΜΗ ΤΟΥ ΑΘΛΗΤΙΣΜΟΥ: ΚΟΙΝΟΠΟΙΗΣΗ ΒΕΛΤΙΣΤΩΝ ΠΡΑΚΤΙΚΩΝ ΣΤΟ ΠΛΑΙΣΙΟ ΤΟΥ EMERGE

Το **EMERGE European University Alliance** αποτελεί μία από τις Ευρωπαϊκές Πανεπιστημιακές Συμμαχίες της Ευρωπαϊκής Ένωσης, με στόχο την ενίσχυση της συνεργασίας και της διεθνούς παρουσίας των ευρωπαϊκών ιδρυμάτων ανώτατης εκπαίδευσης.

Στη συμμαχία συμμετέχουν εννέα πανεπιστήμια: το Δημοκρίτειο Πανεπιστήμιο Θράκης (Ελλάδα), το University of Limerick (Ιρλανδία), τα Université Bretagne Sud και Université Rennes 2 (Γαλλία), το University of A Coruña (Ισπανία), το Europa-Universität Flensburg (Γερμανία), το Matej Bel University (Σλοβακία), το Inland Norway University of Applied Sciences (Νορβηγία) και το Neapolis University Pafos (Κύπρος).

Κοινό τους χαρακτηριστικό αποτελεί η γεωγραφική τους θέση στην περιφέρεια, την οποία επιδιώκουν να μετατρέψουν σε πλεονέκτημα, ενισχύοντας τη συνεργασία στην εκπαίδευση, την έρευνα και τη σύνδεση με την κοινωνία.

EXPLORING COMMUNITY ENGAGEMENT IN PHYSICAL EDUCATION AND SPORT SCIENCE: SHARING BEST PRACTICES WITHIN EMERGE

The EMERGE European University Alliance is one of the European University Alliances of the European Union, aiming to strengthen collaboration and the international presence of higher education institutions across Europe.

The alliance brings together nine universities: Democritus University of Thrace (Greece), University of Limerick (Ireland), Université Bretagne Sud and Université Rennes 2 (France), University of A Coruña (Spain), Europa-Universität Flensburg (Germany), Matej Bel University (Slovakia), Inland Norway University of Applied Sciences (Norway), and Neapolis University Pafos (Cyprus).

A common characteristic of these institutions is their location on the geographical periphery, which they seek to transform into an advantage by fostering cooperation in education, research, and engagement with society.

ΑΘΛΗΤΙΚΟΙ ΣΥΛΛΟΓΟΙ ΠΑΛΗΣ: ΝΕΑ ΕΠΟΧΗ ΚΑΙ ΒΙΩΣΙΜΟΤΗΤΑ

Προεδρείο:

Ιωάννης Μπάρμπας, *ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Ομιλητές:

Νίκος Τσιακάρας, *ΤΕΦΑΑ, Πανεπιστήμιο Θεσσαλίας*

Βασίλειος Γεροδήμος, *Καθηγητής ΤΕΦΑΑ, Πανεπιστήμιο Θεσσαλίας*

Κωνσταντίνα Καρατράντου, *Αναπληρώτρια Καθηγήτρια ΤΕΦΑΑ, Πανεπιστήμιο Θεσσαλίας*

Περίληψη:

Η περίπτωση του ΑΠΣ Τρικάλων, οι νέες τάσεις στην αξιολόγηση και προπονητική των αθλητών πάλης των αναπτυξιακών ηλικιών και η συνιστώσα της έρευνάς στον αθλητισμό. Οι στρατηγικές και δράσεις για την προαγωγή της υγείας των νέων παλαιστών στην Ελλάδα.

WRESTLING SPORTS CLUBS: NEW ERA AND SUSTAINABILITY

Chair:

Ioannis Mparmpas, *D.P.E.S.S., Democritus University of Thrace Director of the Inter-institutional Postgraduate Program: "Clinical Exercise and Applications of Technology in Health"*

Speakers:

Nikos Tsiakaras, *DPESS, University of Thessaly*

Vassilios Gerodimos, *Professor DPESS, University of Thessaly*

Konstantina Karatrandou, *Associate Professor DPESS, University of Thessaly*

Abstract:

The case of APS Trikala, new trends in the evaluation and coaching of wrestling athletes of developmental ages and its co-research in sports. Strategies and actions for the promotion of the health of young wrestlers in Greece

ΒΑΡΙΑΤΡΙΚΗ – ΜΕΤΑΒΟΛΙΚΗ ΧΕΙΡΟΥΡΓΙΚΗ, ΔΙΑΤΡΟΦΗ ΚΑΙ ΑΣΚΗΣΗ

Προεδρείο:

Ελένη Δούδα, *Καθηγήτρια, Τ.Ε.Φ.Α.Α., Δημοκριτείου Πανεπιστημίου Θράκης Διευθύντρια του Δ.Π.Μ.Σ. «Κλινική Άσκηση και Εφαρμογές της Τεχνολογίας στην Υγεία»*

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Κωνσταντίνος Βόλακλης, *Αναπληρωτής Καθηγητής, Τ.Ε.Φ.Α.Α., Δημοκριτείου Πανεπιστημίου Θράκης*

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Βαριατρική-Μεταβολική Χειρουργική στη Θνησιγενή Παχυσαρκία

Τσατάλη Μαριάννα, *Κλινική Ψυχολόγος με ειδίκευση στην βαριατρική, Επιστημονική Συνεργάτης Κλινικής Νοσογόνου Παχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης*

Ολιστική ψυχολογική προσέγγιση και υποστήριξη πριν και μετά από ένα χειρουργείο νοσογόνου παχυσαρκίας

Μαριλένα Γιαννακοπούλου, *Κλινική διατροφολόγος, Επιστημονικός Συνεργάτης Κλινικής Νοσογόνου Παχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης*

Διατροφική Υποστήριξη του Βαριατρικού Ασθενούς

Αλέξιος Μπατρακούλης, *PhD, CSCS, ACSM-EP, FACSM, Επίκουρος Καθηγητής Εφαρμοσμένης και Κλινικής Φυσιολογίας της Άσκησης, Σχολή Θετικών Επιστημών, Τμήμα Επιστημών Ζωής, Ευρωπαϊκό Πανεπιστήμιο Κύπρου, Λευκωσία, Κύπρος*

Ο Ρόλος της Άσκησης στη Βαριατρική Χειρουργική

Θάλεια Μπελλάλη, *Καθηγήτρια, Τμήμα Νοσηλευτικής, Διεθνές Πανεπιστήμιο Ελλάδος / Επισκέπτρια Καθηγήτρια, Τμήμα Επιστημών Υγείας, Σχολή Θετικών Επιστημών, Ευρωπαϊκό Πανεπιστήμιο Κύπρου*

Από τη Συμμόρφωση στην Προσήλωση: Διεπιστημονική Διαχείριση της Παχυσαρκίας μέσα από το Βιοψυχοκοινωνικό Μοντέλο Υγείας

Περίληψη:

Στη παρούσα στρογγυλή τράπεζα θα συζητηθούν οι σύγχρονες επιστημονικές εξελίξεις στον τομέα της βαριατρικής χειρουργικής, η οποία αποτελεί τη θεραπεία εκλογής σε ασθενείς με νοσογόνο παχυσαρκία. Με βάση πρόσφατα ερευνητικά δεδομένα η διατήρηση ενός καλού μετεγχειρητικού αποτελέσματος προϋποθέτει τη διεπιστημονική παρακολούθηση του ασθενούς μετά το χειρουργείο έτσι ώστε να διατηρηθεί η απώλεια βάρους και να μειωθεί ο κίνδυνος απώλειας άλιπης μάζας σώματος. Θα παρουσιαστούν οι διατροφικές οδηγίες που δίνονται στους ασθενείς καθώς και οι οδηγίες και τα πρωτόκολλα άσκησης που εφαρμόζονται τόσο προ- όσο και μετεγχειρητικά. Ιδιαίτερη έμφαση αποδίδεται επίσης στη διάκριση ανάμεσα στη συμμόρφωση και την προσήλωση στις θεραπευτικές οδηγίες, καθώς η προσήλωση δεν αφορά στην παθητική αποδοχή οδηγιών, αλλά στην ενεργητική συμμετοχή του ατόμου με παχυσαρκία στη λήψη αποφάσεων, στη συνδιαμόρφωση εφικτών στόχων και στην από κοινού συμφωνία ενός πλάνου παρέμβασης που ανταποκρίνεται στις ανάγκες, τις δυνατότητες και τις προτεραιότητές του. Μέσα από αυτή την οπτική, η θεραπευτική συμμαχία ενισχύεται ουσιαστικά και δημιουργούνται ευνοϊκότερες προϋποθέσεις για τη μακροπρόθεσμη διατήρηση των αλλαγών στον τρόπο ζωής του. Υπό αυτό το πρίσμα, υποστηρίζεται ότι η διεπιστημονική, και όχι απλώς η πολυεπιστημονική ομάδα αποτελεί την πλέον κατάλληλη και αποτελεσματική προσέγγιση για τη διαχείριση της νοσογόνου παχυσαρκίας.

Με την υποστήριξη του Διϊδρυματικού Προγράμματος Μεταπτυχιακών Σπουδών: «Κλινική Άσκηση και Εφαρμογές της Τεχνολογίας στην Υγεία» του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού της Σχολής Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Δημοκριτείου Πανεπιστημίου Θράκης σε συνεργασία με το Εθνικό Κέντρο Έρευνας Φυσικών Επιστημών «ΔΗΜΟΚΡΙΤΟΣ» - Ινστιτούτο Πληροφορικής και Τηλεπικοινωνίων.

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

BARIATRIC-METABOLIC SURGERY, NUTRITION AND EXERCISE

Chair:

Helen Douda, *Professor, D.P.E.S.S., Democritus University of Thrace Director of the Inter-institutional Postgraduate Program: "Clinical Exercise and Applications of Technology in Health"*

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Speakers:

Ilias Sdralis, *General Surgeon, Director of Bariatric & Metabolic Disorders Surgery Department of Interbalkan Medical Center of Thessaloniki*

Bariatric-Metabolic Surgery in Morbid Obesity

Marilena Giannakopoulou, *Clinical Dietician, Bariatric & Metabolic Disorders Surgery Department of Interbalkan Medical Center of Thessaloniki*

Nutritional support of the bariatric patient

Marianna Tsatali, *Clinical Psychologist specializing in Bariatric Care, Scientific Collaborator of the Morbid Obesity & Metabolic Diseases Surgery Clinic, Inter-Balkan Medical Center of Thessaloniki*

Holistic psychological approach and support before and after bariatric surgery

Alexios Batrakoulis, PhD, CSCS, ACSM-EP, FACSM, Assistant Professor of Applied and Clinical Exercise Physiology, School of Sciences, Department of Life Sciences, European University Cyprus, Nicosia, Cyprus

The role of exercise in bariatric-metabolic surgery

Thaleia Bellali, *Professor, Department of Nursing, International Hellenic University / Adjunct Professor, Department of Health Sciences, School of Sciences, European University Cyprus*

From Compliance to Adherence: The Interdisciplinary Management of Obesity through the Biopsychosocial Model of Health

Abstract:

In the present roundtable, the modern scientific developments in the field of bariatric surgery will be discussed, which constitutes the treatment of choice for patients with morbid obesity. Based on recent scientific data, maintaining a good postoperative outcome requires interdisciplinary follow-up of the patient after surgery in order to sustain weight loss and reduce the risk of lean body mass loss. The dietary guidelines provided to patients, as well as the exercise instructions and protocols applied both pre- and post-operatively, will be presented and discussed. Particular emphasis is also placed on the distinction between compliance and adherence to therapeutic recommendations, as adherence does not involve the passive acceptance of instructions but rather the active participation of the individual with obesity in decision-making, the co-creation of achievable goals, and the joint agreement on an intervention plan that reflects their needs, capacities, and priorities. From this perspective, the therapeutic alliance is substantially strengthened, creating more favorable conditions for the long-term maintenance of lifestyle changes. In this light, it is argued that an interdisciplinary, rather than merely multidisciplinary team, constitutes the most appropriate and effective approach for the management of morbid obesity.

Postgraduate Program: "Clinical Exercise and Applications of Technology in Health" *of the Department of Physical Education and Sport of the School of Physical Education and Sport Science of Democritus University of Thrace in collaboration with the National Center for Science Research "DEMOKRITOS"- The Institute of Informatics and Telecommunications (IIT)*

Interinstitutional Postgraduate Studies Program
Clinical Exercise &
Technologies Application in Health

ΤΟ ΜΕΛΛΟΝ ΤΗΣ ΑΠΑΣΧΟΛΗΣΗΣ ΣΤΟΝ ΑΘΛΗΤΙΣΜΟ: ΕΥΡΩΠΑΪΚΑ ΔΕΔΟΜΕΝΑ ΚΑΙ ΝΕΕΣ ΠΡΟΟΠΤΙΚΕΣ

Προεδρείο:

Γεωργία Υφαντίδου, *Αναπληρώτρια Καθηγήτρια ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

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Ομιλητές:

Γεώργιος Πίγκος, *Προϊστάμενος της Διεύθυνσης Άθλησης για Όλους, Προβολής, Ανάπτυξης Αθλητισμού, Επιστημονικής Υποστήριξης και Διεθνών Σχέσεων της Γενικής Γραμματείας Αθλητισμού*

Ο Γεώργιος Πίγκος *είναι Προϊστάμενος της Διεύθυνσης Άθλησης για Όλους, Προβολής, Ανάπτυξης Αθλητισμού, Επιστημονικής Υποστήριξης και Διεθνών Σχέσεων της Γενικής Γραμματείας Αθλητισμού. Είναι υπεύθυνος για τον σχεδιασμό και την υλοποίηση προγραμμάτων μαζικής άθλησης και συμμετέχει στην ανάπτυξη εθνικών και ευρωπαϊκών πολιτικών αθλητισμού. Το έργο του επικεντρώνεται στην προώθηση της φυσικής δραστηριότητας, την ενίσχυση της καινοτομίας και τη βιώσιμη ανάπτυξη του αθλητισμού.*

Στυλιανός Ιγνατιάδης, *Θεματικός Αντιπεριφερειάρχης Αθλητισμού και Απασχόλησης στην Περιφέρεια Ανατολικής Μακεδονίας και Θράκης*

Ο Στυλιανός Ιγνατιάδης *είναι Θεματικός Αντιπεριφερειάρχης Αθλητισμού και Απασχόλησης στην Περιφέρεια Ανατολικής Μακεδονίας και Θράκης. Διαμένει στο Κοκκινόχωμα Καβάλας, όπου διετέλεσε Πρόεδρος της τοπικής κοινότητας από το 2014. Εργάζεται στη Δημόσια Υπηρεσία Απασχόλησης (Δ.ΥΠ.Α.) από το 2006 και διαθέτει σημαντική εμπειρία σε θέματα απασχόλησης και κοινωνικής πολιτικής. Παράλληλα, είναι πιστοποιημένος προπονητής ποδοσφαίρου με δίπλωμα UEFA A, συμβάλλοντας ενεργά στην ανάπτυξη του αθλητισμού σε τοπικό και περιφερειακό επίπεδο.*

Γεωργία Υφαντίδου, *Αναπληρώτρια Καθηγήτρια ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Η Γεωργία Υφαντίδου *είναι Αναπληρώτρια Καθηγήτρια με γνωστικό αντικείμενο «Οργάνωση και Διοίκηση Αθλητικού Τουρισμού και Αναψυχής» στο Τμήμα Επιστήμης Φυσικής Αγωγής & Αθλητισμού του Δημοκρίτειου Πανεπιστημίου Θράκης και Ιδρυματικά Υπεύθυνη Πρακτικής Άσκησης ΔΠΘ. Είναι κάτοχος διδακτορικού διπλώματος στον Αθλητικό Τουρισμό και διαθέτει δύο μεταπτυχιακούς τίτλους σπουδών, έναν στη Διεθνή Φιλοξενία και Τουρισμό και έναν στη Φυσική Δραστηριότητα και Αναψυχή. Επιπλέον, έχει συμμετάσχει σε πολυάριθμα ερευνητικά και αναπτυξιακά έργα στην Ευρωπαϊκή Ένωση.*

Σωτήρης Κυρανάκος, *Υποψήφιος Διδάκτωρ Οικονομικών στο Πανεπιστήμιο Πειραιά, Σύμβουλος Περιφερειακού προγραμματισμού της Ε.Ο.Ε, ex - CEO Αυθεντικού Μαραθωνίου Αθήνας*

Περίληψη:

Η απασχόληση στον τομέα του αθλητισμού στην Ευρώπη βρίσκεται σε φάση σημαντικού μετασχηματισμού, επηρεαζόμενη από κοινωνικές, οικονομικές και τεχνολογικές εξελίξεις. Η παρούσα συζήτηση βασίζεται σε πρόσφατα ευρωπαϊκά ερευνητικά δεδομένα που αναδεικνύουν τις σύγχρονες προκλήσεις και τις νέες μορφές απασχόλησης που αναδύονται στον αθλητικό τομέα. Παράγοντες όπως η ψηφιοποίηση, η ευελιξία στην εργασία, η αύξηση της μερικής απασχόλησης και η ανάπτυξη νέων επαγγελματικών ρόλων δημιουργούν ένα δυναμικό αλλά και απαιτητικό εργασιακό περιβάλλον. Παράλληλα, η ανάγκη για εξειδικευμένες δεξιότητες, η επαγγελματική κατάρτιση και η δια βίου μάθηση καθίστανται κρίσιμες για την προσαρμογή των επαγγελματιών στις νέες απαιτήσεις της αγοράς. Ιδιαίτερη έμφαση δίνεται επίσης στην ενίσχυση της απασχολησιμότητας των νέων, στην προώθηση της ισότητας των ευκαιριών και στη δημιουργία βιώσιμων και ποιοτικών θέσεων εργασίας στον αθλητισμό. Η ανάλυση των ευρωπαϊκών δεδομένων προσφέρει πολύτιμες πληροφορίες για τη διαμόρφωση πολιτικών και στρατηγικών που υποστηρίζουν την ανάπτυξη του ανθρώπινου δυναμικού και την καινοτομία στον αθλητικό τομέα. Ταυτόχρονα, αναδεικνύει τις ευκαιρίες που προκύπτουν από νέες μορφές απασχόλησης, όπως η επιχειρηματικότητα, οι ψηφιακές υπηρεσίες και οι διατομεακές συνεργασίες. Η κατανόηση αυτών των τάσεων είναι καθοριστική για την ενίσχυση της απασχόλησης, τη βελτίωση της ποιότητας της εργασίας και τη βιώσιμη ανάπτυξη του αθλητισμού στην Ευρώπη.

Με την υποστήριξη της Γενικής Γραμματείας Αθλητισμού & της Περιφέρειας Ανατολικής Μακεδονίας & Θράκης

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Υπουργείο Παιδείας, Θρησκευμάτων και Αθλητισμού
Γενική Γραμματεία Αθλητισμού

ΠΕΡΙΦΕΡΕΙΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΘΡΑΚΗΣ

THE FUTURE OF EMPLOYMENT IN SPORT: EUROPEAN EVIDENCE AND NEW PERSPECTIVES

Chair:

Georgia Yfantidou, *Associate Professor DPESS, Democritus University of Thrace*

gifantid@phyed.duth.gr

Speakers:

Georgios Pigos, *Head of the Directorate of Sport for All, Promotion, Sports Development, Scientific Support and International Relations at the General Secretariat of Sport, Greece*

Georgios Pigos *serves as Head of the Directorate of Sport for All, Promotion, Sports Development, Scientific Support and International Relations at the General Secretariat of Sport, Greece. He is responsible for the design and implementation of national sports participation programs and contributes to the development of sports policy and international cooperation initiatives. His work focuses on promoting physical activity, supporting innovation, and strengthening sustainable employment and development in the sports sector at national and European level.*

Stylianos Ignatiadis, *Deputy Regional Governor for Sports and Employment at the Region of Eastern Macedonia and Thrace*

Stylianos Ignatiadis *serves as Deputy Regional Governor for Sports and Employment at the Region of Eastern Macedonia and Thrace. He has been working at the Public Employment Service (DYPA) since 2006, gaining extensive experience in employment and social policy. He is also a certified UEFA A football coach and has actively contributed to the development of sport at local and regional level. His work focuses on promoting sports participation, strengthening employment opportunities, and supporting regional development through sport.*

Georgia Yfantidou, *Associate Professor DPESS, Democritus University of Thrace*

Georgia Yfantidou is an Associate Professor specializing in Organization and Management of Sport Tourism and Recreation at the Department of Physical Education and Sport Science, Democritus University of Thrace (DUTH). She serves as the Institutional Coordinator for Student Internship Programs at DUTH. She holds a PhD in Sport Tourism and two Master's degrees, one in International Hospitality and Tourism and another in Physical Activity and Recreation. Furthermore, she has participated in numerous research and development projects across the European Union.

Sotirios Kyranakos, *Ph.D Candidate in Economics, University of Piraeus, Hellenic Olympic Committee Advisor, ex - CEO "Athens Marathon.The Authentic"*

Abstract:

Employment in the sports sector in Europe is undergoing significant transformation, influenced by social, economic, and technological developments. This discussion draws on recent European research data highlighting current employment challenges and emerging forms of work within the sports industry. Factors such as digitalization, labor market flexibility, the growth of part-time and project-based work, and the emergence of new professional roles are shaping a dynamic yet demanding employment landscape. At the same time, the need for specialized skills, continuous professional training, and lifelong learning has become essential for professionals seeking to adapt to evolving labor market requirements. Particular emphasis is placed on enhancing youth employability, promoting equal opportunities, and fostering sustainable and quality jobs in sport. The analysis of European data provides valuable insights for the development of policies and strategic initiatives aimed at strengthening human capital and encouraging innovation within the sports sector. It also highlights new opportunities arising from innovative forms of employment, including entrepreneurship, digital services, and cross-sectoral collaboration. Understanding these trends is crucial for supporting employment growth, improving job quality, and ensuring the sustainable development of the sports sector across Europe.

With the support of:

HELLENIC REPUBLIC
Ministry of Education, Religious Affairs and Sports
General Secretariat of Sports

ΠΕΡΙΦΕΡΕΙΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΘΡΑΚΗΣ

ΑΠΟ ΤΗΝ ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΗΣ ΥΠΟΚΙΝΗΤΙΚΟΤΗΤΑΣ ΣΕ ΠΑΙΔΙΑ ΚΑΙ ΕΝΗΛΙΚΕΣ ΜΕΧΡΙ ΤΗ ΜΕΓΙΣΤΟΠΟΙΗΣΗ ΤΗΣ ΑΠΟΔΟΣΗΣ. ΣΤΟΧΟΙ, ΨΥΧΟΛΟΓΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ ΚΑΙ ΚΑΤΕΥΘΥΝΣΕΙΣ.

Προεδρείο:

Ευάγγελος Μπεμπέτσος, *Δημοκρίτειο Πανεπιστήμιο Θράκης*

Γιάννης Θεοδωράκης, *Πανεπιστήμιο Θεσσαλίας*

Ομιλητής:

Γιάννης Θεοδωράκης, *Πανεπιστήμιο Θεσσαλίας*

Ευάγγελος Μπεμπέτσος, *Δημοκρίτειο Πανεπιστήμιο Θράκης*

Όλγα Κούλη, *Δημοκρίτειο Πανεπιστήμιο Θράκης*

Περίληψη:

Η υποκινητικότητα, ο καθιστικός τρόπος ζωής και η κατάχρηση του διαδικτύου είναι παγκόσμια προβλήματα, και οι πρωτοβουλίες που αναλαμβάνονται από διεθνείς και εθνικούς οργανισμούς δεν επαρκούν για την αντιμετώπισή τους. Αποτελούν σοβαρή απειλή για τη δημόσια υγεία, καθώς τόσο τα παιδιά όσο και οι ενήλικες δεν πληρούν τις συνιστώμενες κατευθυντήριες γραμμές για τη φυσική δραστηριότητα. Εκτιμάται ότι οι απειλές για την υγεία για σχεδόν 500 εκατομμύρια ανθρώπους από το 2020 έως το 2030, θα μπορούσαν να μετριαστούν μέσω της αυξημένης φυσικής δραστηριότητας. Το παγκόσμιο οικονομικό κόστος των προβλημάτων υγείας που σχετίζονται με την υποκινητικότητα υπολογίζεται σε περίπου 47,6 δισεκατομμύρια δολάρια ετησίως. Στην ενότητα αυτή θα παρουσιασθούν οι απαραίτητες πρωτοβουλίες που πρέπει να αναλάβουν επιστημονικοί οργανισμοί, όπως τα πανεπιστήμια, σε εθνικό επίπεδο με βάση τις κατευθύνσεις της Παγκόσμιας Οργάνωσης Υγείας. Θα παρουσιαστούν παραδείγματα για τον σχεδιασμό προγραμμάτων άσκησης για υγεία σε όλες τις ηλικίες και το μάθημα της Φυσικής Αγωγής στο σχολείο, βασισμένα στη θεωρία των στόχων και άλλων ψυχολογικών στρατηγικών. Το θέμα θα κλείσει με την εξειδίκευση αυτών των παραδειγμάτων στον αγωνιστικό αθλητισμό. Οι ψυχολογικές στρατηγικές, ως εργαλεία σχεδιασμού, μπορεί να αξιοποιηθούν τόσο στην καταπολέμηση της υποκινητικότητας και του καθιστικού τρόπου ζωής, όσο και στη βελτίωση της ποιότητας ζωής και τη μεγιστοποίηση της απόδοσης. Παράλληλα, ο αγωνιστικός αθλητισμός μπορεί να εμπνεύσει τον γενικό πληθυσμό να ασχοληθεί περισσότερο με την άσκηση, και ταυτόχρονα, η αυξημένη συμμετοχή του πληθυσμού μπορεί να ενισχύσει τον αριθμό των ατόμων που συμμετέχουν στον αγωνιστικό αθλητισμό.

FROM ADDRESSING PHYSICAL INACTIVITY IN CHILDREN AND ADULTS TO MAXIMIZING PERFORMANCE. GOALS, PSYCHOLOGICAL STRATEGIES, AND GUIDELINES

Chair:

Evangelos Bebetsos, *Professor, DPESS, Democritus University of Thrace*

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Yannis Theodorakis, *University of Thessaly*

Speakers:

Yannis Theodorakis, *University of Thessaly*

Evangelos Bebetsos, *Professor, DPESS, Democritus University of Thrace*

Olga Kouli, *DPESS, Democritus University of Thrace*

Abstract:

Physical inactivity, sedentary behavior, and excessive internet use are global problems, and the initiatives undertaken by international and national organizations are insufficient to effectively address them. These issues pose a serious threat to public health, as both children and adults fail to meet the recommended guidelines for physical activity. It is estimated that health risks affecting nearly 500 million people between 2020 and 2030 could be mitigated through increased physical activity. The global economic cost of health problems related to physical inactivity is estimated at approximately 47.6 billion US dollars annually. This section will present the necessary initiatives that scientific organizations, such as universities, should undertake at the national level, based on the guidelines of the World Health Organization. Examples will be presented for the design of exercise-for-health programs across all age groups, as well as for Physical Education in schools, based on goal setting theory and other psychological strategies. The session will conclude with the adaptation of these examples to competitive sport. Psychological strategies, as planning tools, can be utilized both in combating physical inactivity and sedentary lifestyles and in improving quality of life and maximizing performance. At the same time, competitive sport can inspire the general population to engage more in physical activity, while increased population participation can, in turn, enhance the number of individuals involved in competitive sport.

ΒΙΩΣΙΜΟΤΗΤΑ ΤΩΝ ΑΘΛΗΤΙΚΩΝ ΟΡΓΑΝΙΣΜΩΝ: Ο ΡΟΛΟΣ ΤΟΥ ΜΑΡΚΕΤΙΝΓΚ ΚΑΙ ΤΟΥ ΜΑΝΑΤΖΜΕΝΤ ΣΤΗ ΔΙΑΜΟΡΦΩΣΗ ΤΟΥ ΜΕΛΛΟΝΤΟΣ ΤΟΥΣ

Προεδρείο:

Γεώργιος Κώστα , *ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Έφη Τσίτσκαρη, *ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

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Γιώργος Τζέτζης, *Καθηγητής ΤΕΦΑΑ., ΑΠΘ*

Jayden Kim, *Καθηγητής, College of Business, Kutztown University of Pennsylvania*

Περίληψη:

Η παρούσα στρογγυλή τράπεζα εστιάζει στον ολοένα και πιο κρίσιμο ρόλο του μάρκετινγκ και του μάνατζμεντ στη διαμόρφωση βιώσιμων αθλητικών οργανισμών και διοργανώσεων. Σε ένα περιβάλλον όπου οι απαιτήσεις για οικονομική ανθεκτικότητα, κοινωνική υπευθυνότητα και περιβαλλοντική ευαισθησία αυξάνονται, οι στρατηγικές που αναπτύσσονται στον χώρο του αθλητισμού καλούνται να ενσωματώσουν τη λογική της βιωσιμότητας σε όλα τα επίπεδα λειτουργίας. Μέσα από τρεις διαφορετικές αλλά συμπληρωματικές προσεγγίσεις, η συζήτηση αναδεικνύει τον τρόπο με τον οποίο η επιχειρηματικότητα και η τεχνολογία μπορούν να ενισχύσουν τη βιωσιμότητα των αθλητικών διοργανώσεων, με έμφαση στο δρομικό κίνημα, τον ρόλο του αθλητικού μάρκετινγκ στη δημιουργία μακροχρόνιας αξίας και σταθερότητας σε επαγγελματικές ομάδες καλαθοσφαίρισης, καθώς και τη συμβολή των ψηφιακών εφαρμογών fitness στη βιώσιμη λειτουργία γυμναστηρίων και fitness studios. Η στρογγυλή αυτή επιδιώκει να γεφυρώσει τη θεωρία με την πράξη, προσφέροντας ένα πολυδιάστατο πλαίσιο κατανόησης της βιωσιμότητας στον αθλητισμό. Παράλληλα, αναδεικνύει τη σημασία της καινοτομίας, της ψηφιακής μετάβασης και της στρατηγικής σκέψης ως βασικών μοχλών για τη δημιουργία ανθεκτικών και κοινωνικά υπεύθυνων αθλητικών οργανισμών, ικανών να ανταποκριθούν στις σύγχρονες προκλήσεις και να δημιουργήσουν μακροπρόθεσμη αξία για όλους τους εμπλεκόμενους φορείς.

SUSTAINABLE SPORT ORGANIZATIONS: THE ROLE OF MARKETING AND MANAGEMENT IN SHAPING THE FUTURE

Chair:

George Costa, *D.P.E.S.S., Democritus University of Thrace*

Efi Tsitskari, *D.P.E.S.S., Democritus University of Thrace*

Speakers:

Nickos Theodorakis, *Professor D.P.E.S.S. of Serres, AUTh*

George Tzetzis, *Professor D.P.E.S.S., A.U.Th.*

Jayden Kim, *Καθηγητής, College of Business, Kutztown University of Pennsylvania*

Abstract:

This roundtable discussion focuses on the increasingly critical role of marketing and management in shaping sustainable sports organizations and events. In an environment where the demand for financial resilience, social responsibility and environmental sensitivity is growing, strategies developed in the sports sector must incorporate sustainability principles at all levels of operation. The discussion highlights how entrepreneurship and technology can enhance the sustainability of sporting events through three distinct yet complementary approaches. These approaches focus on the running movement, the role of sports marketing in creating long-term value and stability for professional basketball teams, and the contribution of digital fitness apps to the sustainable operation of fitness clubs and studios. The roundtable discussion aims to bridge the gap between theory and practice by offering a multidimensional framework for understanding sustainability in sports. It also highlights the importance of innovation, digital transformation and strategic thinking as key drivers in creating resilient, socially responsible sports organizations that can respond to contemporary challenges and generate long-term value for all stakeholders.

ΤΕΧΝΗΤΗ ΝΟΗΜΟΣΥΝΗ ΣΤΗΝ ΥΓΕΙΑ ΚΑΙ ΤΗΝ ΑΘΛΗΤΙΚΗ ΕΠΙΣΤΗΜΗ: ΜΗΧΑΝΙΚΗ ΜΑΘΗΣΗ, ΥΠΟΛΟΓΙΣΤΙΚΗ ΟΡΑΣΗ ΚΑΙ ΕΠΕΞΗΓΗΣΙΜΑ ΣΥΣΤΗΜΑΤΑ ΛΗΨΗΣ ΑΠΟΦΑΣΕΩΝ

Προεδρείο:

Νικόλαος Βερναδάκης, *Καθηγητής, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Μαρία Γιαννούση, *Επίκουρη Καθηγήτρια, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Περίληψη:

Η παρούσα στρογγυλή τράπεζα εξετάζει τις σύγχρονες εφαρμογές της Τεχνητής Νοημοσύνης (ΤΝ) στην υγεία και την αθλητική επιστήμη μέσα από τρεις ισότιμους και αλληλένδετους θεματικούς άξονες, οι οποίοι αναδεικνύουν τη μετάβαση προς πιο ευφυή, προληπτικά και επεξηγήσιμα συστήματα υποστήριξης αποφάσεων.

Ο πρώτος άξονας αφορά τις θεμελιώδεις αρχές της μηχανικής μάθησης, με έμφαση στην επιβλεπόμενη μάθηση και στην ερμηνευσιμότητα των μοντέλων, στοιχείο κρίσιμο για την αξιοπιστία και την υιοθέτηση των συστημάτων σε κλινικά και εφαρμοσμένα περιβάλλοντα.

Ο δεύτερος άξονας επικεντρώνεται στη βαθιά μάθηση και την υπολογιστική όραση για την ανάλυση ανθρώπινης κίνησης και συμπεριφοράς. Περιλαμβάνει τεχνικές ανίχνευσης ανθρώπων και αντικειμένων, εκτίμησης στάσης σώματος για πρόβλεψη πτώσεων, αναγνώρισης δραστηριοτήτων, καθώς και ανάλυσης προσώπου για εκτίμηση συναισθημάτων και κόπωσης μέσω εξαγωγής χαρακτηριστικών σημείων.

Ο τρίτος άξονας εξετάζει τον μετασχηματισμό της αθλητικής επιστήμης μέσω της ΤΝ, όπου η ενσωμάτωση υπολογιστικής όρασης, φορητών τεχνολογιών και παραγωγικής ΤΝ επιτρέπει την προληπτική παρακολούθηση της απόδοσης, την πρόληψη τραυματισμών και την υποστήριξη της προπονητικής διαδικασίας.

Συνολικά, αναδεικνύεται ένα ενιαίο πλαίσιο συνεργασίας ανθρώπου και μηχανής, στο οποίο η ΤΝ λειτουργεί υποστηρικτικά προς την επιστημονική και επαγγελματική λήψη αποφάσεων, χωρίς να την αντικαθιστά.

Ομιλητές:

Γιώργος Παναγιώτου, *Αναπληρωτής Καθηγητής Εργοφυσιολογίας, Σχολή Θετικών Επιστημών, Τμήμα Επιστημών Ζωής, Ευρωπαϊκό Πανεπιστήμιο Κύπρου, Λευκωσία, Κύπρος*

Ο Γιώργος Παναγιώτου *είναι ακαδημαϊκός στη βαθμίδα του Αναπληρωτή Καθηγητή και Συντονιστής του Εργαστηρίου Άσκησης, Υγείας και Ανθρώπινης Απόδοσης και του*

Μεταπτυχιακού Προγράμματος Εφαρμοσμένης Αθλητικής Επιστήμης του Τμήματος Επιστημών Ζωής, της Σχολής Θετικών Επιστημών, του Ευρωπαϊκού Πανεπιστημίου Κύπρου. Εξειδικεύεται στον προσδιορισμό και ανάλυση της αθλητικής απόδοσης στο ποδόσφαιρο και γενικότερα στον ευρύτερο αθλητισμό υψηλού επιπέδου. Τα τελευταία 20 χρόνια, έχει συνεργαστεί με πληθώρα αθλητικών ποδοσφαιρικών σωματείων κυρίως στην Κύπρο αλλά και στο εξωτερικό, ενώ διατέλεσε Εργοφυσιολόγος και Διευθυντής Ιατρικών & Επιστημονικών Επιτελείων στην «ΑΕΛ Λεμεσού» (2008 – 2014) και στην «Ομόνοια Λευκωσίας» (2018 -2019).

Ιωάννης Κανσίζογλου, *Επίκουρος Καθηγητής στο Τμήμα Εργοθεραπείας, της Σχολής Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Δημοκρίτειο Πανεπιστήμιο Θράκης*

***Ο Ιωάννης Κανσίζογλου** είναι Επίκουρος Καθηγητής στο Τμήμα Εργοθεραπείας, της Σχολή Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας του Δημοκρίτειου Πανεπιστημίου Θράκης. Έλαβε το Δίπλωμά του στη Μηχανική Ηλεκτρονικών Υπολογιστών και Πληροφορικής από το Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης το 2017 και το διδακτορικό του στη βαθιά μάθηση αναπαραστάσεων και την υπολογιστική συναισθηματική νοημοσύνη από το Εργαστήριο Ρομποτικής και Αυτοματοποίησης του ΔΠΘ το 2021. Έχει προηγουμένως εργαστεί ως μεταδιδακτορικός ερευνητής στο ίδιο εργαστήριο, συμμετέχοντας σε ερευνητικά έργα που χρηματοδοτήθηκαν από την Ευρωπαϊκή Επιτροπή και την Ελληνική Κυβέρνηση. Τα ερευνητικά του ενδιαφέροντα περιλαμβάνουν υποστηρικτικές τεχνολογίες, υπολογιστική συναισθηματική νοημοσύνη, αλληλεπίδραση ανθρώπου–υπολογιστή και ρομποτική.*

Χρήστος Κοκκότης, *Επίκουρος Καθηγητής στο Τμήμα Εργοθεραπείας, της Σχολής Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Δημοκρίτειο Πανεπιστήμιο Θράκης*

***Ο Χρήστος Κοκκότης** είναι Επίκουρος Καθηγητής στο Τμήμα Εργοθεραπείας, της Σχολής Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας του Δημοκρίτειου Πανεπιστημίου Θράκης. Κατέχει διδακτορικό δίπλωμα στις εφαρμογές της Μηχανικής Μάθησης στην Ποιότητα Ζωής από το Πανεπιστήμιο Θεσσαλίας. Το ερευνητικό του έργο επικεντρώνεται στην ανάλυση κίνησης, σε δεδομένα χρονοσειρών, καθώς και στην ανάπτυξη μοντέλων μηχανικής και βαθιάς μάθησης στον τομέα της υγείας και της αποκατάστασης. Έχει ασχοληθεί με εφαρμογές όπως η πρόβλεψη οστεοαρθρίτιδας γόνατος, η αποκατάσταση μετά από εγκεφαλικό επεισόδιο και η παρακολούθηση της αποκατάστασης ρήξης πρόσθιου χιαστού συνδέσμου (ACL). Έχει συμβάλει σε ερευνητικά έργα στο ΚΕΤΕΑΘ (CERTH), στο πλαίσιο των προγραμμάτων OActive και SafeACL, ενώ συμμετέχει ενεργά σε έργα χρηματοδοτούμενα από το πρόγραμμα Horizon Europe. Το ερευνητικό του έργο στοχεύει στη γεφύρωση της Τεχνητής Νοημοσύνης με την κλινική πράξη, μέσω ερμηνεύσιμων και δεδομενο-κεντρικών προσεγγίσεων.*

Με την υποστήριξη του Διϊδρυματικού Προγράμματος Μεταπτυχιακών Σπουδών: «**Κλινική Άσκηση και Εφαρμογές της Τεχνολογίας στην Υγεία**» Δημοκρίτειο Πανεπιστήμιο Θράκης,

Σχολή Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Τ.Ε.Φ.Α.Α. και Εθνικό Κέντρο Έρευνας Φυσικών Επιστημών «ΔΗΜΟΚΡΙΤΟΣ» - Ινστιτούτο Πληροφορικής και Τηλεπικοινωνιών.

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

ARTIFICIAL INTELLIGENCE IN HEALTH AND SPORTS SCIENCE: MACHINE LEARNING, COMPUTER VISION, AND EXPLAINABLE DECISION-MAKING SYSTEMS

Chair:

Nikolaos Vernadakis, *Professor, Department of Physical Education and Sport Science, Democritus University of Thrace*

Maria Giannousi, *Assistant Professor, Department of Physical Education and Sport Science, Democritus University of Thrace*

Abstract:

This round table explores contemporary applications of Artificial Intelligence (AI) in health and sports science through three equal and interrelated thematic axes, highlighting the transition toward intelligent, proactive, and explainable decision-support systems.

The first axis addresses the fundamental principles of machine learning, with emphasis on supervised learning and model interpretability as essential factors for trust, transparency, and adoption in clinical and applied environments.

The second axis focuses on deep learning and computer vision for analyzing human motion and behavior, including human and object detection, pose estimation for fall prediction, human activity recognition, and facial analysis for emotion and fatigue assessment through landmark-based methods.

The third axis examines the transformation of sports science through AI, where the integration of computer vision, wearable technologies, and generative AI enables proactive performance monitoring, injury prevention, and enhanced coaching workflows.

Overall, the panel highlights a unified human–machine collaboration framework in which Artificial Intelligence supports rather than replaces scientific and professional decision-making.

Speakers:

George Panayiotou, *Associate Professor of Sport and Exercise Physiology, School of Sciences, Department of Life Sciences, European University Cyprus, Nicosia, Cyprus*

***George Panagiotou** is an academic at the rank of Associate Professor and serves as Coordinator of the Exercise, Health and Human Performance Laboratory as well as the Master's Programme in Applied Sport Science at the Department of Life Sciences, Faculty of Pure and Applied Sciences, European University Cyprus. He specializes in the assessment and analysis of athletic performance in football and in high-performance sport more broadly. Over*

the past 20 years, he has collaborated with numerous football clubs in Cyprus and abroad. He has served as Exercise Physiologist and Director of Medical and Scientific Staff at AEL Limassol (2008–2014) and at AC Omonia Nicosia (2018–2019).

Ioannis Kansizoglou, *Assistant Professor at the Department of Occupational Therapy, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace*

***Ioannis Kansizoglou** is an Assistant Professor at the Department of Occupational Therapy, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace. He received his Diploma in Electrical and Computer Engineering from the Aristotle University of Thessaloniki in 2017 and his Ph.D. in deep representation learning and affective computing from the Laboratory of Robotics and Automation, DUTH, in 2021. He has previously served as a Postdoctoral Researcher at the same laboratory, contributing to projects funded by the European Commission and the Greek Government. His research interests include assistive technologies, affective computing, human–computer interaction, and robotics.*

Christos Kokkotis, *Assistant Professor at the Department of Occupational Therapy, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace*

***Dr. Christos Kokkotis** is an Assistant Professor at the Department of Occupational Therapy, School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace. He holds a PhD in Machine Learning applications in Quality of Life from the University of Thessaly. His research focuses on motion analysis, time-series data, and the development of machine learning and deep learning models in healthcare and rehabilitation. He has worked on applications including knee osteoarthritis prediction, stroke recovery, and ACL rehabilitation monitoring. He has also contributed to research projects at CERTH within the OActive and SafeACL programs. Dr. Kokkotis is actively involved in Horizon-funded projects and his work aims to bridge AI and clinical practice through interpretable and data-driven solutions.*

Postgraduate Program: "**Clinical Exercise and Applications of Technology in Health**" Department of Physical Education and Sport Science of the School of Physical Education, Sport Science and Occupational Therapy of Democritus University of Thrace in collaboration with the National Center for Science Research "DEMOKRITOS" - The Institute of Informatics and Telecommunications (IIT)

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

ΣΕΜΙΝΑΡΙΑ
WORKSHOPS

ΕΚΠΑΙΔΕΥΤΙΚΟ ΠΡΟΓΡΑΜΜΑ «BLS BASIC LIFE SUPPORT (ΒΑΣΙΚΗ ΥΠΟΣΤΗΡΙΞΗ ΖΩΗΣ)»

Περιγραφή:

Το πρόγραμμα εκπαίδευσης δημιουργήθηκε το 2008 και αποσκοπεί στην αύξηση του αριθμού των εκπαιδευμένων πολιτών στις παρακάτω ενότητες:

- Καρδιοαναπνευστική Αναζωογόνηση “ΚΑΑ” (Ενήλικα - Παιδιού - Βρέφους)
- Αυτόματου Εξωτερικού Απινιδιστή “ΑΕΑ - AED” (Ενήλικα - Παιδιού - Βρέφους)
- Απόφραξη Αεραγωγού “Πνιγμονή” ΛΑΒΗ HEIMLICH (Ενήλικα - Παιδιού - Βρέφους)
- Θέση Ανανηψης (Ενήλικα - Παιδιού - Βρέφους)
- Φαρμακείο Α' Βοηθειών

Αξιολόγηση

Υλοποιείται από πιστοποιημένους Εκπαιδευτές του Τομέα Σαμαρειτών, Διασωστών και Ναυαγοσωστών του Ελληνικού Ερυθρού Σταυρού με ειδικότητα “ΕΚΠΑΙΔΕΥΤΗ ΠΡΩΤΩΝ ΒΟΗΘΕΙΩΝ και CPR/AED”, με ύλη προσαρμοσμένη, εναρμονισμένη και σύμφωνη με τις τελευταίες οδηγίες του Ευρωπαϊκού Συμβουλίου Αναζωογόνησης (ERC). Πραγματοποιείται θεωρητική και πρακτική εξάσκηση στην Καρδιοαναπνευστική Αναζωογόνηση και τη χρήση Αυτόματου Εξωτερικού Απινιδιστή σε εξειδικευμένα προπλάσματα και εκπαιδευτικούς απινιδιστές.

*Ισχύει για τη Γενική Γραμματεία Αθλητισμού (ΓΓΑ) και τη Δράση «Νταντάδες της γειτονιάς»

Διάρκεια 6 ώρες (1 ημέρα)

Για όσες και όσους ενδιαφέρονται να αξιοποιήσουν τον αθλητισμό ως μέσο ένταξης και ενδυνάμωσης για παιδιά με αναπηρίες.

Εισηγητής:

Ομάδα ΕΛΛΗΝΙΚΟΥ ΕΡΥΘΡΟΥ ΣΤΑΥΡΟΥ-ΠΕΡΙΦΕΡΕΙΑΚΟΥ ΤΜΗΜΑΤΟΣ ΚΟΜΟΤΗΝΗΣ

Το Περιφερειακό Τμήμα Κομοτηνής του Ελληνικού Ερυθρού Σταυρού αποτελεί ενεργό πυρήνα ανθρωπιστικής δράσης στην Περιφερειακή Ενότητα Ροδόπης, προωθώντας τις θεμελιώδεις αρχές του Διεθνούς Κινήματος Ερυθρού Σταυρού και Ερυθράς Ημισελήνου: ανθρωπιά, αμεροληψία, ουδετερότητα, ανεξαρτησία, εθελοντισμό, ενότητα και οικουμενικότητα. Με επίκεντρο τον άνθρωπο και τις ανάγκες της τοπικής κοινωνίας, το Τμήμα αναπτύσσει δράσεις κοινωνικής πρόνοιας και αλληλεγγύης, στηρίζοντας ευάλωτες ομάδες και οικογένειες που αντιμετωπίζουν δυσκολίες. Ιδιαίτερη έμφαση δίνεται στην εκπαίδευση πολιτών σε Πρώτες Βοήθειες, Καρδιοαναπνευστική Αναζωογόνηση (ΚΑΑ/CPR) και χρήση Αυτόματου Εξωτερικού Απινιδιστή (AED), μέσω πιστοποιημένων εκπαιδευτών του Τομέα Σαμαρειτών, Διασωστών και Ναυαγοσωστών. Παράλληλα, οι εθελοντές του

συμμετέχουν σε υγειονομικές καλύψεις εκδηλώσεων, δράσεις πρόληψης και παρεμβάσεις σε καταστάσεις εκτάκτου ανάγκης. Το Τμήμα Κομοτηνής λειτουργεί ως σημείο αναφοράς για τον εθελοντισμό στην περιοχή, ενθαρρύνοντας τη συμμετοχή νέων και ενηλίκων σε ανθρωπιστικές πρωτοβουλίες. Με συνέπεια και διαρκή παρουσία στην τοπική κοινωνία, συμβάλλει ουσιαστικά στην ενίσχυση της κοινωνικής συνοχής και της κουλτούρας προσφοράς.

Ελληνικός
Ερυθρός Σταυρός

EDUCATIONAL PROGRAM "BLS BASIC LIFE SUPPORT"

Workshop Director:

Konstantinos Imanimidis,*Chief of the Hellenic Red Cross – Komotini Regional Branch Team*

Description

- The training program was established in 2008 and aims to increase the number of trained citizens in the following areas:
- Cardiopulmonary Resuscitation “CPR” (Adult – Child – Infant)
- Automated External Defibrillator “AED” (Adult – Child – Infant)
- Airway Obstruction “Choking” – HEIMLICH MANEUVER (Adult – Child – Infant)
- Recovery Position (Adult – Child – Infant)
- First Aid Kit

Assessment

It is delivered by certified instructors of the Samaritans, Rescuers, and Lifeguards Division of the Hellenic Red Cross, specialized as “FIRST AID and CPR/AED INSTRUCTORS.” The curriculum is adapted, harmonized, and aligned with the latest guidelines of the European Resuscitation Council (ERC). Both theoretical and practical training are provided in Cardiopulmonary Resuscitation and the use of an Automated External Defibrillator, using specialized manikins and training defibrillators.

Applicable for the General Secretariat of Sports and the “Neighborhood Nannies” initiative.

Duration: 6 hours (1 day)

Instructors:

Hellenic Red Cross – Komotini Regional Branch Team

The Komotini Regional Branch of the Hellenic Red Cross is an active humanitarian unit serving the Regional Unit of Rodopi, promoting the fundamental principles of the International Red Cross and Red Crescent Movement: humanity, impartiality, neutrality, independence, voluntary service, unity, and universality. With a people-centered approach, the branch develops social welfare and humanitarian initiatives, supporting vulnerable individuals and families facing social and economic challenges. Special emphasis is placed on public education and preparedness through certified First Aid training programs, including Cardiopulmonary Resuscitation (CPR) and the use of Automated External Defibrillators (AED), delivered by qualified instructors from the Samaritans, Rescuers, and Lifeguards Division. In addition, trained volunteers participate in first aid coverage of public events, prevention campaigns,

and emergency response activities within the local community. The Komotini Regional Branch serves as an important hub for volunteerism, encouraging citizens of all ages to actively participate in humanitarian actions and community service. Through its continuous presence and commitment, the branch contributes significantly to strengthening social cohesion, promoting public safety, and fostering a culture of solidarity and humanitarian values in the wider Komotini area.

Ελληνικός
Ερυθρός Σταυρός

ΑΝΑΚΑΛΥΠΤΟΝΤΑΣ ΤΟΝ ΟΙΝΟ: ΜΙΑ ΠΡΩΤΗ ΓΟΥΛΙΑ ΣΤΟΝ ΚΟΣΜΟ ΤΗΣ ΓΕΥΣΙΓΝΩΣΙΑΣ!

Περιγραφή:

Ένα διαδραστικό σεμινάριο γευσιγνωσίας για εσάς που θέλετε να γνωρίσετε τον κόσμο του οίνου με απλό, κατανοητό και απολαυστικό τρόπο, χωρίς να χρειάζεται προηγούμενη εμπειρία. Μέσα από μια φιλική και βιωματική εμπειρία, θα κάνετε τα πρώτα σας βήματα στη γευσιγνωσία, γνωρίζοντας τη βασική «τριπλέτα» της δοκιμής (όψη, άρωμα, γεύση) και ανακαλύπτοντας πώς να απολαμβάνετε τον οίνο με χαλαρό τρόπο. Θα ταξιδέψουμε μαζί στην Ανατολική Μακεδονία και Θράκη, γνωρίζοντας την ιστορία, τις ποικιλίες και τη μοναδικότητα της περιοχής, μέσα από τη σύνδεση του οίνου με τον τόπο και τους ανθρώπους του. Παράλληλα, θα πάρετε πρακτικές συμβουλές για το πώς να επιλέγετε τον οίνο που σας ταιριάζει, τις σωστές θερμοκρασίες σερβιρίσματος, βασικούς κανόνες απόλαυσης του οίνου και ιδέες για συνδυασμούς με φαγητό, είτε σε ένα φιλικό τραπέζι είτε σε ένα εστιατόριο. Στόχος είναι να αφήσουμε πίσω τα στερεότυπα που θέλουν τον οίνο δύσκολο ή «για τους λίγους» και να το φέρουμε πιο κοντά στην καθημερινότητά σας. Να δείτε πως ο οίνος δεν είναι μόνο αυτό που υπάρχει στο ποτήρι, αλλά η εμπειρία, η στιγμή και οι άνθρωποι με τους οποίους επιλέγετε να το μοιραστείτε.

Εισηγήτρια:

Σίσσυ Τζελεπίδου, *Πιστοποιημένη Sommelier (WSET Level 3 Award in Wines)*

Η Σίσσυ Τζελεπίδου είναι πιστοποιημένη Sommelier (WSET Level 3 Award in Wines) με πολυετή εμπειρία σε ηγετικές θέσεις στον εταιρικό χώρο. Συνδυάζοντας την πολύχρονη γνώση της στον οίνο με την επαγγελματική της πορεία, δημιουργεί εμπειρίες γευσιγνωσίας που συνδέουν τη μάθηση με την απόλαυση και την ανθρώπινη επαφή. Με βασική της φιλοσοφία ότι ο οίνος πρέπει να είναι προσιτός και κατανοητός σε όλο τον κόσμο, προσεγγίζει τη γευσιγνωσία με απλή, καθημερινή γλώσσα, βοηθώντας το κοινό να νιώσει άνετα και να ανακαλύψει τη δική του σχέση με τον οίνοί. Στόχος της είναι να γεφυρώσει τον κόσμο της εξειδικευμένης γνώσης με την αυθεντική απόλαυση, μετατρέποντας κάθε ποτήρι οίνου σε μια εμπειρία που συνδέεται με στιγμές, ανθρώπους και ιστορίες.

WINE: A FIRST SIP INTO THE WORLD OF WINE TASTING!

Description:

An interactive wine tasting seminar for those who want to explore the world of wine in a simple, enjoyable, and approachable way with no prior experience required. Through a relaxed and hands-on experience, you will take your first steps in wine tasting, learning the basic "trilogy" of tasting (appearance, aroma, taste) and gaining confidence in how to taste and choose wine. Together, we will travel to Eastern Macedonia and Thrace, discovering local grape varieties, the history of the region, and the unique stories behind each wine, connecting wine with its place and people. At the same time, you will receive practical tips on how to choose the right wine for you, proper serving temperatures, and simple guidelines for enjoying wine, whether at a friendly gathering or in a restaurant. Forget the rules and the stereotypes. Wine is not just for experts, it is for everyone. Join us and discover it together, one glass at a time!

Instructor:

Sissy Tzelepidou, *Certified Sommelier (WSET Level 3 Award in Wines)*

Sissy Tzelepidou is a certified Sommelier (WSET Level 3 Award in Wines) with extensive experience in leadership roles in the corporate world. Combining her deep understanding of wine with her professional background, she designs wine tasting experiences that bring together learning, enjoyment, and human connection. With a core belief that wine should be accessible and approachable to everyone, she presents wine in a simple, everyday language, helping people feel comfortable and discover their own personal relationship with it. Her goal is to bridge the gap between expertise and authentic enjoyment, turning every glass of wine into an experience connected with moments, people, and stories.

1Ο ΣΕΜΙΝΑΡΙΟ ΚΑΡΔΙΑΚΗΣ ΑΠΟΚΑΤΑΣΤΑΣΗΣ

1ο Σεμινάριο Καρδιακής Αποκατάστασης του Εργαστηρίου Κλινικής Εργοφυσιολογίας & Φυσιολογίας της Άσκησης του ΤΕΦΑΑ του ΔΠΘ, σε συνεργασία με την Καρδιολογική Κλινική της Ιατρικής Σχολής του Πανεπιστημίου Κρήτης

Υπεύθυνος Σεμιναρίου:

Κωνσταντίνος Βόλακλης *Αναπληρωτής Καθηγητής, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης ΤΕΦΑΑ – ΔΠΘ, Lecturer, Ergoline Academy, Germany*

Διευθυντές Σεμιναρίου:

Σάββας Τοκμακίδης *Ομότιμος Καθηγητής, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Μαρία Μαρκέτου *Αναπληρώτρια Καθηγήτρια Καρδιολογίας, Ιατρική Σχολή, Πανεπιστημίου Κρήτης*

Περιγραφή

Σκοπός του σεμιναρίου είναι να παρουσιάσει την οργανωτική δομή και τα περιεχόμενα ενός προγράμματος καρδιακής αποκατάστασης όπως αυτό εφαρμόζεται με βάση τις σύγχρονες κατευθυντήριες οδηγίες. Θα γίνει αναφορά στη διαστρωμάτωση του καρδιαγγειακού κινδύνου, τη φαρμακευτική αγωγή και στην αξιολόγηση του λιπιδαιμικού προφίλ (με έμφαση στη μείωση της LDL-C). Επιπλέον, θα γίνει επίδειξη της καρδιοαναπνευστικής κόπωσης με ερμηνεία των βασικών της αποτελεσμάτων και συνταγογράφηση της άσκησης. Τέλος, θα παρουσιαστούν οι διατροφικές οδηγίες και η μεθοδολογία διατροφικής παρακολούθησης των καρδιοπαθών ασθενών. Στο πρακτικό μέρος θα εφαρμοστούν πρωτόκολλα συνεχόμενης και διαλειμματικής άσκησης και θα γίνει παρουσίαση του λογισμικού ers.2 που χρησιμοποιείται για την ΗΚΓ-ική παρακολούθηση των ασθενών και τον έλεγχο ισχαιμίας και αρρυθμιών.

Θεωρητικό Μέρος

Ορισμός και περιεχόμενα της καρδιακής αποκατάστασης

Κωνσταντίνος Βόλακλης, *Αναπληρωτής Καθηγητής, Άσκηση σε Καρδιομεταβολικούς Ασθενείς, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Φαρμακευτική αγωγή στην καρδιακή Αποκατάσταση και αλληλεπίδρασή της με την άσκηση

Μαρία Μαρκέτου, *Αναπληρώτρια Καθηγήτρια Καρδιολογίας, Ιατρική Σχολή Πανεπιστημίου Κρήτης*

Διατροφική υποστήριξη στην καρδιακή αποκατάσταση

Ελένη Παυλίδου, *Ph.D, Κλινική διαιτολόγος-διατροφολόγος, Μεταδιδακτορική ερευνήτρια, Πανεπιστήμιο Αιγαίου*

Πρακτικό Μέρος

Διεξαγωγή καρδιοαναπνευστικής δοκιμασίας κόπωσης και συνταγογράφηση άσκησης

Μαρία Μαρκέτου, *Αναπληρώτρια Καθηγήτρια Καρδιολογίας, Ιατρική Σχολή Πανεπιστημίου Κρήτης*

Ηλίας Σμήλιος. *Καθηγητής Αθλητικής Φυσιολογίας, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Επίδειξη software ηλεκτροκαρδιογραφικής παρακολούθησης με χρήση του συστήματος ergoline ers.2 (συνεχόμενη και διαλειμματική άσκηση)

Κωνσταντίνος Βόλακλης, *Αναπληρωτής Καθηγητής, Άσκηση σε Καρδιομεταβολικούς Ασθενείς, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Σπάσης Απόστολος, *Κλινικός Εργοφυσιολόγος, Μέλος ΕΕΠ, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Σύνοψη-συζήτηση

Βιογραφικά εισηγητών:

*Ο **Κων/νος Βόλακλης** είναι Αναπληρωτής Καθηγητής στο ΤΕΦΑΑ του ΔΠΘ με γνωστικό αντικείμενο την άσκηση σε ασθενείς με καρδιομεταβολικές παθήσεις. Παρουσιάζει σημαντική ερευνητική και διδακτική εμπειρία στον τομέα της καρδιακής αποκατάστασης έχοντας εργαστεί σε κέντρα καρδιακής αποκατάστασης στο εξωτερικό.*

*Η **Μαρία Μαρκέτου** είναι Αναπληρώτρια Καθηγήτρια Καρδιολογίας στην Ιατρική Σχολή του Πανεπιστημίου Κρήτης και διατελεί πρόεδρος της ομάδας εργασίας αρτηριακής υπέρτασης της Ελληνικής Καρδιολογικής Εταιρείας. Είναι διευθύντρια του μοναδικού στην Ελλάδα αγγλόφωνου προγράμματος μεταπτυχιακών σπουδών με ειδίκευση στην καρδιακή αποκατάσταση.*

*Ο **Ηλίας Σμήλιος** είναι Καθηγητής Αθλητικής Φυσιολογίας στο ΤΕΦΑΑ του ΔΠΘ παρουσιάζοντας σημαντικό ερευνητικό και διδακτικό έργο στον τομέα της εργοσπιρομετρίας και της προπονητικής καθηδήγησης αθλητών υψηλού επιπέδου.*

*Ο **Απόστολος Σπάσης** είναι Κλινικός Εργοφυσιολόγος και μέλος ΕΕΠ στο ΤΕΦΑΑ του ΔΠΘ και παρουσιάζει πολύχρονη εμπειρία στη συνταγογράφηση και στην υλοποίηση προγραμμάτων άσκησης ασθενών με χρόνιες παθήσεις έχοντας εκπονήσει μεταδιδακτορική έρευνα στην άσκηση καρδιοπαθών.*

*Η **Ελένη Παυλίδου** είναι Κλινική Διαιτολόγος - Διατροφολόγος με διδακτορικό τίτλο από το Πανεπιστήμιο Αιγαίου και μεταδιδακτορική έρευνα (Post-Doc) στον τομέα του Μεταβολισμού. Το επιστημονικό της έργο εστιάζει στη διατροφική διαχείριση χρόνιων νοσημάτων και μεταβολικών διαταραχών.*

16ο Θεματικό Σεμινάριο του Διϊδρυματικού Προγράμματος Μεταπτυχιακών Σπουδών*:*

«Κλινική Άσκηση και Εφαρμογές της Τεχνολογίας στην Υγεία»

Δημοκρίτειο Πανεπιστήμιο Θράκης, Σχολή Επιστήμης Φυσικής Αγωγής και Αθλητισμού και Εργοθεραπείας, Τ.Ε.Φ.Α.Α. και Εθνικό Κέντρο Έρευνας Φυσικών Επιστημών «ΔΗΜΟΚΡΙΤΟΣ» - Ινστιτούτο Πληροφορικής και Τηλεπικοινωνιών

Σύλλογος Στήριξης και Αποκατάστασης Καρδιοπαθών και Πρόληψης Καρδιοπαθειών Νομού Ροδόπης

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

1ST CARDIAC REHABILITATION SEMINAR

1st Cardiac Rehabilitation Seminar of the Laboratory of Clinical Exercise Physiology, *D.P.E.S.S,* in cooperation with the Department of Cardiology, Medical School, University of Crete

Workshop Coordinator:

Konstantinos Volaklis, *Associate Professor, D.P.E.S.S., Democritus University of Thrace, Lecturer, Ergoline Academy, Germany*

Workshop Directors:

Savvas Tokmakidis, *Emeritus Professor of Exercise Physiology,. D.P.E.S.S. - Democritus University of Thrace*

Maria Marketou, *Associate Professor of Cardiology, Medical School, University of Crete*

Description

The purpose of the seminar is to present the structure and the contents of a cardiac rehabilitation program as it is applies based on current scientific guidelines. Issues such as cardiovascular risk stratification, the pharmacological treatment and the assessment of the lipid profile (with an emphasis on reducing LDL-C) will be mentioned. Additionally, there will be a demonstration of cardiopulmonary exercise testing with interpretation of the main results and exercise prescription guidance. The dietary recommendations and the nutritional monitoring procedure of cardiac patients will be also presented. In the practical part, continuous and interval exercise protocols will be applied using the ers.2 ECG monitoring software which is developed for the assessment of ischemia and arrhythmias of cardiac patients.

Theory

Definition and contents of cardiac rehabilitation

Konstantinos Volaklis, *Associate Professor, Exercise in Cardiometabolic Disease, D.P.E.S.S. - Democritus University of Thrace*

Medication used in cardiac rehabilitation und interactions with exercise

Maria Marketou, *Associate Professor of Cardiology, Medical School, University of Crete*

Dietary guidance and support of cardiac patients

Eleni Pavlidou, *Ph.D, Clinical Dietitian, Post-doc Researcher, Aegean University*

Practical Section

Cardiopulmonary exercise testing and exercise prescription

Maria Marketou, *Associate Professor of Cardiology, Medical School, University of Crete*

Ilias Smilios, *Professor of Exercise Physiology, D.P.E.S.S., Democritus University of Thrace*

ECG-monitoring during continuous moderate and high intensity interval exercise

Konstantinos Volaklis, *Associate Professor, Exercise in Cardiometabolic Disease, D.P.E.S.S. - Democritus University of Thrace*

Apostolos Spassis, *Clinical Exercise Physiologist, Specialized Teaching Staff, D.P.E.S.S., Democritus University of Thrace*

Summary and Discussion

Speakers' Cvs

Konstantinos Volaklis *is an Associate Professor at the School of Physical Education and Sport Science of Democritus University of Thrace, with expertise in exercise for patients with cardiometabolic diseases. He has significant research and teaching experience in the field of cardiac rehabilitation, having worked in cardiac rehabilitation centers abroad.*

Maria Marketou *is an Associate Professor of Cardiology at the Medical School of the University of Crete and serves as President of the Hypertension Working Group of the Hellenic Society of Cardiology. She is also the Director of the only English-taught postgraduate program in Greece specializing in cardiac rehabilitation.*

Ilias Smilios *is a Professor of Exercise Physiology at the School of Physical Education and Sport Science of Democritus University of Thrace, with significant research and teaching activity in the field of cardiopulmonary exercise testing and the training of high-performance athletes.*

Apostolos Spasis *is a Clinical Exercise Physiologist and a member of the Laboratory Teaching Staff at the School of Physical Education and Sport Science of Democritus University of Thrace. He has extensive experience in prescribing and implementing exercise programs for patients with chronic diseases and has conducted postdoctoral research in exercise interventions for cardiac patients.*

Eleni Pavlidou *is a Clinical Dietitian–Nutritionist with a PhD from the University of the Aegean and postdoctoral research in the field of metabolism. Her scientific work focuses on the nutritional management of chronic diseases and metabolic disorders.*

16th Thematic Seminar of the Postgraduate Program: "Clinical Exercise and Applications of Technology in Health"

Department of Physical Education and Sport Science of the School of Physical Education and Sport Science and Occupational Therapy of Democritus University of Thrace in collaboration with the **National Center for Science Research "DEMOKRITOS" - The Institute of Informatics and Telecommunications (IIT)**

Association for the **Support and Rehabilitation of Heart Disease and Prevention of Cardiovascular Disease of Rodopi**

Interinstitutional Postgraduate Studies Program
Clinical Exercise &
Technologies Application in Health

ΣΥΓΧΡΟΝΕΣ ΠΡΟΣΕΓΓΙΣΕΙΣ ΣΤΟ ΤΑΕΚΒΟΝΤΟ: ΠΡΟΠΟΝΗΤΙΚΗ, ΑΓΩΝΙΣΤΙΚΗ ΑΝΑΛΥΣΗ, ΠΟΥΜΣΕ ΚΑΙ (MENTORING) ΚΑΘΟΔΗΓΗΣΗ

Υπεύθυνος Σεμιναρίου:

Χρήστος Ορμανλίδης, *(MSc) Αποσπασμένος Καθηγητής Ειδικότητας, ΤΕΦΑΑ – ΔΠΘ,*

Περιγραφή:

Το σεμινάριο «Σύγχρονες προσεγγίσεις στο Ταεκβοντό: προπονητική, αγωνιστική ανάλυση, πούμσε και καθοδήγηση (mentoring)» στοχεύει στην ολοκληρωμένη παρουσίαση των βασικών διαστάσεων του σύγχρονου Ταεκβοντό, συνδυάζοντας επιστημονική γνώση, προπονητική πρακτική και εμπειρία υψηλού επιπέδου. Μέσα από μια δομημένη και πολυδιάστατη προσέγγιση, οι συμμετέχοντες θα γνωρίσουν τις αρχές της σύγχρονης προπονητικής, θα κατανοήσουν την αγωνιστική ανάλυση και τις απαιτήσεις του σύγχρονου αγώνα, θα εξοικειωθούν με τα τεχνικά χαρακτηριστικά και τη διδακτική προσέγγιση των πούμσε. Ιδιαίτερη έμφαση δίνεται στον ρόλο της καθοδήγησης (mentoring) και της βιωματικής εμπειρίας στην ανάπτυξη του αθλητή, αναδεικνύοντας τη σημασία της μεταφοράς γνώσης και αξιών από τον αθλητισμό υψηλού επιπέδου στην προπονητική πράξη. Το σεμινάριο συνδυάζει θεωρητική τεκμηρίωση με πρακτικές εφαρμογές, προσφέροντας μια ολοκληρωμένη και σύγχρονη προσέγγιση του Ταεκβοντό ως ολυμπιακού αθλήματος και ως μέσου εκπαίδευσης.

Εισηγητές:

Μιχάλης Μουρούτσος, *Χρυσός Ολυμπιονίκης Ταεκβοντό*

Χρυσός Ολυμπιονίκης το 2000 στο Σίδνεϊ στην κατηγορία 58 κιλά.

Χρυσός Πρωταθλητής Ευρώπης 2000 Ανδρών.

Ασημένιος στο Ευρωπαϊκό Πρωτάθλημα Ολυμπιακών κατηγοριών 1999.

Χάλκινο Ευρωπαϊκό Πρωτάθλημα Εφήβων Πάτρα 1997.

Χάλκινος Παγκόσμιος Πρωταθλητής (Ολυμπιακή Πανεπιστημιάδα) στη Σμύρνη το 2005.

Χάλκινος Παγκόσμιος Πρωταθλητής στο Παγκόσμιο Ενόπλων Δυνάμεων 2006 Κορέα.

2 φορές Χρυσός Βαλκανιονίκης 1997 και 1998.

4 φορές 5ος στα Παγκόσμια Πρωταθλήματα 1997 Χονγκ Κονγκ, 2001 Κορέα, 2003 Γκάρμις Γερμανία και 2005 Μαδρίτη Ισπανία.

Υπηρετεί ως Αντιπλοίαρχος στο Πολεμικό Ναυτικό, επικεφαλής στον ΑΣ Δάφνη και Γενικός Γραμματέας της Ελληνικής Ομοσπονδίας Ταεκβοντό.

Κωνσταντίνος Μπέης *(PhD, MSc), ΕΕΠ, ΤΕΦΑΑ-ΑΠΘ)*

Ο Dr. Κωνσταντίνος Μπέης διδάσκει στο Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης τα μαθήματα «Επιλογή Taekwondo» από το 1991, «Ειδικότητα Taekwondo-WTF» από το 1994 και «Ειδικότητα Taekwondo-ITF» από το 2018. Δίδαξε θεωρία και πράξη σε 13 Σχολές Προπονητών Taekwondo της Ελληνικής και της Πανευρωπαϊκής Ομοσπονδίας (1996-2011).Είναι Διδάκτωρ του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης από το 2001. Το 1996 απέκτησε το Μεταπτυχιακό Δίπλωμα Προπονητικής από το Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Δημοκριτείου Πανεπιστημίου Θράκης. Σπούδασε επίσης για 2 χρόνια (1983-84) στο Πανεπιστήμιο Johann Wolfgang Goethe, Sport Institute της Φρανκφούρτης, όπου ειδικεύθηκε στην Αθλητιατρική. Συνέγραψε και επιμελήθηκε την έκδοση τριών βιβλίων για το Taekwondo, συνέγραψε "ΣΗΜΕΙΩΣΕΙΣ" για τους φοιτητές/τριες του Αριστοτελείου Πανεπιστημίου. Συνέγραψε επίσης δεκάδες επιστημονικές εργασίες που παρουσίασε σε Διεθνή Συνέδρια και επιστημονικά περιοδικά και παρακολούθησε περισσότερα από 60 Επιστημονικά Συνέδρια, Συμπόσια και Σεμινάρια (Διεθνή και Ελληνικά). Διετέλεσε Ομοσπονδιακός Προπονητής όλων των Εθνικών ομάδων στην Ελληνική Ομοσπονδία Taekwondo (1991-2000 & 2005-2010) και συμμετείχε ως προπονητής και ως Επιστημονικός Συνεργάτης στην προετοιμασία της Ελληνικής Ολυμπιακής ομάδας στους Ολυμπιακούς Αγώνες: ΒΑΡΚΕΛΩΝΗ 1992, ΣΥΔΝΕΫ 2000, ΠΕΚΙΝΟ 2008. Διετέλεσε πρωταθλητής Ελλάδος στο Taekwondo και αγωνίσθηκε ως μέλος της Εθνικής Ομάδας Ανδρών στο Πανευρωπαϊκό (5η θέση) και στο Παγκόσμιο πρωτάθλημα Taekwondo (1982-1983).

Παναγιώτης Δανιηλίδης *(PhD, MSc), αποσπασμένος Καθηγητής ειδικότητας Ταεκβοντό ΤΕΦΑΑ Σερρών*

Ο Παναγιώτης Δανιηλίδης είναι Καθηγητής Φυσικής Αγωγής με ειδικότητα στο Ταεκβοντο, αποσπασμένος στο ΤΕΦΑΑ Σερρών του ΑΠΘ. Υπήρξε 11 φορές Πρωταθλητής Ελλάδος (3 χρυσά, 4 ασημένια και 4 χάλκινα μετάλλια) και 3ος Μεσογειονίκης το 1991, με σημαντικές διεθνείς διακρίσεις. Από το 1993 δραστηριοποιείται ως προπονητής στον ΑΓΣ Πρωτέα Σερρών και σε Εθνικά Συγκροτήματα, αναδεικνύοντας αθλητές με διεθνείς επιτυχίες. Είναι κάτοχος Μεταπτυχιακού στην Κινησιολογία και Διδακτορικού στην Προπονητική του Ταεκβοντο. Τα ερευνητικά του ενδιαφέροντα επικεντρώνονται στην προπονητική μεθοδολογία, τη βελτιστοποίηση της απόδοσης και την κινησιολογική ανάλυση των μαχητικών αθλημάτων.

Παναγιώτης Ιωαννίδης, *Δάσκαλος 9 Dan Ταεκβοντό*

9 Dan

Εξεταστής DAN
Υπεύθυνος σεμιναρίων POOMSAE
Πρ. Προπονητής εθνικής ομάδας POOMSAE

Πρόγραμμα Μεταπτυχιακών Σπουδών

Φυσιολογία της Άσκησης
& Προπονητική

CONTEMPORARY APPROACHES IN TAEKWONDO: COACHING, PERFORMANCE ANALYSIS, POOMSAE AND MENTORING

Workshop Coordinator:

Christos Ormanlidis, (MSc), DPESS-DUTH

Description:

The seminar "Contemporary Approaches in Taekwondo: Coaching, Performance Analysis, Poomsae and Mentoring" aims to provide a comprehensive overview of the key dimensions of modern Taekwondo, integrating scientific knowledge, coaching practice, and high-level athletic experience. Through a structured and multidimensional approach, participants will explore the principles of modern coaching, gain insight into performance analysis and the demands of contemporary competition, become familiar with the technical aspects and teaching methodology of poomsae. Special emphasis is placed on the role of mentoring and experiential learning in athlete development, highlighting the importance of transferring knowledge and values from elite sport into coaching practice. The seminar combines theoretical background with practical applications, offering a holistic and up-to-date perspective of Taekwondo as both an Olympic sport and an educational tool.

Instructors:

Michalis Mouroutsos, Olympic Gold Medalist in Taekwondo

Michalis Mouroutsos is an Olympic gold medalist from the 2000 Sydney Olympic Games in the 58 kg category. He was European Champion in 2000 in the men's division. He won the silver medal at the 1999 European Championships in the Olympic categories. He won the bronze medal at the 1997 European Junior Championships in Patras. He also won the bronze medal at the World University Games in Izmir in 2005. He won the bronze medal at the World Military Championships in Korea in 2006. He is a two-time Balkan Champion in 1997 and 1998. He achieved fifth place four times at the World Championships in 1997 in Hong Kong, in 2001 in Korea, in 2003 in Garmisch, Germany, and in 2005 in Madrid, Spain. He serves as a Commander in the Hellenic Navy, is head of AS Dafni, and serves as Secretary General of the Hellenic Taekwondo Federation.

Konstantinos Beis (PhD, MSc), Special Teaching Staff, School of Physical Education and Sport Science, Aristotle University of Thessaloniki

Dr. **Konstantinos Beis** teaches at the School of Physical Education and Sport Science of the Aristotle University of Thessaloniki the courses "Taekwondo Elective" since 1991, "Taekwondo Specialization WTF" since 1994, and "Taekwondo Specialization ITF" since 2018. He taught theory and practice in thirteen Taekwondo coaching schools of the Hellenic and European Federation from 1996 to 2011. He has held a PhD from the School of Physical Education and Sport Science of the Aristotle University of Thessaloniki since 2001. In 1996 he

obtained a Master's degree in Coaching from the School of Physical Education and Sport Science of the Democritus University of Thrace. He also studied for two years at the Johann Wolfgang Goethe University Sport Institute in Frankfurt, specializing in Sports Medicine. He has authored and edited three books on Taekwondo and has written lecture notes for the students of the Aristotle University of Thessaloniki. He has also authored dozens of scientific papers presented at international conferences and journals and has attended more than sixty scientific conferences, symposia, and seminars. He served as National Team Coach for all national teams of the Hellenic Taekwondo Federation from 1991 to 2000 and from 2005 to 2010 and participated as a coach and scientific associate in the preparation of the Greek Olympic team for the Olympic Games in Barcelona 1992, Sydney 2000, and Beijing 2008. He was a Greek Taekwondo champion and competed as a member of the men's national team at the European Championships where he achieved fifth place and at the World Championships in 1982 and 1983.

Daniilidis Panagiotis, PhD in Taekwondo Coaching, MSc in Kinesiology

Panagiotis Daniilidis is a Physical Education Professor specializing in Taekwondo, seconded to the Department of Physical Education and Sport Science (DPESS) in Serres at Aristotle University of Thessaloniki. He is an eleven-time Greek Champion (3 gold, 4 silver, and 4 bronze medals) and a bronze medalist at the 1991 Mediterranean Games, with significant international distinctions. Since 1993, he has been coaching at the Proteas Serres Athletic Club and has served as a coach for National Teams, guiding athletes to international success. He holds a Master's degree in Kinesiology and a PhD in Taekwondo Coaching. His research interests focus on training methodology, performance optimization, and the kinesiological analysis of combat sports.

Ioannidis Panagiotis, Grandmaster 9 Dan

Panagiotis Ioannidis is a 9th Dan Taekwondo master, DAN Examiner and POOMSAE Seminar Manager, as well as a former National POOMSAE Team Coach.

With the support of:

Postgraduate Program
Exercise Physiology and Sports Training Science

ΠΟΔΗΛΑΣΙΑ ΕΣΩΤΕΡΙΚΟΥ ΧΩΡΟΥ

Περιγραφή:

Η Ποδηλασία Εσωτερικού Χώρου (Indoor Cycling) αποτελεί μια δομημένη μορφή καρδιοαναπνευστικής άσκησης μέτριας έως υψηλής έντασης, η οποία εκτελείται σε στατικά ποδηλατικά εργόμετρα εντός ειδικά διαμορφωμένου χώρου άσκησης. Τα μαθήματα πραγματοποιούνται με συγχρονισμένη μουσική συνοδεία και καθοδηγούνται από πιστοποιημένο Καθηγητή Φυσικής Αγωγής, διασφαλίζοντας την ορθή τεχνική διδασκαλία, τη ρύθμιση της επιβάρυνσης και την ασφάλεια των συμμετεχόντων.

Αποτελεί μία από τις πλέον διαδεδομένες μορφές ομαδικής άσκησης στα σύγχρονα γυμναστήρια, καθώς προσαρμόζεται σε ευρύ φάσμα πληθυσμιακών ομάδων, συμπεριλαμβανομένων προπονημένων αθλητών, ασκούμενων αναψυχής, προηγουμένως καθιστικών ατόμων και ηλικιωμένων. Η ένταση μπορεί να τροποποιείται συστηματικά σύμφωνα με το επίπεδο φυσικής κατάστασης και τους εκάστοτε προπονητικούς στόχους και να παρακολουθείται μέσω τεχνολογίας.

Το σεμινάριο συνδυάζει θεωρητικό υπόβαθρο και εφαρμοσμένη πρακτική και απευθύνεται σε επαγγελματίες και ειδικούς που επιθυμούν να εμβαθύνουν στην ομαδική καρδιοαναπνευστική προπόνηση, αξιοποιώντας διαλειμματική μεθοδολογία καθοδηγούμενη από τη μουσική σε ποδήλατα εσωτερικού χώρου. Παρέχει βασικές και εφαρμοσμένες γνώσεις σχετικά με τη σωστή βιομηχανική τεχνική, τις αρχές συνταγογράφησης της άσκησης, τη δομή του μαθήματος, την παρακολούθηση της έντασης και τον σχεδιασμό ολοκληρωμένων, ασφαλών και επιστημονικά τεκμηριωμένων προγραμμάτων Indoor Cycling σε περιβάλλον γυμναστηρίου.

Οι συμμετέχοντες θα λάβουν μέρος και σε επιβλεπόμενη πρακτική συνεδρία, βιώνοντας ένα δομημένο πρωτόκολλο υψηλής ενεργειακής απόδοσης, το οποίο αναδεικνύει την εφαρμογή επιστημονικών αρχών σε ένα δυναμικό περιβάλλον ομαδικής άσκησης.

Εισηγητής:

Κωνσταντίνος Δεληγεώργης

Αθλητής ορεινής ποδηλασίας και ποδηλασίας δρόμου από νεαρή ηλικία, καθώς και διεθνής νικητής υπερμαραθωνίων αποστάσεων στο εξωτερικό. Είναι επαγγελματίας Spinning® Instructor (Johnny G., Mad Dogg Athletics) στην Ευρώπη και τα ΗΑΕ, με πολλές εξειδικεύσεις, συμπεριλαμβανομένης της προπόνησης παιδιών, εγκύων, αθλητών και ειδικών πληθυσμιακών ομάδων. Έχει ολοκληρώσει πολλούς 6ωρους και 12ωρους μαραθώνιους ενώ είναι ο μοναδικός Έλληνας που έχει ολοκληρώσει έναν επίσημο 24ωρο μαραθώνιο Spinning®. Επιπλέον πιστοποιήσεις: Personal Trainer, Elite Exercise Specialist, Sport Performance School, SUSPENSION TRAINING COURSE, Sport Integrity Australia και ASADA Anti-Doping Level 2 Anti-Doping Course & Clean Sport 101. Συμμετείχε ως αθλητικός συνεργάτης στη επιστημονική μελέτη του 2008 με τίτλο: "Contribution of Respiratory Muscle Blood Flow to Exercise-induced

Diaphragmatic Fatigue in Trained Cyclists.", 2008. Έχει παρακολουθήσει συνέδρια Καρδιολογίας, Σακχαρώδη Διαβήτη, Ορθοπεδικής. Από το 2012 διοργανώνει ποδηλατικούς υπερμαραθώνιους σε Ελλάδα και Κύπρο.

INDOOR CYCLING

Description:

Indoor Cycling is a structured form of moderate- to high-intensity cardiorespiratory exercise performed on stationary cycling ergometers within a purpose-designed studio environment. Sessions are conducted with synchronized musical accompaniment and are led by a certified Physical Education professional, ensuring appropriate technical instruction, workload regulation, and participant safety. It constitutes one of the most widely implemented group exercise modalities in contemporary fitness facilities, as it is adaptable to a broad spectrum of populations, including trained athletes, recreationally active individuals, previously sedentary participants, and older adults. Intensity can be systematically modified according to individual fitness levels and training objectives and monitored through technology. The seminar integrates theoretical framework with applied practice and is intended for professionals and practitioners seeking to deepen their understanding of group-based cardiorespiratory training utilizing music-driven interval methodology on indoor cycling ergometers. It provides foundational and applied knowledge regarding proper biomechanical technique, exercise prescription principles, session structure, intensity monitoring, and the development of comprehensive, safe, and evidence-informed indoor cycling programs within a fitness setting. Participants will also engage in a supervised practical session, experiencing a structured, high-energy training protocol that demonstrates the application of scientific principles in a dynamic group exercise environment.

Workshop Instructor:

Konstantinos Deligeorgis, *Certified Spinning® Instructor (MDA)*

Mountain biking and road cycling athlete from a young age, and an international ultramarathon distance winner abroad. He is a professional **Spinning® Instructor** (Johnny G., Mad Dogg Athletics) in Europe and the UAE, holding multiple specializations, including training for children, pregnant women, athletes, and special populations. He has completed multiple 6-hour and 12-hour events and he is the only Greek Spinning Instructor to have completed an official 24-hour Spinning® marathon event. Additional certifications include: Personal Trainer; Elite Exercise Specialist; Sport Performance School; SUSPENSION TRAINING COURSE; Sport Integrity Australia; and ASADA Anti-Doping Level 2 Anti-Doping Course & Clean Sport 101. He participated as an athletic collaborator in the 2008 scientific study titled: “Contribution of Respiratory Muscle Blood Flow to Exercise-induced Diaphragmatic Fatigue in Trained cyclists.”, 2008. He has attended medical and scientific conferences in Cardiology, Diabetes Mellitus, and Orthopedics. Since 2012, he has been organizing cycling ultramarathon events in Greece and Cyprus.

Η ΕΠΙΔΡΑΣΗ ΤΗΣ ΔΙΕΚΔΙΚΗΤΙΚΟΤΗΤΑΣ ΣΤΗΝ ΕΠΙΤΕΥΞΗ ΠΡΟΣΩΠΙΚΩΝ, ΑΚΑΔΗΜΑΪΚΩΝ ΚΑΙ ΕΠΑΓΓΕΛΜΑΤΙΚΩΝ ΣΤΟΧΩΝ

Υπεύθυνη Σεμιναρίου:

Στέλλα Γεωργιάδου, *Διοικητική Υπάλληλος ΔΠΘ, Σύμβουλος Σταδιοδρομίας και Επαγγελματικού Προσανατολισμού*

Περιγραφή:

Η Διεκδικητικότητα αποτελεί μία από τις βασικές δεξιότητες για τη διαχείριση τόσο της προσωπικής ζωής όσο και της επαγγελματικής σταδιοδρομίας. Αναφέρεται στην ικανότητα του ατόμου να εκφράζει με σαφήνεια και ειλικρίνεια τις ανάγκες και τις απόψεις του, ενώ ταυτόχρονα να θέτει όρια με σεβασμό προς τους άλλους, αποφεύγοντας τόσο την παθητικότητα όσο και την επιθετικότητα. Στόχος του συγκεκριμένου σεμιναρίου είναι να παρουσιάσει την έννοια της διεκδικητικής συμπεριφοράς και να βοηθήσει τους συμμετέχοντες να αναγνωρίσουν τους παράγοντες που τους εμποδίζουν να την εφαρμόζουν στην καθημερινότητά τους. Επιπλέον, θα εξεταστούν οι πιθανές επιπτώσεις της έλλειψης διεκδικητικότητας, τόσο σε προσωπικό όσο και σε επαγγελματικό επίπεδο. Μέσα από συζήτηση και αναφορά πρακτικών παραδειγμάτων, οι συμμετέχοντες θα κατανοήσουν τη σημασία της καλλιέργειας της διεκδικητικής συμπεριφοράς, ώστε να μπορούν να επικοινωνούν με αυτοπεποίθηση, να θέτουν υγιή όρια και να διαχειρίζονται αποτελεσματικά συγκρούσεις στην προσωπική και επαγγελματική τους ζωή.

Εισηγήτρια:

Στέλλα Γεωργιάδου, *Διοικητική Υπάλληλος ΔΠΘ, Σύμβουλος Σταδιοδρομίας και Επαγγελματικού Προσανατολισμού*

*Η **Στέλλα Γεωργιάδου** είναι απόφοιτη του Τμήματος Ψυχολογίας ΑΠΘ, κάτοχος μεταπτυχιακών διπλωμάτων "Σπουδές στην Εκπαίδευση" του ΕΑΠ και "Επαγγελματικός Προσανατολισμός και Συμβουλευτική" του Ευρωπαϊκού Πανεπιστημίου της Κύπρου. Πιστοποιημένη από τον ΕΟΠΠΕΠ Σύμβουλος Σταδιοδρομίας και Επαγγελματικού Προσανατολισμού. Εργάστηκα 18 έτη ως Εργασιακός Σύμβουλος στον ΟΑΕΔ και τώρα είμαι τοποθετημένη στο Γραφείο Επαγγελματικής Συμβουλευτικής και Ανάπτυξης Δεξιοτήτων του ΔΠΘ.*

THE EFFECT OF ASSERTIVENESS ON ACHIEVING PERSONAL, ACADEMIC, AND PROFESSIONAL GOALS

Workshop Director:

Stella Georgiadou, *Administrative Staff Member at Democritus University of Thrace (DUTH), Career and Vocational Guidance Counselor*

Description:

Assertiveness is one of the key skills for managing both personal life and professional development. It refers to an individual's ability to express their needs and opinions clearly and honestly while setting boundaries with respect for others, avoiding both passivity and aggression. The goal of this seminar is to introduce the concept of assertive behavior and help participants identify the factors that prevent them from applying it in their daily lives. Additionally, the seminar will explore the potential consequences of lacking assertiveness, both personally and professionally. Through discussion and practical examples, participants will understand the importance of cultivating assertive behavior so that they can communicate with confidence, establish healthy boundaries, and manage conflicts effectively in both their personal and professional lives.

Instructor:

Stella Georgiadou, *Administrative Staff Member at Democritus University of Thrace (DUTH), Career and Vocational Guidance Counselor*

Stella Georgiadou is a graduate of the Department of Psychology, Aristotle University of Thessaloniki (AUTH), holder of postgraduate degrees in “Studies in Education” from the Hellenic Open University (HOU) and “Career Guidance and Counseling” from the European University Cyprus. Certified Career Guidance and Vocational Counseling Advisor by EOPPEP (National Organization for the Certification of Qualifications and Vocational Guidance). I worked for 18 years as an Employment Counselor at OAED (Public Employment Service), and I am currently appointed at the Office of Career Counseling and Skills Development of Democritus University of Thrace (DUTH).

ΕΙΣΑΓΩΓΗ ΣΤΟ ΤΣΙΡΛΙΝΤΙΝΓΚ: ΜΙΑ ΣΥΜΠΕΡΙΛΗΠΤΙΚΗ ΜΟΡΦΗ ΑΣΚΗΣΗΣ

Υπεύθυνη Σεμιναρίου:

Ουρανία Ματσούκα, *Καθηγήτρια Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού (ΤΕΦΑΑ), Σχολή Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Περιγραφή:

Το σεμινάριο παρουσιάζει το τσιρλίντινγκ ως σύγχρονο, πολυδιάστατο και συμπεριληπτικό άθλημα, με έμφαση στην προσαρμοστικότητα ανάλογα με σωματότυπο και ικανότητες, προωθώντας τη μακροχρόνια συμμετοχή στην άσκηση.

Κύρια σημεία του σεμιναρίου:

Θεωρητικό μέρος:

- Ιστορική πορεία και θεσμικό πλαίσιο του τσιρλίντινγκ
- Κανονισμοί της International Cheer Union (ICU)
- Κινησιολογικά-βιομηχανικά χαρακτηριστικά
- Μέθοδοι σταδιακής διδασκαλίας, δομή προπονήσεων και μέτρα ασφαλείας

Πρακτικό μέρος:

- Βιωματική γνωριμία με τις κατηγορίες Performance Cheer (pom, jazz, hip hop, high kicks) και Cheerleading (stunts, pyramids)
- Προσαρμογή ασκήσεων σε ηλικία και κινητική ικανότητα
- Έμφαση στη συμπερίληψη, ασφάλεια και θετική εμπειρία στην άσκηση
- Ανάπτυξη δεξιοτήτων συντονισμού, ισορροπίας, ευλυγισίας και συνεργασίας μέσω πρακτικών δραστηριοτήτων και σύντομων χορογραφιών
- Απαιτούνται αθλητικά ρούχα και παπούτσια για τη συμμετοχή στο σεμινάριο.

Στόχος είναι οι συμμετέχοντες να αποκτήσουν εργαλεία για να εφαρμόσουν ή να διδάξουν τσιρλίντινγκ με δημιουργικό, ενθαρρυντικό και συμπεριληπτικό τρόπο, ενισχύοντας ενεργό συμμετοχή και αυτοπεποίθηση. Το πρόγραμμα ευελπιστεί να πυροδοτήσει έρευνα και εκπαιδευτική εφαρμογή του Τσιρλίντινγκ στην Ελλάδα και διεθνώς.

Εισηγήτρια:

Κωνσταντίνα Μάρκου, *Καθηγήτρια Φυσικής Αγωγής (MSc στον Αθλητικό Τουρισμό, Οργάνωση Δρώμενων και Χορό), Εξειδικευμένη Προπονήτρια Τσιρλίντινγκ και Καλλιτεχνικής Κολύμβησης*

*Η **Κωνσταντίνα Μάρκου** είναι απόφοιτη του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού (ΤΕΦΑΑ) Αθηνών, με εξειδίκευση στον παραδοσιακό χορό και την καλλιτεχνική κολύμβηση. Εξειδικευμένη προπονήτρια τσιρλίντινγκ, με εμπειρία στη σχεδίαση και υλοποίηση προγραμμάτων άσκησης για όλες τις ηλικίες.*

INTRODUCTION TO CHEERLEADING: AN INCLUSIVE FORM OF EXERCISE

Seminar Director:

Ourania Matsouka, *Professor at the Department of Physical Education and Sport Science (DPESS), School of Physical Education, Sport Science and Occupational Therapy (SEFAAE), Democritus University of Thrace (DUTH)*

Description:

This workshop presents cheerleading as a contemporary, multidimensional, and inclusive sport, emphasizing adaptability to different body types and abilities, promoting long-term engagement in physical activity.

Key points of the workshop:

Theoretical component:

- History and regulatory framework of cheerleading
- Rules of the International Cheer Union (ICU)
- Kinesiological and biomechanical characteristics
- Progressive teaching methods, training structure, and safety measures

Practical component:

- Experiential learning of Performance Cheer (pom, jazz, hip hop, high kicks) and Cheerleading (stunts, pyramids)
- Exercise adaptation according to age and motor skills
- Emphasis on inclusion, safety, and positive exercise experience
- Development of coordination, balance, flexibility, and teamwork through practical activities and short choreographies
- Athletic clothing and shoes are required to participate in the workshop.

Objective: Participants will acquire tools to apply or teach cheerleading in a creative, encouraging, and inclusive way, enhancing active participation and self-confidence. The program aims to stimulate research and educational application of cheerleading in Greece and internationally.

Instructor:

Konstantina Markou, Physical Education Teacher (MSc in Sport Tourism, Event Organization and Dance), Specialized Cheerleading and Artistic Swimming Coach

Konstantina Markou ia a graduate of the Department of Physical Education and Sport Science (TEFAA), University of Athens, with a specialization in traditional dance and artistic swimming. Certified cheerleading coach with experience in designing and implementing exercise programs for all ages.

AQUA CREATIVITY PLAY – ΔΗΜΙΟΥΡΓΙΚΗ ΠΡΟΣΕΓΓΙΣΗ ΣΤΗΝ ΚΟΛΥΜΒΗΣΗ ΠΡΟΣΧΟΛΙΚΗΣ ΗΛΙΚΙΑΣ

Υπεύθυνος Σεμιναρίου:

Βασίλειος Γούργουλης, *Ph.D., Αντιπρύτανης Διοικητικών Υποθέσεων Δ.Π.Θ., Καθηγητής Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού (Τ.Ε.Φ.Α.Α.) της Σχολής Επιστήμης Φυσικής Αγωγής, Αθλητισμού και Εργοθεραπείας (Σ.Ε.Φ.Α.Α.Ε.) του Δημοκρίτειου Πανεπιστημίου Θράκης (Δ.Π.Θ.)*

Περιγραφή:

Πώς μπορεί το μάθημα κολύμβησης για παιδιά προσχολικής ηλικίας να μετατραπεί σε μια εμπειρία δημιουργίας, παιχνιδιού και εξερεύνησης;

Το σεμινάριο Aqua Creativity Play παρουσιάζει μια καινοτόμο παιδαγωγική προσέγγιση για την κολύμβηση παιδιών 3–5 ετών, που βρίσκονται στο μεταβατικό στάδιο από το baby swimming στη συμμετοχή σε οργανωμένα μαθήματα στην πισίνα. Το πρόγραμμα συνδυάζει τη φυσική αγωγή, την κινητική δημιουργικότητα και το παιχνίδι στο νερό, δημιουργώντας ένα περιβάλλον μάθησης που ενισχύει την αυτοπεποίθηση, τη φαντασία και την κινητική ανάπτυξη των παιδιών. Το σεμινάριο απευθύνεται σε φοιτητές και πτυχιούχους Φυσικής Αγωγής, προπονητές κολύμβησης, εκπαιδευτές baby και toddler swimming, καθώς και σε επαγγελματίες που εργάζονται με παιδιά σε υδάτινα περιβάλλοντα, όπως σε κολυμβητήρια, αθλητικούς συλλόγους, καλοκαιρινά camps και ξενοδοχειακές μονάδες. Στο πλαίσιο του σεμιναρίου θα παρουσιαστούν πρακτικές ιδέες και βιωματικές δραστηριότητες για τη δημιουργία δημιουργικών μαθημάτων toddler swimming, που ενθαρρύνουν τα παιδιά να εξερευνούν το νερό με ασφάλεια, χαρά και δημιουργική έκφραση.
Οι συμμετέχοντες θα γνωρίσουν ένα ολοκληρωμένο μοντέλο σχεδιασμού μαθήματος, βασισμένο στις αρχές της κινητικής δημιουργικότητας, της παιδοκεντρικής εκπαίδευσης και της βιωματικής μάθησης, το οποίο μπορεί να εφαρμοστεί άμεσα στη διδασκαλία της κολύμβησης προσχολικής ηλικίας. Το σεμινάριο φιλοδοξεί να αποτελέσει πηγή έμπνευσης για σύγχρονες και δημιουργικές πρακτικές διδασκαλίας στο υδάτινο περιβάλλον, αναδεικνύοντας το νερό ως χώρο μάθησης, παιχνιδιού και δημιουργικότητας.

Εισηγήτρια:

Αικατερίνη Δημακοπούλου, *Καθηγήτρια Φυσικής Αγωγής, Υποψήφια Διδάκτωρ Τμήματος Οργάνωσης & Διαχείρισης Αθλητισμού, Σχολής Επιστημών Ανθρώπινης Κίνησης και Ποιότητας Ζωής Πανεπιστημίου Πελοποννήσου, MSc Παιδαγωγική & Δημιουργική Μάθηση, MSc Μεγιστοποίηση Απόδοσης & Επίδοσης στην κολύμβηση, Mermaiding Master Trainer*

AQUA CREATIVITY PLAY – A CREATIVE APPROACH TO PRESCHOOL SWIMMING

Seminar Director:

Vassilios Gourgoulis, *Ph.D. , Vice Rector for Administrative Affairs, Democritus University of Thrace, Professor, Department of Physical Education and Sport Science (DPESS), School of Physical Education, Sport Science and Occupational Therapy, Democritus University of Thrace (DUTH)*

Description:

How can a swimming lesson for preschool children be transformed into an experience of creativity, play, and exploration? The Aqua Creativity Play seminar presents an innovative pedagogical approach to swimming for children aged 3–5, who are at the transitional stage from baby swimming to participation in structured swimming lessons in the pool. The program combines physical education, motor creativity, and play in the aquatic environment, creating a learning setting that enhances children's self-confidence, imagination, and motor development.
The seminar is addressed to students and graduates of Physical Education, swimming coaches, baby and toddler swimming instructors, as well as professionals who work with children in aquatic environments, such as swimming pools, sports clubs, summer camps, and hotel facilities. During the seminar, practical ideas and experiential activities for designing creative toddler swimming lessons will be presented, encouraging children to explore the water with safety, joy, and creative expression. Participants will become familiar with a comprehensive lesson planning model based on the principles of motor creativity, child-centered education, and experiential learning, which can be directly applied to the teaching of preschool swimming. The seminar aims to serve as a source of inspiration for modern and creative teaching practices in aquatic environments, highlighting water as a space for learning, play, and creativity.

Instructor:

Aikaterini Dimakopoulou, *P.E. Teacher, Doctoral Candidate, Department of Sports Organization and Management, School of Human Movement and Quality of Life Sciences, University of the Peloponnese, MSc Pedagogy & Creative Learning, MSc Maximizing Performance in Swimming, Mermaiding Master Trainer*

ΔΙΔΑΣΚΑΛΙΑ ΚΑΙ ΕΞΑΣΚΗΣΗ ΚΙΝΗΤΙΚΩΝ ΔΕΞΙΟΤΗΤΩΝ ΜΕΣΩ ΠΑΡΑΔΟΣΙΑΚΩΝ ΠΑΙΧΝΙΔΙΩΝ, ΚΥΠΡΟΥ ΚΑΙ ΠΟΝΤΟΥ

Υπεύθυνος Σεμιναρίου:

Αλμπανίδης Ευάγγελος, *Καθηγητής, Τμήμα Επιστήμης Φυσικής Αγωγής και Αθλητισμού, Δημοκρίτειο Πανεπιστήμιο Θράκης ΤΕΦΑΑ – ΔΠΘ, Κοσμήτορας ΣΕΦΑΑ - ΔΠΘ*

Περιγραφή:

Το σεμινάριο στοχεύει στο να προσφέρει γνώσεις μέσω βιωματικής εμπειρίας για την παιδαγωγική αξία κινητικών παραδοσιακών παιχνιδιών, Κύπρου και Πόντου. Μετά από έρευνα πεδίου με καταγραφές παραδοσιακών παιχνιδιών και βιβλιογραφική έρευνα 1874-2025, συγκεντρώσαμε γύρω στα 500 παραδοσιακά παιχνίδια της Κύπρου και περίπου 300 παιχνίδια Πόντου. Θα μπορούσαμε να εντάξουμε τα παιχνίδια αυτά στις εξής κατηγορίες παιχνιδιών: θεατρικά, κινητικά, μουσικοκινητικά, επιτραπέζια, συμποσιακά και παιχνίδια αντικείμενα. Στο συγκεκριμένο σεμινάριο θα ασχοληθούμε αποκλειστικά με την κατηγορία των κινητικών παιχνιδιών.

Θα ασχοληθούμε με αντιπροσωπευτικά κινητικά παιχνίδια της Κύπρου και του Πόντου και την αξιοποίησή τους για τη διδασκαλία και εξάσκηση κινητικών δεξιοτήτων. Παράλληλα θα δούμε και την αξιοποίηση ενδεικτικών παιχνιδιών για την ανάπτυξη κοινωνικών δεξιοτήτων και αρετών. Προτεινόμενη κατηγοριοποίηση των κινητικών παραδοσιακών παιχνιδιών κατά «ηλικία» είναι:

1. Με δεξιότητες χειρισμού
2. Με δεξιότητες σταθεροποίησης
3. Με δεξιότητες μετακίνησης
4. Με συνδυασμούς δεξιοτήτων
5. Χορευτικά.

Θεμελιώδεις αρχές που διέπουν την όλη προσπάθεια είναι:

1. Η υποστήριξη εκπαιδευτικών και εκπαιδευτών στην προσπάθειά τους να βελτιώσουν κινητικές δεξιότητες και κοινωνικές αρετές αξιοποιώντας κινητικά λαϊκά παιχνίδια σε σχολεία, κατασκηνώσεις, ενορίες και άλλα οργανωμένα σύνολα.
2. Η συνύπαρξη, επικοινωνία, αλληλοϋποστήριξη διαφορετικών γενεών.
3. Η ισότιμη συμμετοχή όλων, ανεξαρτήτως ηλικίας, κινητικών ή/και γνωστικών δεξιοτήτων και συναισθηματικής κατάστασης. Είναι σημαντικό να επισημανθεί ότι οι εκπαιδευτικοί ενθαρρύνονται να προβαίνουν σε μερικές τροποποιήσεις των παραδοσιακών παιχνιδιών με βάση τα χαρακτηριστικά των συμμετεχόντων (ηλικία, άτομα με κινητικές δυσκολίες).

Εισηγητές:

Βασίλης Ασβεστάς

Ο Βασίλης Ασβεστάς είναι απόφοιτος του Α.Τ.Ε.Ι. Θεσσαλονίκης, της Σχολής Επαγγελμάτων Υγείας, Τμήμα Φυσικοθεραπείας και εργάζεται ως παιδιατρικός φυσικοθεραπευτής. Η γνωριμία του με τη λαϊκή παράδοση ξεκίνησε από τη νηπιακή ηλικία, καθώς η βιωματική επαφή με τους πρόσφυγες παππούδες του, αλλά και το ευρύτερο οικογενειακό περιβάλλον, αποτέλεσαν την αφορμή για την ενασχόληση του με την παράδοση. Από νεαρή ηλικία πραγματοποιεί πρωτογενή έρευνα για τα έθιμα, τα παιχνίδια, τους χορούς και τις μουσικές των Ελλήνων της Ανατολής. Αρθρογραφεί επί σειρά ετών σε λαογραφικά περιοδικά για θέματα σχετικά με τον λαϊκό χορό ("Αρχείον Πόντου", "Ποντιακή Εστία", "Αργοναύτης" κ.ά.), ενώ το 2021 εξέδωσε το πρώτο του βιβλίο με τίτλο, «Τα παιχνίδια του Ανατολικού Πόντου και του Κυβερνείου του Καρς από το 1880 έως το 1930». Βρίσκεται υπό έκδοση το νέο του βιβλίο με τίτλο, «Η εξέλιξη της μουσικοχορευτικής παράδοσης των Ποντίων του Ακ Ταγ Ματέν».

Σπύρος Αυγουστής

Ο Σπύρος Αυγουστής κατάγεται από τη Χίο. Αρχικά σπούδασε τεχνολόγος μηχανολόγος μηχανικός αλλά τον κέρδισε η πρωτοβάθμια εκπαίδευση (απόφοιτος της Μαρασλείου Παιδαγωγικής Ακαδημίας). Υπηρέτησε ως Δάσκαλος από το 1986 μέχρι και το 2018 σε δημόσια σχολεία της Αθήνας. Σε συνεργασία με τους Συλλόγους Γονέων υλοποίησε πληθώρα εκπαιδευτικών-πολιτιστικών εκδηλώσεων με κεντρικό άξονα τη διαγενεακή μάθηση-ψυχαγωγία. Τα τελευταία χρόνια είναι σύμβουλος εκπαιδευτικών προγραμμάτων της Ελληνικής Ολυμπιακής Ακαδημίας. Με Ολυμπιονίκες και διακεκριμένους αθλητές και αθλήτριες-συνεργάτες της ΕΘΝΟΑ-ταξιδεύει σε όλη την Ελλάδα υλοποιώντας αθλητικές δράσεις αλλά και βιωματικά προγράμματα-εργαστήρια που έχουν στόχο της διάδοση της Ολυμπιακής Παιδείας.

Λούκας Κωνσταντίνου

Ο Λούκας Κωνσταντίνου γεννήθηκε στο χωριό Νέα Σπάρτη Αμμοχώστου. Είναι εκπαιδευτικός από το 1992, αρχικά στην Πρωτοβάθμια και τα τελευταία οκτώ χρόνια στη Δευτεροβάθμια Εκπαίδευση της Κύπρου. Είναι απόφοιτος του ΤΕΦΑΑ Θεσσαλονίκης, της Παιδαγωγικής Ακαδημίας Κύπρου, του Διδασκαλείου του ΑΠΘ και του προγράμματος Μεταπτυχιακών Σπουδών (Δ.Μ.Σ.) στη «Δημιουργική και Προσαρμοσμένη Φυσική Αγωγή»του ΤΕΦΑΑ Κομοτηνής. Τα ερευνητικά του ενδιαφέροντα σχετίζονται με τα λαϊκά παιχνίδια, την ιστορία Φυσικής Αγωγής, την αθλητική παιδική λογοτεχνία και τη διδακτική της Φυσικής Αγωγής. Έχει γράψει βιβλία που σχετίζονται με την Ιστορία της Φυσικής Αγωγής. Πρόσφατα εξέδωσε βιβλίο με τίτλο: Παραδοσιακά Κινητικά Παιχνίδια της Κύπρου.

TEACHING AND PRACTICE OF FUNDAMENTAL MOTOR SKILLS THROUGH TRADITIONAL GAMES OF CYPRUS AND PONTUS

Workshop Coordinator:

Evangelos Albanidis, *Professor DPESS-DUTH, Dean of SPESS-DUTH*

Description:

The seminar aims to provide knowledge through experiential learning regarding the pedagogical value of traditional motor games from Cyprus and Pontus. Approximately 500 traditional games from Cyprus and 300 games from Pontus were collected through field research involving the recording of traditional games and literature review covering the period 1874–2025. These games can be categorized as follows: theatrical, motor, music-motor, board games, social/feasting games, and object-based games. This seminar will focus exclusively on the category of motor games.

We will explore representative motor games from Cyprus and Pontus and their exploitation in teaching and practicing motor skills. At the same time, we will examine how selected games can contribute to the development of social skills and virtues. A proposed categorization of traditional motor games is:

1. Manipulative skills
2. Balance skills
3. Locomotor skills
4. Combined skills
5. Dance-based games

The fundamental principles guiding this effort are:

1. Supporting educators and trainers in their efforts to improve motor skills and social virtues by utilizing traditional motor games in schools, camps, parishes, and other organized groups.
2. Promoting coexistence, communication, and mutual support among different generations.
3. Ensuring equal participation for all, regardless of age, motor and/or cognitive abilities, or emotional condition. It is important to emphasize that educators are encouraged to make adaptations to traditional games based on participants' characteristics (e.g., age, individuals with motor difficulties).

Instructors:

Vasilis Asvestas

Asvestas Vasilis born in 1971 in Nuremberg, Germany, is a graduate of the Technologigal Educational Institute of Thessaloniki Department of Physiotherapy.Raised in a family with deep Asia Minor roots, he spent decades researching and promoting the folk traditions dances and music of the Greeks of the East. Especially the Pontic people. He has published articles, lectured internationally, and in 2021 released his first book, The Games of the Greeks of the Eastern Sea and the Kars Gonemorate (1880-1923). Vasilis organizes an annual dance seminar in Veria and is the administrator of the folklore Society "Ilioidia". A member of the first committee for Pontian dances with the Pan-Pontian Federation of Greece, he has taught traditional dance for over 35 years and appeared on several TV programs focused on Greek culture.

Spyros Augoustis

Spyros Augoustis originates from Chios. He initially studied as a mechanical engineering technologist but was ultimately drawn to primary education (graduate of the Marasleio Pedagogical Academy). He served as a primary school teacher from 1986 to 2018 in public schools in Athens. In collaboration with Parents' Associations, he implemented numerous educational and cultural events focusing on intergenerational learning and recreation. In recent years, he has been an advisor for educational programs at the Hellenic Olympic Academy. Together with Olympic medalists and distinguished athletes—collaborators of the Hellenic Olympic Academy—he travels throughout Greece implementing sports activities and experiential workshops aimed at promoting Olympic Education.

Lucas Constandinou

Lucas Constandinou was born in the village of Nea Sparta in Famagusta. He has been an educator since 1992, initially in Primary Education and for the past eight years in Secondary Education in Cyprus. He is a graduate of the Department of Physical Education and Sport Science (Thessaloniki), the Pedagogical Academy of Cyprus, the Didaskaleio of Aristotle University of Thessaloniki, and holds a Master's degree in "Creative and Adapted Physical Education" from the Department of Physical Education and Sport Science in Komotini. His research interests include traditional games, the history of Physical Education, sports children's literature, and the teaching of Physical Education. He has authored books related to the history of Physical Education and recently published a book titled "Traditional Motor Games of Cyprus."

Η ΑΣΚΗΣΗ ΕΙΝΑΙ ΦΑΡΜΑΚΟ. ΟΔΗΓΙΕΣ, ΚΑΤΕΥΘΥΝΣΕΙΣ ΚΑΙ ΣΤΡΑΤΗΓΙΚΕΣ ΨΥΧΟΛΟΓΙΚΗΣ ΥΠΟΣΤΗΡΙΞΗΣ ΣΤΗΝ ΑΣΚΗΣΗ ΚΛΙΝΙΚΩΝ ΠΛΗΘΥΣΜΩΝ.

Υπεύθυνος Σεμιναρίου:

Ιωάννης Θεοδωράκης

Περίληψη:

Μεγάλης κλίμακας τεκμηριωμένες έρευνες αποδεκτές από την Παγκόσμια Οργάνωση Υγείας (2024) δείχνουν ότι τα άτομα με ανεπαρκή σωματική δραστηριότητα παρουσιάζουν αυξημένο κίνδυνο πρόωρου θανάτου κατά 20%–30% σε σύγκριση με όσα ασκούνται επαρκώς. Παράλληλα, η τακτική άσκηση μειώνει τον κίνδυνο εμφάνισης πολλών μορφών καρκίνου κατά 8%–28%, καρδιαγγειακών νοσημάτων και εγκεφαλικού επεισοδίου κατά 19%, διαβήτη κατά 17% και κατάθλιψης και άνοιας κατά 28%–32%. Σε επίπεδο δαπανών υγείας, η διαχείριση της άνοιας αντιστοιχεί στο 22% του συνολικού κόστους, ο καρκίνος στο 15% και ο διαβήτης στο 9%, σύμφωνα με τους Santos κ.ά. (2023). Το πρώτο μέρος του σεμιναρίου εστιάζει στην άσκηση ατόμων με άνοια και νόσο Alzheimer, στο πλαίσιο συγκεκριμένου Ευρωπαϊκού προγράμματος Erasmus+, με στόχο τη διατήρηση ή βελτίωση της γνωστικής, συμπεριφορικής και σωματικής λειτουργικότητας και τη βελτίωση της ποιότητας ζωής μέσω τεκμηριωμένων κατευθυντήριων οδηγιών. Το δεύτερο μέρος εστιάζει σε εξειδικευμένες οδηγίες άσκησης και ψυχολογικής υποστήριξης για ευρύ φάσμα κλινικών πληθυσμών, όπως άτομα με κατάθλιψη, καρκίνο, καρδιοπάθειες, διαβήτη, σχιζοφρένεια, πνευμονοπάθειες και διαταραχές χρήσης ουσιών. Ιδιαίτερη έμφαση δίνεται στην εξατομίκευση των προγραμμάτων, στην ενίσχυση της παρακίνησης, στη ρεαλιστική στοχοθεσία, στην οικογενειακή υποστήριξη και στην ενσωμάτωση ψυχολογικών τεχνικών, με το περπάτημα να αναδεικνύεται ως μία από τις πιο ασφαλείς και λειτουργικές μορφές άσκησης μέσα από μεγάλης έκτασης μελέτες, αναλύσεις και οδηγίες.

Βιβλιογραφία

Erasmus + (2026). Promoting the Effects of Physical Exercise (PE) on Cognitive, Behavioral, Physical, and Functional Symptoms of Individuals Diagnosed with Mild Cognitive Impairment (MCI), Alzheimer's Disease (AD), or Other Dementias.
Θεοδωράκης, Γ. (2025). Άσκηση, ψυχική υγεία και ποιότητα ζωής. Κατά της υποκινητικότητας (3η έκδοση). Θεσσαλονίκη. Εκδ. Κυριακίδη.

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Εισηγητές:

Θεοδωράκης Γιάννης, Πανεπιστήμιο Θεσσαλίας

Μπεμπέτσος Ευάγγελος, Δημοκρίτειο Πανεπιστήμιο Θράκης

Ο Γιάννης Θεοδωράκης είναι καθηγητής Αθλητικής Ψυχολογίας του Πανεπιστημίου Θεσσαλίας. Έχει δημοσιεύσει 43 βιβλία και κεφάλαια σε βιβλία σχετικά με τη φυσική αγωγή, τα σπορ και την ψυχολογία της άσκησης και του αθλητισμού, και περισσότερα από 270 άρθρα σε διεθνή και ελληνικά περιοδικά. Έχει γράψει μαζί με τους συνεργάτες του βιβλία σχετικά με τη φυσική αγωγή και την αθλητική ψυχολογία (Άσκηση, Ψυχική Υγεία και Ποιότητα Ζωής, Ψυχολογική Υπεροχή στον Αθλητισμό, Για μια καλύτερη Φυσική Αγωγή, Οργάνωση προγραμμάτων Αγωγής Υγείας, Φυσική Αγωγή για το Γυμνάσιο, κλπ). Ειδικότερα ασχολείται με θέματα ψυχολογίας της άσκησης και υγείας, της ψυχολογίας της απόδοσης στα σπορ, προγραμμάτων αγωγής υγείας, προγραμμάτων ψυχολογικής υποστήριξης αθλητών, άσκησης ατόμων με άνοια μέσω εικονικής πραγματικότητας, επανένταξης στην κοινωνία ατόμων σε προγράμματα απεξάρτησης και προαγωγής της ισότητας στην κοινωνία μέσα από τα σπορ.

EXERCISE AS MEDICINE: GUIDELINES, DIRECTIONS, AND STRATEGIES FOR PSYCHOLOGICAL SUPPORT IN THE EXERCISE OF CLINICAL POPULATIONS

Workshop Director:

Yiannis Theodorakis, *University of Thessaly*

Evangelos Bebetsos, *Democritus University of Thrace*

Description:

Large-scale, evidence-based studies endorsed by the World Health Organization (2024) indicate that individuals with insufficient physical activity face a 20%–30% increased risk of premature mortality compared to those who engage in adequate levels of exercise. Moreover, regular physical activity reduces the risk of several forms of cancer by 8%–28%, cardiovascular disease and stroke by 19%, diabetes by 17%, and depression and dementia by 28%–32%. In terms of healthcare expenditure, dementia accounts for 22% of total costs, cancer for 15%, and diabetes for 9%, according to Santos et al. (2023). The first part of the seminar focuses on exercise interventions for individuals with dementia and Alzheimer's disease, within the framework of a specific European Erasmus+ program. The primary objective is to maintain or improve cognitive, behavioral, and physical functioning, as well as to enhance quality of life, through the implementation of evidence-based guidelines. The second part addresses specialized exercise guidelines and psychological support strategies for a broad range of clinical populations, including individuals with depression, cancer, cardiovascular diseases, diabetes, schizophrenia, pulmonary diseases, and substance use disorders. Particular emphasis is placed on the individualization of exercise programs, the enhancement of motivation, realistic goal-setting, family support, and the integration of psychological techniques. Walking is highlighted, based on extensive studies, analyses, and clinical guidelines, as one of the safest and most functional forms of exercise.

Erasmus + (2026). Promoting the Effects of Physical Exercise (PE) on Cognitive, Behavioral, Physical, and Functional Symptoms of Individuals Diagnosed with Mild Cognitive Impairment (MCI), Alzheimer's Disease (AD), or Other Dementias.

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Speakers:

Yiannis Theodorakis, *University of Thessaly*

Evangelos Bebetsos, *Democritus University of Thrace*

Yannis Theodorakis is a professor of Sport Psychology in the Department of Physical Education and Sport Science at the University of Thessaly, Greece. He has published more than 34 books and chapters, and more than 270 articles in the areas of physical education, sport and exercise psychology, health psychology, Olympic education, health education, goals setting, self-talk, and attitude and behaviour relationships. He has been involved in several projects related to physical activity promotion, health education, exercise and smoking, exercise program in patients with dementia by using virtual reality, the role of sports in addiction recovery, and equality in society through sports.

Η ΜΟΥΣΙΚΟΚΙΝΗΤΙΚΗ ΑΓΩΓΗ ORFF ΣΥΝΑΝΤΑ ΤΙΣ ΜΟΥΣΙΚΟΧΟΡΕΥΤΙΚΕΣ ΠΑΡΑΔΟΣΕΙΣ ΤΩΝ ΛΑΩΝ ΣΤΗ ΔΙΔΑΚΤΙΚΗ ΠΡΑΞΗ

Υπεύθυνη Σεμιναρίου:

Αγαλιανού Ολυμπία

Περιγραφή:

Η ενότητα της μουσικής του λόγου και της κίνησης αποδίδει το περιεχόμενο και το νόημα στις τέχνες της μουσικής και της όρχησης στην αρχαία Ελλάδα και είναι εμφανής στις μουσικοχορευτικές παραδόσεις των λαών. Η μουσικοκινητική αγωγή Orff (Orff-Schulwerk) με έμπνευση την αρχαιοελληνική σκέψη και με περιεχόμενο που, σε μεγάλο βαθμό, αντλείται ή εμπνέεται από τις παραδόσεις των λαών, αποτελεί μια ευρύτατα διαδεδομένη προσέγγιση στην παιδαγωγική του χορού και της μουσικής. Οι τεχνικές της μουσικοκινητικής αγωγής Orff αξιοποιούν την προφορικότητα και την ομαδοσυνεργατικότητα αποβλέποντας στην ενίσχυση της ομαδικής και ατομικής εκφραστικότητας και δημιουργικότητας ατόμων κάθε ηλικίας. Στο σεμινάριο θα αξιοποιήσουμε μουσικοχορευτικές παραδόσεις από την Ελλάδα και άλλες χώρες στη διδακτική πράξη με όχημα αρχές και τεχνικές της μουσικοκινητικής αγωγής Orff. Ιδιαίτερη έμφαση θα δοθεί στην ανάλυση του προτεινόμενου υλικού και στη λειτουργία του ως αφετηρία για δημιουργία και έκφραση. Η προσέγγιση που προτείνεται στο σεμινάριο εμπνέεται, επίσης, από τα κινήματα του κοινοτικού χορού και της κοινοτικής μουσικής τα οποία επικοινωνούν στενά και αλληλοεπιδρούν με την παγκόσμια κοινότητα του Orff-Schulwerk. Ο τρόπος ανάπτυξης της διδασκαλίας επιτρέπει τη συμμετοχή σε κάθε συμμετέχοντα και συμμετέχουσα ανεξάρτητα από το επίπεδο δεξιοτήτων ή τη προ-υπάρχουσα εμπειρία στο χορό και τη μουσική. Σκοπός του σεμιναρίου είναι να αναδείξει τον τρόπο που η μουσικοκινητική αγωγή Orff μπορεί να διαμεσολαβήσει ανάμεσα στο χορό και τη μουσική στην κοινότητα και στον κοινοτικό χορό και την κοινοτική μουσική σε ποικίλα εκπαιδευτικά πλαίσια τυπικής και μη τυπικής εκπαίδευσης.

Εισηγήτρια:

Ολυμπία Αγαλιανού

Η **Ολυμπία Αγαλιανού** είναι Διδάκτωρ του τμήματος Φ.Π.Ψ. και πτυχιούχος Τ.Ε.Φ.Α.Α. (Ε.Κ.Π.Α.), απόφοιτος της Διετούς Μεταπτυχιακής Επιμόρφωσης Μουσικοκινητικής Αγωγής Carl Orff (Σχολή Μωραΐτη), πτυχιούχος Αρμονίας, και τελειόφοιτος χοροθεραπεύτρια με τετραετής εκπαίδευση στη συστημική συμβουλευτική. Είναι συγγραφέας μια μονογραφίας δημοσιευμένων άρθρων σε επιστημονικά περιοδικά και πρακτικά συνεδρίων και είναι μέλος της συγγραφικής ομάδας των βιβλίων Φυσικής Αγωγής για το Δημοτικό Σχολείο και άλλων συλλογικών έργων. Από το 1995 ασχολείται με την εκπαίδευση-επιμόρφωση ενηλίκων σε θέματα μουσικοκινητικής αγωγής Orff στην Ελλάδα και το εξωτερικό.Έχει υπηρετήσει επί είκοσι χρόνια στην πρωτοβάθμια εκπαίδευση. Σήμερα υπηρετεί ως Ε.Ε.Π. στο Τ.Ε.Α.Π.Η., Ε.Κ.Π.Α. και διδάσκει σε μεταπτυχιακά προγράμματα των πανεπιστημίων Ε.Κ.Π.Α., ΠΑ.ΜΑΚ και Δ.Π.Θ.

ORFF-SCHULWERK INTEGRATES CULTURAL TRADITIONS OF DANCE AND MUSIC WITHIN EDUCATIONAL PRACTICES

Workshop Director:

Olympia Agalianou

Description:

The unity of music, speech, and movement is the content and meaning of the arts of music and 'orchesis' in the ancient Greek civilization, and is also common phenomenon in the musical and dance traditions of the peoples. Orff-Schulwerk, inspired by ancient Greek concepts, draws significantly from various cultural traditions, making it a widely used method in music and dance pedagogy. During teaching, orality and teamwork are utilized with the aim of enhancing both group and individual expressiveness and creativity of individuals of all ages. During the seminar, we will utilize music and dance traditions from Greece and other countries as educational means, following the principles and techniques of Orff-Schulwerk. Special emphasis will be placed on analyzing the proposed material as a starting point for creation and expression. The approach of this seminar is also inspired by the community dance and community music movements, which closely communicate and interact with the international Orff-Schulwerk community.The teaching scaffolding seeks to engage each participant regardless of skill level or pre-existing experience in dance and music. The purpose of the seminar is to propose a way in which Orff-Schulwerk can facilitate dance and music in the community as community dance and community music in both formal and non-formal educational contexts

Workshop Instructor:

Olympia Agalianou

Olympia Agalianou holds a PhD in pedagogy and a degree in P.E. and Sport Science (N.K.U.A.). Music studies (harmony degree). Two-year course in Orff-Schulwerk, three years course in dance therapy and four-year studies in systemic counselling. Writer of a monography, chapters in collective books articles in scientific journals and conference proceedings and school text books. Since 1995 he has been working as an educator in lifelong education in Greece and abroad. She taught for 20 years in primary education. Today, serves as Special Educational Staff in the Department of Early Childhood Education at N.K.U.A., teaches at master's degree postgraduate programs at N.K.U.A., University of Macedonia, Democritus University of Thrace.

ΠΕΡΑ ΑΠΟ ΤΟΥΣ ΜΥΕΣ: ΜΙΑ ΟΛΙΣΤΙΚΗ ΠΡΟΣΕΓΓΙΣΗ ΤΗΣ ΑΣΚΗΣΗΣ ΓΙΑ ΤΟΝ ΣΥΓΧΡΟΝΟ ΕΠΑΓΓΕΛΜΑΤΙΑ

Υπεύθυνη Σεμιναρίου:

Ερασμία Γιαννακού, *ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Περιγραφή:

Το σεμινάριο αφορά στην ανάλυση της ψυχοσωματικής σύνδεσης και την παρουσίαση επιστημονικών δεδομένων σχετικά με την αναγκαιότητα για ολιστική προσέγγιση της άσκησης. Θα ερμηνευθούν θεωρητικά αλλά και βιωματικά (μέσω ασκήσεων και τεχνικών) οι όροι “ψυχοσωματική σύνδεση”, “σωματική επίγνωση”, “ενδοδεκτικότητα”, “συνειδητή κίνηση” κ.α Στόχος του σεμιναρίου είναι να αποκομίσουν οι συμμετέχοντες σε αυτό, όσο το δυνατόν περισσότερα εφόδια για την ολοκληρωμένη προσέγγιση ενός ασκούμενου, ανεξαρτήτως από το είδος προπόνησης που ακολουθεί, πράγμα που θα τους καταστήσει περισσότερο αποτελεσματικούς και επομένως ανταγωνιστικούς στην αγορά εργασίας. Το σεμινάριο θα διεξαχθεί σε κλειστό χώρο και θα περιλαμβάνει 2 ώρες θεωρία και 1 ώρα πράξη.

Εισηγήτρια:

Χρυσάνθη Συρεσιώτη, *MSc*

Η Χρυσάνθη Συρεσιώτη είναι απόφοιτη του ΤΕΦΑΑ του ΕΚΠΑ και κάτοχος μεταπτυχιακού τίτλου σπουδών από το ΤΕΦΑΑ του ΔΠΘ, με εξειδίκευση στην "Πρόληψη- Παρέμβαση - Αποκατάσταση". Δραστηριοποιείται στον χώρο της άσκησης από το 2006, έχοντας εργαστεί τόσο στην έρευνα όσο και στο πεδίο, διδάσκοντας κίνηση σε ενήλικες και παιδιά, σε ομαδικά αλλά και ατομικά προγράμματα. Έχει συνεργαστεί με γυμναστήρια, studios, κέντρα αποκατάστασης, αθλητικούς συλλόγους, σχολές χορού κ.α. Μέσα από συνεχή επιμόρφωση (συνέδρια, σεμινάρια, εκπαιδεύσεις όπως: Clinical Pilates, αποκατάσταση σπονδυλικής στήλης, Pilates, Yoga, Prenatal Pilates, θετική ψυχολογία κ.ά.), αλλά και προσωπική μελέτη, έχει αναπτύξει μια ολιστική μέθοδο προσέγγισης των ασκουμένων, η οποία βασίζεται στην άρρηκτη σχέση ψυχισμού και σωματικής λειτουργίας. Η προσέγγιση αυτή στοχεύει στην επανεκπαίδευση των μοτίβων κίνησης και στάσης, στην ενίσχυση της σωματικής επίγνωσης και στη βελτίωση ή διατήρηση της υγείας και της φυσικής κατάστασης, με έμφαση στην πρόληψη.

BEYOND MUSCLES: A HOLISTIC APPROACH TO EXERCISE FOR THE MODERN EXERCISE PROFESSIONAL

Seminar Director:

Erasmia Giannakou, *DPESS, Democritus University of Thrace*

Description:

The seminar deals with the analysis of the psychosomatic connection and the presentation of scientific data about the necessity for a holistic approach to exercise. The terms "body and mind connection", "body awareness", "interoception", "conscious movement" etc. will be interpreted theoretically as well as experientially (through exercises and techniques). The aim of the seminar is for the participants to gain as much as possible resources for the integrated approach of a trainee regardless of the type of training they follow, which will make them more efficient and therefore competitive in the labor market. The seminar will be held indoors and will include 2 hours of theory and 1 hour of practice.

Instructor:

Chrysanthi Syresioti, *MSc*

Mrs Chrysanthi Syresioti is UOA/DPESS Graduate and holder of a master's degree from the DUTH/DPESS, with a specialization in "Prevention–Intervention–Rehabilitation". Since 2006, she has been active in the field of fitness, working both in research and in practice, teaching movement to adults and children through group and individual sessions. She has collaborated with gyms, studios, rehabilitation centers, sports clubs, dance schools etc. Through continuous professional development (conferences, workshops, and trainings such as Clinical Pilates, spinal rehabilitation, Pilates, Yoga, Prenatal Pilates, positive psychology, etc.) as well as personal study, she has developed a holistic approach to her clients, based on the inseparable connection between mind and body. This approach aims to retrain movement and posture patterns, enhance body awareness, and improve or maintain health and physical fitness, with a strong emphasis on prevention.

ΨΥΧΟΛΟΓΙΚΗ ΥΠΟΣΤΗΡΙΞΗ ΚΑΙ ΣΧΕΔΙΑΣΜΟΣ ΠΡΟΓΡΑΜΜΑΤΩΝ ΑΣΚΗΣΗΣ ΠΡΙΝ ΚΑΙ ΜΕΤΑ ΑΠΟ ΕΝΑ ΧΕΙΡΟΥΡΓΕΙΟ ΝΟΣΟΓΟΝΟΥ ΠΑΧΥΣΑΡΚΙΑΣ

Διευθύντρια Σεμιναρίου:

Ελένη Δούδα, *Καθηγήτρια Τ.Ε.Φ.Α.Α. – Δ.Π.Θ.*

Συντονίστρια Σεμιναρίου:

Στυλιανή Καρακύριου, *Μέλος Ε.Ε.Π.*

Περιγραφή:

Η βαριατρική και μεταβολική χειρουργική αποτελεί μία από τις πιο αποτελεσματικές παρεμβάσεις για την αντιμετώπιση της νοσογόνου παχυσαρκίας και των συναφών μεταβολικών διαταραχών. Ωστόσο, η μακροχρόνια επιτυχία της εξαρτάται σε μεγάλο βαθμό από την υιοθέτηση ενός ολοκληρωμένου θεραπευτικού πλαισίου, το οποίο περιλαμβάνει την ψυχολογική υποστήριξη των ατόμων με παχυσαρκία καθώς και την εφαρμογή αλλαγών στον τρόπο ζωής. Στο πλαίσιο αυτό, η σωματική άσκηση διαδραματίζει καθοριστικό ρόλο τόσο στην προεγχειρητική προετοιμασία όσο και στη μετεγχειρητική αποκατάσταση. Στο σεμινάριο θα παρουσιαστούν στρατηγικές ψυχολογικής υποστήριξης, καθώς και αρχές σχεδιασμού ασφαλών και αποτελεσματικών προγραμμάτων άσκησης πριν και μετά από χειρουργική επέμβαση για την αντιμετώπιση της νοσογόνου παχυσαρκίας.

Εισηγητές:

Τσατάλη Μαριάννα, *Κλινική Ψυχολόγος με ειδίκευση στην βαριατρική, Επιστημονική Συνεργάτης Κλινικής Νοσογόνου Παχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης*

Ψυχολογική υποστήριξη πριν και μετά από ένα χειρουργείο νοσογόνου παχυσαρκίας

Βασίλειος Ξυραφόπουλος, *MSc, Καθηγητής Φυσικής Αγωγής, Εξειδικευμένος Επαγγελματίας Άσκησης και Υγείας, Επιστημονικός Συνεργάτης Κλινικής ΝοσογόνουΠαχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης*

Σχεδιασμός ασφαλών προγραμμάτων άσκησης πριν και μετά από ένα χειρουργείο νοσογόνου παχυσαρκίας

Πρακτική Εφαρμογή:

Ελένη Κατή, Επιστημονική Συνεργάτης Κλινικής Νοσογόνου Παχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης

Ιωάννης Παπαδόπουλος, Επιστημονικός Συνεργάτης Κλινικής Νοσογόνου Παχυσαρκίας & Μεταβολικών Νοσημάτων, Ιατρικό Διαβαλκανικό Θεσσαλονίκης

Η **Μαριάννα Τσατάλη** αποφοίτησε από το Τμήμα Ψυχολογίας του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης, και στη συνέχεια ολοκλήρωσε τον τίτλο των μεταπτυχιακών της σπουδών, στην Ιατρική Ψυχολογία και Αντιμετώπιση του Χρόνιου Πόνου στην Ιατρική σχολή του Πανεπιστημίου Ιωαννίνων. Το 2018 ολοκλήρωσε τη διδακτορική της διατριβή με στο τμήμα Ψυχολογίας του Πανεπιστημίου Sheffield στο Ηνωμένο Βασίλειο. Επίσης, είναι ψυχοθεραπεύτρια με ειδίκευση στη Γνωστικοσυμπεριφορική ψυχοθεραπεία και τη Θεραπεία Αποδοχής και Δέσμευσης, ενώ παράλληλα έχει συμμετάσχει στο Μεταπτυχιακό πρόγραμμα σπουδών Διατροφικής ψυχολογίας και είναι Master Practitioner στις Διατροφικές Διαταραχές και την Παχυσαρκία, από το Κέντρο Εκπαίδευσης και Αντιμετώπισης Διατροφικών Διαταραχών (ΚΕΑΔΔ), σε συνεργασία με το Εθνικό Κέντρο Διατροφικών Διαταραχών της Μεγάλης Βρετανίας [(National Center of Eating Disorders (NCFED)]. Στο παρόν είναι συνεργάτιδα της Διεπιστημονικής Ομάδας του Τμήματος Νοσογόνου Παχυσαρκίας και Μεταβολικών Διαταραχών στο Ιατρικό Διαβαλκανικό Κέντρο Θεσσαλονίκης και παράλληλα, είναι ερευνήτρια του Network Ageing Research του Πανεπιστημίου της Χαϊδελβέργης και του Πανεπιστημιακού νοσοκομείου ‘Ain Shams’ στο Κάιρο. Έχει δημοσιεύσει πάνω από 50 άρθρα σε διάφορα επιστημονικά περιοδικά, ενώ και έχει παρουσιάσει εργασίες σε πάνω από 70 διεθνή και ευρωπαϊκά συνέδρια.

Ο **Βασίλειος Ξυραφόπουλος** είναι Γυμναστής και Επιστημονικός Συνεργάτης στη Χειρουργική Κλινική Νοσογόνου Παχυσαρκίας και Μεταβολικών Διαταραχών του Ιατρικού Διαβαλκανικού Κέντρου Θεσσαλονίκης. Είναι πτυχιούχος του Τμήματος Επιστήμης Φυσικής Αγωγής και Αθλητισμού του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης και κάτοχος Μεταπτυχιακού Διπλώματος Ειδίκευσης στην Κλινική Άσκηση και τις Εφαρμογές της Τεχνολογίας στην Υγεία, πρόγραμμα που υλοποιήθηκε από το Δημοκρίτειο Πανεπιστήμιο Θράκης σε συνεργασία με το Εθνικό Κέντρο Έρευνας Φυσικών Επιστημών «ΔΗΜΟΚΡΙΤΟΣ» - Ινστιτούτο Πληροφορικής και Τηλεπικοινωνιών. Η επαγγελματική του δραστηριότητα επικεντρώνεται στον σχεδιασμό, την εφαρμογή και την αξιολόγηση εξατομικευμένων προγραμμάτων άσκησης σε άτομα με μεταβολικές, μυοσκελετικές και άλλες χρόνιες παθήσεις. Διαθέτει πολυετή εμπειρία στη διαχείριση βάρους μέσω στοχευμένης φυσικής δραστηριότητας, ενώ έχει συνεργαστεί με ιδιωτικά κέντρα άσκησης, αθλητικούς συλλόγους και ακαδημαϊκούς φορείς στην Ελλάδα και στο εξωτερικό. Έχει συμμετάσχει με ανακοινώσεις και εισηγήσεις σε επιστημονικά συνέδρια Φυσικής Αγωγής, Κλινικής Άσκησης και fitness στην Ευρώπη, προάγοντας την τεκμηριωμένη γνώση στον τομέα της άσκησης και υγείας. Το ερευνητικό και κλινικό του ενδιαφέρον επικεντρώνεται στην εξατομικευμένη

προσαρμογή της άσκησης ως μέσου πρόληψης, αποκατάστασης και βελτίωσης της ποιότητας ζωής. Ιδιαίτερα, η συμβολή του στην υποστήριξη ασθενών πριν και μετά από βαριατρικές επεμβάσεις αποτελεί βασικό άξονα της κλινικής του εμπειρίας, μέσω προγραμμάτων φυσικής δραστηριότητας που εστιάζουν στη λειτουργική ικανότητα, τον μεταβολισμό και τη μακροχρόνια υγεία.

Διϊδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών
Κλινική Άσκηση &
Εφαρμογές της Τεχνολογίας στην Υγεία

PSYCHOLOGICAL SUPPORT AND DESIGN OF EXERCISE PROGRAMS BEFORE AND AFTER BARIATRIC SURGERY IN MORBID OBESITY

Director:

Helen Douda, Professor D.P.E.S.S. – D.U.Th.

Coordinator:

Styliani Karakiriou, Specialized Teaching Staff D.P.E.S.S. – D.U.Th.

Description:

Bariatric and metabolic surgery is one of the most effective interventions for the treatment of morbid obesity and its associated metabolic disorders. However, its long-term success largely depends on the adoption of a comprehensive therapeutic approach that includes psychological support for individuals with obesity, as well as the implementation of sustainable lifestyle changes. Within this framework, physical exercise plays a pivotal role in both preoperative preparation and postoperative recovery. This seminar will present strategies for psychological support, along with key principles for designing safe and effective exercise programs before and after bariatric surgery for the management of morbid obesity.

Speakers:

Marianna Tsatali, Clinical Psychologist specializing in Bariatric Care, Scientific Collaborator of the Morbid Obesity & Metabolic Diseases Surgery Clinic, Inter-Balkan Medical Center of Thessaloniki

Psychological Support Before and After Bariatric Surgery

Vasileios Xyrafopoulos, MSc, Physical Education Teacher, Exercise and Health Specialist, Scientific Collaborator of the Morbid Obesity & Metabolic Diseases Surgery Clinic, Inter-Balkan Medical Center of Thessaloniki

Design of safe exercise programs before and after bariatric surgery

Practical Application:

Eleni Kati, Scientific Collaborator of the Morbid Obesity & Metabolic Diseases Surgery Clinic, Inter-Balkan Medical Center of Thessaloniki

Ioannis Papadopoulos, Scientific Collaborator of the Morbid Obesity & Metabolic Diseases Surgery Clinic, Inter-Balkan Medical Center of Thessaloniki

Marianna Tsatali graduated from the Department of Psychology at the Aristotle University of Thessaloniki and went on to complete her Master's degree in Medical Psychology and the Management of Chronic Pain at the Medical School of the University of Ioannina. In 2018, she was awarded her PhD in Psychology from the University of Sheffield in the United Kingdom.

She is a psychotherapist specialized in Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT). Additionally, she has participated in the postgraduate program in Nutritional Psychology and is a Master Practitioner in Eating Disorders and Obesity, certified by the Center for Education and Treatment of Eating Disorders (KEADD), in collaboration with the National Centre for Eating Disorders (NCFED), UK. Currently, she collaborates with the Psychologist at the Department of Obesity and Metabolic Disorders at the Inter-Balkan Medical Center of Thessaloniki. In addition, she is a research fellow at the Network Ageing Research of Heidelberg University and at Ain Shams University Hospital in Cairo. She has published more than 50 articles in international scientific journals and has presented over 70 papers at international and European conferences.

Vasileios Xyrafopoulos is an Exercise Specialist and Scientific Associate at the Bariatric and Metabolic Surgery Clinic of the Inter-Balkan Medical Center of Thessaloniki. He holds a Bachelor's degree in Physical Education and Sport Science from the Aristotle University of Thessaloniki and a Master of Science in Clinical Exercise and Applications of Technology in Health, a joint program of the Department of Physical Education and Sport Science of the School of Physical Education, Sport Science and Occupational Therapy of Democritus University of Thrace in collaboration with the National Center for Science Research "DEMOKRITOS" - The Institute of Informatics and Telecommunications (IIT). His professional expertise focuses on the design, implementation, and evaluation of individualized exercise programs for individuals with metabolic, musculoskeletal, and other chronic conditions. He has extensive experience in weight management through targeted physical activity and has collaborated with private fitness centers, sports clubs, and academic institutions in Greece and abroad. He has presented scientific work and delivered lectures at conferences in the fields of physical education, clinical exercise, and fitness across Europe, contributing to the dissemination of evidence-based knowledge in exercise and health sciences. His scientific and clinical interests are centered on the personalized adaptation of exercise for prevention, rehabilitation, and quality-of-life enhancement. Notably, his clinical expertise includes supporting patients before and after bariatric surgery through individualized physical activity programs aimed at improving functional capacity, metabolic outcomes, and long-term health.

Postgraduate Program: "**Clinical Exercise and Applications of Technology in Health**" **Department of Physical Education and Sport Science of the School of Physical Education, Sport Science and Occupational Therapy** of **Democritus University of Thrace** in collaboration with the **National Center for Science Research "DEMOKRITOS" - The Institute of Informatics and Telecommunications (IIT).**

Interinstitutional Postgraduate Studies Program
Clinical Exercise &
Technologies Application in Health

ΣΕΜΙΝΑΡΙΟ AEROJUMP

Υπεύθυνη Σεμιναρίου - Συντονίστρια:

Όλγα Κούλη, *Αναπληρώτρια Καθηγήτρια ΤΕΦΑΑ, Δημοκρίτειο Πανεπιστήμιο Θράκης*

Εισηγήτρια:

Βενετία Λασκαρίδη, *Απόφοιτη προπτυχιακού και μεταπτυχιακού προγράμματος ΤΕΦΑΑ - ΔΠΘ, ιδιοκτήτρια σχολών χορού Let's dance και Let's Move and play με έδρα την Κομοτηνή, Aerobic and Step instructor*

Περιγραφή:

Ανακάλυψε τον συναρπαστικό κόσμο του **AeroJump** σε ένα ολοκληρωμένο σεμινάριο που συνδυάζει θεωρία και πράξη! Στο παρόν σεμινάριο οι συμμετέχοντες θα μάθουν τα οφέλη της άσκησης με **kangoo boots**, τη σωστή τεχνική και τρόπους πρόληψης τραυματισμών, ενώ θα απολαύσεις μια **δυναμική προπόνηση** γεμάτη ενέργεια και μουσική. Είτε είναι αρχάριοι είτε έμπειροι οι συμμετέχοντες, αυτό το σεμινάριο θα τους βοηθήσει να γνωρίσουν ένα ακόμη τρόπο για να μπορέσουν να **βελτιώσουν τη φυσική σου κατάσταση** και να διασκεδάσουνμε έναν μοναδικό τρόπο!

Το **AeroJump** είναι μια **έντονη αερόβια άσκηση** που εκτελείται με ειδικά σχεδιασμένες μπότες με ελατήρια, γνωστές ως **kangoo boots**. Αυτές οι μπότες απορροφούν τους κραδασμούς, μειώνοντας την πίεση στις αρθρώσεις, ενώ παράλληλα προσφέρουν **διασκέδαση, ενδυνάμωση και καύση θερμίδων**.

Το AeroJump απευθύνεται σε όλους και χρησιμοποιείται σε **ομαδικά προγράμματα γυμναστηρίου**, **προπονήσεις αντοχής** και **αποκατάσταση τραυματισμών**. Είναι μια εξαιρετική επιλογή για όσους θέλουν να γυμναστούν **αποτελεσματικά, διασκεδαστικά και με ασφάλεια**!

ΕΝΟΤΗΤΑ Ι: Θεωρητική Προσέγγιση

Εισαγωγή στην άσκηση με kangoo boots

- Τι είναι το AeroJump;
- Ιστορία και εξέλιξη αυτού του είδους άσκησης;
- Γιατί να το επιλέξει κάποιος;

Οφέλη & Επιστημονικά Δεδομένα

- Οφέλη για την καρδιοαναπνευστική αντοχή
- Ενδυνάμωση μυών & επιπτώσεις στις αρθρώσεις
- Σύγκριση με άλλα αθλήματα υψηλής έντασης

- Ψυχολογικά οφέλη & διασκέδαση

Εξοπλισμός & Ασφάλεια

- Παρουσίαση του Kangoo boots
- Επιλογή κατάλληλου μεγέθους
- Συντήρηση του εξοπλισμού
- Μέτρα ασφαλείας και αποφυγή τραυματισμών

Τεχνική & Βασικές Κινήσεις

- Σωστή στάση σώματος
- Ισορροπία και έλεγχος κινήσεων
- Βασικές ασκήσεις προσαρμογής

ΕΝΟΤΗΤΑ ΙΙ: Πρακτική Προσέγγιση

Προθέρμανση

- Ενεργοποίηση αρθρώσεων και μυών
- Απλές ασκήσεις ισορροπίας

Βασικές Κινήσεις & Χορογραφία

- Βηματολόγιο αρχαρίων
- Απλές και σύνθετες κινήσεις
- Ρυθμική προπόνηση με μουσική
- Δημιουργία μικρής χορογραφίας

Δυναμικό Πρόγραμμα Άσκησης

- Cardio & ενδυνάμωση με Kangoo boots
- Συνδυαστικές κινήσεις για μέγιστη καύση θερμίδων
- Fun workout session

Αποθεραπεία & Διατάσεις

- Αποκατάσταση μυών
- Χαλάρωση και αναπνοές

Κλείσιμο Σεμιναρίου

- Ανασκόπηση του σεμιναρίου

- Απαντήσεις σε ερωτήσεις
- Μικρή συζήτηση & feedback από τους συμμετέχοντες

AEROJUMP SEMINAR

Workshop Director:

Olga Kouli, *Associate Professor, DPESS, Democritus University of Thrace*

Seminar Instructor:

Venetia Laskaridi, *Graduate of the undergraduate and postgraduate programs of DPESS, Democritus University of Thrace, owner of the dance schools Let's Dance and Let's Move and Play, based in Komotini, Aerobic and Step instructor*

Description:

Discover the exciting world of AeroJump in a comprehensive seminar that combines theory and practice! In this seminar, participants will learn about the benefits of exercising with Kangoo boots, the correct technique, and injury prevention methods, while enjoying a dynamic workout full of energy and music. Whether they are beginners or experienced, this seminar will introduce them to a new way to improve their fitness and have fun in a unique way!

AeroJump is a high-intensity aerobic workout performed with specially designed rebound boots, known as Kangoo Boots. These boots absorb shock, reducing stress on the joints, while also providing fun, muscle strengthening, and calorie burning.

AeroJump is suitable for everyone and is used in group fitness programs, endurance training, and injury rehabilitation. It's an excellent choice for those who want to work out effectively, enjoyably, and safely!

SECTION I: Theoretical Approach

Introduction to kangoo boots

- What is AeroJump?
- History and evolution of this kind of exercise
- Why to choose it?

Benefits & Scientific Data

- Benefits for cardiovascular endurance
- Muscle strengthening & impact on joints
- Comparison with other high-intensity sports
- Psychological benefits & fun

Equipment & Safety

- Introduction to AeroJump
- Choosing the right size
- Equipment maintenance
- Safety measures and injury prevention

Technique & Basic Movements

- Proper body posture
- Balance and movement control
- Basic adaptation exercises

SECTION II: Practical Approach

Warm-up

- Joint and muscle activation
- Basic balance exercises

Basic Movements & Choreography

- Beginner step patterns
- Simple and complex movements
- Rhythmic training with music
- Creation of a short choreography

Dynamic Workout Program

- Cardio & strengthening with Kangoo boots
- Combined movements for maximum calorie burn
- Fun workout session

Cool-down & Stretching

- Muscle recovery
- Relaxation and breathing exercises

Seminar Closing

- Seminar recap
- Q&A session
- Brief discussion & participant feedback

ΠΕΡΙΛΗΨΕΙΣ

ABSTRACTS

ΠΡΟΣΑΡΜΟΣΜΕΝΗ ΦΥΣΙΚΗ ΔΡΑΣΤΗΡΙΟΤΗΤΑ-ΑΣΚΗΣΗ & ΑΤΟΜΑ ΜΕ ΑΝΑΠΗΡΙΑ

ADAPTED PHYSICAL ACTIVITY-EXERCISE AND DISABILITY

COMPARISON OF THE TRADITIONAL METHOD OF ADMINISTERING THE TGMD-3 AND AN ALTERNATIVE APPROACH USING THE GMS APPLICATION, IN THE ASSESSMENT OF GROSS MOTOR SKILLS: A CASE STUDY OF A GIRL WITH AUTISM SPECTRUM DISORDER.

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Motor competence is an integral part of the holistic development of children with Autism Spectrum Disorder (ASD), providing the foundation for physical activity and, consequently, opportunities for social interaction and cognitive experiences. For this reason, the early identification of motor difficulties in children through the use of gross motor assessment tools is particularly important. The Test of Gross Motor Development-3 (TGMD-3) has been successfully used with children with ASD, and more recently, the GMS application has been developed to support its administration digitally. This raises the question of whether digital applications can offer a complementary solution for assessing the motor skills of children with ASD while also enhancing their motivation to engage in the assessment process. From this perspective, the present case study attempted a pilot comparison between the traditional administration of the TGMD-3 and its administration through the use of the application. The sample consisted of a 13-year-old girl with ASD and intellectual disability, with a certified disability rate of 90%. The participant was first assessed using the traditional TGMD-3 protocol and then, one week later, at the same time, on the same day, and under the same conditions, she was assessed using the GMS application. In addition, after the completion of each protocol, an adapted version of the Intrinsic Motivation Inventory (IMI) was administered in order to investigate intrinsic motivation. The girl responded by indicating emojis corresponding to a five-point Likert scale. The results showed a very small difference between the two assessment methods, in favor of the application-based method. In addition, a small difference was identified in two items of the IMI interest/enjoyment subscale, with the girl reporting a more positive subjective enjoyment during the assessment conducted through the application. Overall, the application appeared to provide a comparable assessment profile to the traditional TGMD-3 method, while also being associated with slightly greater enjoyment for the child. These findings support the potential of digital tools as a complementary method of assessment. However, no generalizations can be made due to the pilot nature of the study.

Keywords: Autism Spectrum Disorder,Gross Motor Skills,TGMD-3,Digital assessment

EFFECT OF A REMOTELY SUPERVISED MAT PILATES PROGRAM ON FUNCTIONAL OUTCOMES AND FATIGUE IN MULTIPLE SCLEROSIS: A CASE STUDY

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The purpose of this case study was to investigate the effects of a remotely delivered mat Pilates program on functional mobility, balance, functional exercise capacity and perceived fatigue in an individual with multiple sclerosis. The participant was a 47-year-old woman diagnosed with relapsing-remitting multiple sclerosis (Expanded Disability Status Scale: 2.5) presenting with instability andfatigue affecting daily activities. Assessments were conducted prior to the initiation of the intervention program and following its conclusion. Functional mobility was evaluated using the Timed Up and Go (TUG) test, functional exercise capacity using the 6-Minute Walk Test (6MWT), static and dynamic balance using the Berg Balance Scale (BBS) and perceived fatigue using the Modified Fatigue Impact Scale (MFIS). The intervention consisted of an 8-week remotely supervised mat Pilates program (3 sessions/week, 60 minutes/session). Sessions were delivered via real-time videoconferencing. The exercise protocol was based on mat Pilates exercises with minimal equipment and included: a) warm-up with dynamic stretching (10 min), b) main exercise component with bodyweight core exercises, dumbbells and resistance band exercises for lower and upper extremities (45 min) and c) cool-down with static stretching (5 min). Exercise intensity ranged from moderate to high and was progressively adjusted according to the participant's ability. Rest intervals between sets were reduced from 90 to 30 seconds over the course of the program. The results demonstrated clinically meaningful improvements across all measured parameters following the intervention program. TUG time decreased from 8.8 to 7.05s (Δ = -1,75s), 6MWT distance improved from 280 to 400m (Δ = +120m), BBS improved from 50/56 to 56/56 reaching the maximum score. In addition, perceived fatige was no longer reported, with MFIS score decreasing from 44/84 to 0/84. The participant completed all sessions with no adverse events reported. These findings suggest that a remotely delivered mat Pilates program may be a feasible intervention with potential benefits for improving functional mobility, functional exercise capacity, balance and fatigue management in individuals with multiple sclerosis.

Keywords: Multiple Sclerosis, mat Pilates, remote exercise, balance, fatigue, functional mobility, functional capacity

EFFECT OF COMPETITIVE TAEKWONDO TRAINING ON THE PHYSICAL FITNESS OF CHILDREN WITH CEREBRAL PALCY

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The aim of the study was to investigate the effect of a competitive Taekwondo training program on the physical fitness of children with cerebral palsy. Ten children (age: 6-21 years, height: 1.42 ± 0.24 m, weight: 40.40 ± 23.45 kg) diagnosed with cerebral palsy (GMFCS Levels I-II) participated in the study. Initially, a typical Taekwondo training program was implemented for one month (3 sessions/week), serving as an introductory phase to help children acquire and become familiar with the sport's basic skills. This was followed by an 8-weeks competitive Taekwondo training protocol, emphasizing on power development (5 sessions/week). Each training session lasted 60 minutes and included: a) a warm-up consisting of stretching and running exercises (5-10 min), b) static kicking, blocking and step-based target kicking (3 sessions/week)or poomsae and upper- and lower-limb strengthening exercises (2 sessions/ week) and c) a cool-down with stretching exercises. Physical fitness was assessed using the 15m Muscle Power Sprint Test (MSPT) for speed and power, the 10m Shuttle Run Test for aerobic endurance, the Seated Throw Test for upper-body strength and the Sit-to-Stand and Lateral Step Tests for lower-body power and strength. Passive range of motion of the hip, knee and ankle joints of both lower limbs was evaluated using goniometry. Participants were assessed at four time points: prior to the preliminary program, prior to the intervention program, immediately after the completion of the intervention and two months post-intervention. The results demonstrated that the introductory Taekwondo program had a statistically significant effect only on 10m Shuttle Run test ($p<0.05$) and Lateral Step Test ($p<0.05$) outcomes. Following the competitive Taekwondo training intervention, a statistically significant improvement in performance was observed in the Sit-to-Stand ($p<0.01$), Seated Throw ($p<0.01$), MPST ($p<0.05$), 10m Shuttle Run Test ($p<0.05$) and Lateral Step Test ($p<0.05$). In addition, passive range of motion improved significantly in hip flexion of the non-paretic lower limb ($p<0.05$) and in knee ($p<0.05$) and ankle ($p<0.01$) joints of both lower limbs. In conclusion, a competitive Taekwondo training program appears to be an effective intervention for improving multiple components of physical fitness in children with cerebral palsy (GMFCS I-II).

Keywords: cerebral palsy, Taekwondo, physical fitness, adapted sports

EFFECTS OF AN ADAPTED SWIMMING WITH VISUAL PROMPTS PROGRAM ON EXECUTIVE FUNCTIONS IN CHILDREN WITH AUTISM SPECTRUM DISORDER (ASD) AND INTELLECTUAL DISABILITY (ID)

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Executive functions (EF) are higher-order cognitive processes supporting goal-directed behavior, learning, and adaptation. Children with autism spectrum disorder (ASD) and intellectual disability (ID) often show EF deficits affecting attention, planning and self-regulation. While visual and physically engaging interventions can enhance EF, their combined use in aquatic programs remains underexplored. This study examined the effects of an adapted swimming program with visual prompts on EF and frontal lobe activation in children with ASD and ID. Twenty-nine children aged 6–15 years (19 with ASD, 10 with ID) were randomly assigned to an experimental group (EG; n = 17) or control group (CG; n = 12). The EG completed a 14-week adapted swimming program (two 60-minute sessions/week) with visual supports including picture cards and short video prompts. Executive performance was assessed pre- and post-intervention using an exergame ('Squid Hero for Kinect' by Visual Air Guitar Company) measuring score and completion time, while dorsolateral prefrontal cortex activation was monitored via fNIRS (HdDiff). Post-intervention, the EG showed significantly higher exergame scores than the CG ($p = .012$), with improvements seen in both ASD and ID subgroups; ID participants in the EG outperformed their CG counterparts ($p = .011$). No group differences were found in completion time or overall HdDiff, though post-intervention HdDiff differed between ASD and ID within the EG, indicating distinct neural engagement patterns. Overall, the findings indicate that an adapted swimming program enriched with visual prompts may support improvements in visual–motor processing and executive task performance in children with ASD and ID. Although neurophysiological changes in prefrontal activation were limited, the results highlight the potential of visually structured aquatic interventions as a complementary approach for enhancing cognitive and motor functioning in children with neurodevelopmental disorders.

Keywords: Children, ASD, ID, Executive function, Adapted Swimming, Visual Prompts

INCLUSIVE PHYSICAL EDUCATION FOR STUDENTS WITH SPECIAL EDUCATIONAL NEEDS

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Inclusive Physical Education constitutes a key factor for the equal participation of all students, including those with disabilities. Contemporary education is shifting from the traditional model of exclusion to a model of inclusion, in which Physical Education represents a critical field of application, as it integrates motor, social, and emotional skills. The purpose of the present study was to investigate the role of Physical Education in the inclusion of students with special educational needs through a literature review. The research data were collected through a review of the literature in databases such as Google Scholar, Scopus, ResearchGate, and Microsoft Academic. The keywords used for the search included “physical education,” “inclusion,” “educational needs,” “disability,” as well as combinations of these terms. A total of 197 studies related to the research topic were identified. Of these, 149 were excluded from further analysis, as 76 were older than ten years, 51 were already review studies, and 22 did not include any intervention program. The analysis and categorization of the remaining 48 studies revealed that Physical Education: (a) creates a supportive environment for students with special educational needs through a positive teaching climate and the acceptance of diversity; (b) enhances the social inclusion of students with special educational needs by promoting interaction and cooperation with their peers; (c) strengthens the self-esteem and self-confidence of students with special needs; and (d) reduces social stereotypes and prejudices, fostering positive attitudes among students without disabilities toward diversity. In conclusion, inclusive Physical Education is feasible but requires careful planning. Furthermore, its success depends on teacher training, the availability of resources, and collaboration among professionals such as occupational therapists and special education teachers.

Keywords: physical education,inclusion,educational needs,disability

PROMOTING NEUROPLASTICITY AND MITIGATING FATIGUE: THE FUNCTIONAL IMPACT OF ADAPTED EXERCISE IN MULTIPLE SCLEROSIS

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Multiple Sclerosis (MS) is a chronic, progressive neurodegenerative disease of the central nervous system, characterized by debilitating fatigue, motor deficits, and balance disorders that significantly impair patients' quality of life. In Greece, the prevalence of MS is estimated at approximately 1 in 600 individuals, with a higher incidence in women compared to men (2–3:1 ratio). This systematic review aims to evaluate the impact of aerobic and resistance exercise interventions, as well as targeted aquatic therapy, on neuroplasticity, fatigue management, and functional mobility in patients with MS. A literature search was conducted in the PubMed and Google Scholar databases using the keywords: "multiple sclerosis," "aquatic exercise," and "resistance training." Inclusion criteria comprised experimental intervention studies published from 2016 onwards. Five experimental clinical trials were selected, including more than 190 adults, primarily diagnosed with Relapsing-Remitting MS and presenting mild to moderate disability (EDSS 1.0–6.0). The intervention protocols (lasting 8–24 weeks) included functional training (TRX, elastic bands, aerobic exercise), as well as aquatic therapy (Halliwick concept and aquatic resistance training).Assessment tools included: (i) ELISA blood analyses, (ii) the Modified Fatigue Impact Scale (MFIS), (iii) the Berg Balance Scale, and (iv) walking tests.Land-based resistance training resulted in a statistically significant increase in neurotrophic factors, including BDNF (+13.9%), IGF-1 (+8.2%), and neurotrophins NT-3 and NT-4/5, independent of baseline disability level. Notably, the increase in BDNF was directly correlated with improvements in aerobic capacity (VO2peak) and maximal strength.In aquatic therapy programs, a substantial 20% reduction in overall fatigue was observed (MFIS). Furthermore, the aquatic environment led to significant improvements in both static and dynamic balance (increase of +2.7 points on the Berg Balance Scale). Functional mobility was markedly enhanced, with a 19% increase in walking distance and up to a 29% reduction in the time required to perform daily activities (e.g., sit-to-stand).In conclusion, both combined resistance training and aquatic therapy represent highly effective non-pharmacological interventions for MS. Land-based training enhances the neurotrophic profile, potentially delaying neurodegeneration, while the aquatic environment provides an ideal and safe setting for reducing severe fatigue, restoring balance, and improving functional independence.

Keywords: Multiple Sclerosis, Adapted Physical Activity, Neuroplasticity, Fatigue, Aquatic Therapy

THE EFFECT OF AN INDIVIDUALIZED REHABILITATION PROGRAM ON MUSCLE STRENGTH AND BALANCE IN A PATIENT WITH ACOUSTIC NEUROMA

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An acoustic neuroma (also known as vestibular schwannoma) is a rare benign tumor that develops on the main nerve that connects the ear with the brain. Patients with acoustic neuroma often present with neurological motor deficits such as balance disorders, ataxia and more rarely with hemiparesis. These symptoms significantly impair muscle strength, postural stability and functional independence of the patients. The purpose of the study was to investigate the effect of an individualized rehabilitation program on muscle strength and balance of a patient following acoustic neuroma surgery. A 25-years-old patient, presenting with left-sided dystonia, left hemiparesis, and a spastic gait requiring assistance participated in the study. Clinical signs included a reduced range of motion and muscle weakness in both upper and lower limbs. Assessment was carried out before and immediately after the implementation of a two-month functional rehabilitation program. Muscle strength was evaluated using Medical Research Council (MRC) scale for muscle strength, while balance and functional stability were measured via the Berg Balance Scale (BBS). The intervention consisted of daily two-hour sessions (7 days/week), focusing on mobility exercises, strengthening, trunk stabilization and gait retraining. The program was adapted to the patient's needs and abilities with progressively increasing intensity. Results showed marked improvement in both muscle strength and balance. Specifically, the MRC total score increased from 98/140 to 114/140, indicating enhanced motor recruitment and Berg Balance Scale score improved from 6/56 to 16/56 reflecting a substantial gain in functional balance. In conclusion, these findings indicate that structured, individualized and targeted functional rehabilitation program, may substantially enhance, strength, balance and overall autonomy of patients with post-operative acoustic neuroma.

Keywords: acoustic neuroma, neurorehabilitation, muscle strength, balance

THE EFFECTS OF AN ADAPTED SWIMMING PROGRAM WITH VISUAL PROMPTS ON THE AQUATIC AND EMOTIONAL ADJUSTMENT SKILLS OF CHILDREN WITH ASD AND ID

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Adapted swimming is a key component of physical education, supporting psychomotor, adaptive, and social development, especially for children with Autism Spectrum Disorder (ASD) and Intellectual Disability (ID). When entering the water, these children require time to process multiple sensory stimuli inputs, including temperature, pressure, movement, and sound, that can lead to positive swimming and emotional adjustment outcomes. The purpose of this study was to examine the effect of an adapted swimming program with visual supports on the aquatic and emotional adjustment skills of children with ASD and ID. Thirty children aged 6–15 years (20 with ASD, 10 with ID) were randomly assigned to an experiment group (EG; n = 17) or control group (CG; n = 13). The EG completed a 14-week adapted swimming program (two 60-minute sessions/week) with visual support. The study included pre- and post-assessments including WOTA 1 to evaluate aquatic skills, and the A-SEAS, a newly developed instrument that assesses both aquatic and emotional adjustment skills for children with Autism Spectrum Disorder (ASD) and Intellectual Disability. Non-parametric -Wilcoxon & Mann-Whitney- analyses were used to locate statistically significant differences in skills measured, within each group and between groups respectively. The findings showed that the adapted swimming program produced significant post-intervention improvements in the aquatic (p=.001) and emotional adjustment (p=.001) skills solely for the children with ID and ASD of the experiment group.

Keywords: autism spectrum disorder, intellectual disability, adapted swimming, aquatic skills

THE IMPACT OF PHYSICAL EDUCATION ON STUDENTS WITH AUTISM SPECTRUM DISORDER: A LITERATURE REVIEW

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Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that affects communication, social interaction, behaviour, and often the motor abilities of individuals. Many children with autism present difficulties in motor coordination, balance, as well as sensory processing, which in turn affects their participation in daily and school activities. Physical Education is an important educational context that aims not only at physical development but also at social inclusion, cooperation, and the emotional empowerment of students. The aim of the present study was to investigate the impact of Physical Education on students with ASD through a literature review. Data were collected through a systematic search of databases such as Google Scholar, Scopus, ResearchGate, and Microsoft Academic. The keywords used for the search included “autism”, “physical education”, “special education”, “disability,” and as well as combinations of these terms. The search initially identified 221 studies related to the topic under investigation. Of these, 167 were excluded from further analysis, as 81 were older than ten years, 59 were review studies, and 27 did not include any intervention program. After screening and categorisation of the remaining 54 studies, it was found that Physical Education: (a) contributes to the improvement of gross and fine motor skills as well as body coordination in students with ASD, (b) assists in the regulation of sensory stimuli in these individuals, (c) provides opportunities for cooperation, interaction, and the overall development of social skills, and (d) participation in structured motor activities has been associated with a reduction in repetitive behaviours and anxiety levels in students with autism. In conclusion, Physical Education constitutes a highly important educational tool for children with ASD, as it contributes to their holistic development. Through appropriately adapted activities, individuals with autism can improve their motor skills, increase their social interaction, and develop better sensory regulation.

Keywords: autism,physical education,special education,disability

ΕΜΒΙΟΜΗΧΑΝΙΚΗ
BIOMECHANICS

ACCUTE EFFECT OF STATIC AND CYCLIC STRETCHING ON ANKLE JOINT PASSIVE TORQUE

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The study aimed to compare the acute effect of cyclic and static stretching on ankle joint passive torque in healthy adults. Fourteen men (age 23.5±3.4 years, height 175.5±5.4 cm, weight 80.43±14.78 kg), with no history of left lower limb injuries within the past year, participated voluntarily. All measurements and interventions were performed exclusively on the left lower limb. A randomised crossover design was employed, with participants performing two stretching protocols (static and cyclic) on separate days, with a minimum washout period of 48 hours. Participants positioned in a seated posture on an isokinetic dynamometer (Isoforce 3.1.2), with the knee in full extension and the foot securely fastened to the dynamometer footplate. Assessments were conducted immediately before and after each intervention, consisting of: a) measurement of maximum passive dorsiflexion range of motion (ROM) at an angular velocity of 5°/sec (3 trials) and b) measurement of passive ankle torque at an angular velocity of 5°/sec (3 trials). During ROM assessment, participants used a safety trigger to stop the dynamometer at their pain threshold, defining their maximum tolerance ROM. The static stretching protocol consisted of four 30'' holds, between repetitions the joint moved into plantar flexion and returned to the stretch position at a velocity of 5°/sec. The cyclic stretching protocol involved 20 continious dorsal/plantar flexion cycles. Both protocols were performed at 100% of the individual's maximum dorsiflexion ROM. An isokinetic dynamometer, operating in passive mode was used to record passive torque. Ankle joint angle was caprured using a 10-camera optoelectronic system (Vicon, 100 Hz) and calculated using a custom-made model consisting of 7 markers placed on the studied lower limb. In addition, surface electromyography (sEMG) of the medial gastrocnemius and tibialis anterior muscles confirmed the passive nature of all measurements. Repeated measures ANOVA revealed no statistical significant effects of either the static or the cyclic stretching protocol on ankle joint passive torque ($p>.05$). These results may imply that the total stretching volume or intensity was insufficient to induce immediate changes at passive torque or that such mechanical alterations are temporary and return to baseline rapidly.

Keywords: cyclic stretching, static stretching, passive torque, ankle joint

BIOMECHANICAL COMPARISON BETWEEN HEALTHY AND ANTERIOR CRUCIATE LIGAMENT-DEFICIENT KNEE

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Anterior cruciate ligament (ACL) rupture is the most common ligament injury of the knee. The loss of the ACL affects knee stability and leads to alterations in gait mechanics. These changes are associated with adaptations in both the kinematics and muscle function of the lower limb, aiming to maintain functionality and stability. The purpose of this study was the biomechanical evaluation of gait and the comparison between the injured and healthy lower limb in a female athlete with an ACL rupture without surgical reconstruction. A 25-year-old female volleyball player with a body mass index of 25.2, with a unilateral ACL rupture on the left side eight (8) years post-injury, performed gait at a normal speed in the Biomechanics Laboratory of DPESS-DUTH along a straight walkway. Full-body reflective markers were placed, and 10 gait cycles per side were recorded using a Vicon system with a sampling frequency of 100 Hz, provided that the foot landed entirely on a force plate embedded in the floor, which recorded ground reaction forces at a sampling frequency of 1000 Hz. With the help of musculoskeletal modeling software, joint angles and muscle forces of the lower limbs for each gait cycle and side were calculated through inverse kinematics and static optimization using OpenSim software. Statistical comparison between the two sides throughout the gait cycle was performed using the Statistical Parametric Mapping (SPM) method ($p < 0.05$). The SPM analysis revealed significantly higher activation in the pelvic stabilizers of the injured side during the beginning of the stance phase, specifically in the gluteus maximus ($t_{critical} = 4.274$), gluteus medius ($t_{critical} = 4.073$), and the tensor fasciae latae ($t_{critical} = 4.291$). As expected, the chronic absence of the ACL caused a neuromuscular reorganization different from the healthy limb, with the pelvic stabilizers overworking compensatorily to stabilize the femur and, by extension, the knee. Training athletes without an ACL must take into account these distinct adaptations in muscle activation during movement to create more targeted exercise programs.

Keywords: biomechanics,acl deficient,gait analysis,musculoskeletal modeling,muscle forces

COMPARATIVE BIOMECHANICAL AND MUSCULOSKELETAL ANALYSIS OF THE HEALTHY AND ACL-RECONSTRUCTED LOWER LIMB DURING GAIT

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Anterior cruciate ligament (ACL) rupture is a frequent injury in physically active populations and is commonly associated with long-term functional limitations, altered movement mechanics, and neuromuscular asymmetries, suggesting that lower-limb function is not always fully restored. This study aimed to investigate possible differences between the healthy and ACL-reconstructed lower limb during gait, approximately one year following reconstruction. Specifically, the purpose was to examine side-to-side variations in biomechanical and musculoskeletal parameters during walking. A comparative case study design was adopted. Gait data were collected in a biomechanics laboratory from an individual with unilateral ACL reconstruction during walking trials. Reflective markers were placed on specific anatomical landmarks according to a standardized lower-body biomechanical model. Three-dimensional motion data were recorded using a Vicon motion capture system, while ground reaction force data were obtained using a force plate. The data were processed and analyzed in OpenSim. After scaling the musculoskeletal model to the participant's anthropometric characteristics, joint angles and muscle forces were calculated using static optimization. Comparisons between limbs were performed using Statistical Parametric Mapping (SPM) – paired t-test. Results indicated significant asymmetries in estimated muscle forces between limbs during gait. The ACL-reconstructed limb demonstrated reduced both medial and lateral gastrocnemius force during late stance (tcritical = 4.00 and tcritical = 4.05 respectively), whereas the healthy limb exhibited markedly greater gluteus maximus force (tcritical = 3.97). In contrast, greater force in the reconstructed limb was observed in the iliacus (tcritical = 4.03), suggesting an altered force-sharing strategy and persistent compensatory adaptations during stance. These findings suggest that, one year after ACLR, symmetrical muscle force distribution during gait may not be fully restored, with residual asymmetries likely reflecting persistent compensatory gait strategies despite surgical reconstruction.

Keywords: ACL reconstruction, gait analysis, biomechanics, OpenSim, musculoskeletal modeling, asymmetry

COMPARATIVE STUDY OF THE BIOMECHANICAL PARAMETERS DURING THE ECCENTRIC PHASE OF THE SEMI-SQUAT PERFORMED WITH AND WITHOUT BANDS AS VARIABLE RESISTANCE.

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The aim of the present study was to investigate and compare the biomechanical parameters during the eccentric phase of the back squat when performed with constant resistance (free weights) and with variable resistance using elastic bands. The study focused on the analysis of kinematic and kinetic variables, such as angular velocity, torque, power, vertical ground reaction force, as well as electromyographic activity. Twenty healthy undergraduate male students with resistance training experience participated in the study. They performed back squats under different loading conditions: with free weights, with a combination of free weights and elastic bands emphasizing either the top or the bottom position of the range of motion, as well as under a one-repetition maximum (1RM) condition. Data was collected using force platforms, a motion analysis system, and electromyography. The results showed that the application of variable resistance significantly affects the mechanical parameters of movement. Specifically, the use of elastic bands with emphasis on the bottom position of the squat resulted in higher values of angular velocity and power output, while maintaining similar torque levels compared to the maximum resistance condition. Similarly, the application of bands at the top position appears to favor the maintenance of velocity and power at lower loads, contributing to velocity-oriented adaptations. However, no statistically significant differences were observed in some variables, possibly due to the limited familiarization of the participants with variable resistance. In conclusion, the use of elastic bands as a form of variable resistance in the back squat constitutes an effective training method that can adjust external load according to the mechanical demands of the movement and enhance strength and power development. In particular, their application at the bottom position of the movement appears to be more suitable for programs aiming at maximal strength with an emphasis on movement velocity.

Keywords: half squat, variable resistance, resistance bands, biomechanical analysis

COMPARISON OF INTRA-REPETITION REST AND TRADITIONAL REPETITION CONFIGURATION ON MEAN VELOCITY AND VELOCITY LOSS DURING THE SMITH MACHINE SHOULDER PRESS EXERCISE

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Resistance training is widely used to improve muscle strength, power and neuromuscular performance. The maintenance of movement velocity during resistance training is considered an important indicator of neuromuscular fatigue and training quality. The purpose of the present study was to compare the effects of an intra-repetition rest (IRR) configuration and a traditional (TRD) set configuration on mean movement velocity (MV) and percentage velocity loss (%VL) during the Smith machine shoulder press exercise. Twelve resistance-trained male (n = 12; age: 26.5±6.3 years; mass: 79.8±3.7 kg; height: 179.5±3.5cm) participated in the study. A repeated-measures experimental design was used in which all participants performed both training protocols randomly in separate sessions. Maximum strength (1RM) in the Smith machine shoulder press was first determined, and all experimental trials were performed with a load corresponding to 85% of 1RM. In the IRR protocol participants performed 3 sets of 6 single repetitions with 20 sec rest between repetitions and 140 sec rest between sets. In the traditional protocol participants performed continuous repetitions with 180 sec rest between sets. Mean load velocity and %VL were recorded using a linear position transducer (Chrono Jump linear encoder). Results indicated that IRR configuration maintained higher MV especially during the last three repetitions of sets 2 and 3 ($p < 0.05$). Moreover, %VL was greater after TRD compared to IRR for all sets (set 1: -42.6±12.2% vs. -27.3±14.5%, $p = 0.003$; set 2: -46.8±8.9% vs. -26.7±14.7%, $p = 0.001$; set 3: -50.2±13.4 vs. -27.2±10.2%, $p = 0.001$). These findings suggest that incorporating short rest intervals between repetitions may maintain movement velocity and reduce neuromuscular fatigue during high-intensity upper-body resistance training.

Keywords: Resistance training, Inter-repetition rest, Mean velocity, Velocity loss, Smith machine

DIFFERENCES IN INTERLIMB ASYMMETRY REGARDING THE SINGLE LEG COUNTERMOVENT JUMP KINETICS BETWEEN GREEK FEMALE U18 TRACK AND FIELD SPRINTERS AND THROWERS

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Inter-limb asymmetry in key performance parameters between the lower extremities is suggested to be related to reduced performance, besides being a predisposing factor for injury. Despite the differences in the force application between sprinters and throwers due to the discipline-specific requirements as a result of the biomechanical demands in each discipline, there is no clear evidence for the existence of significant differences regarding the vertical jump kinetics. The aim of this study was to investigate potential differences in interlimb asymmetry with respect to key performance parameters of the single-leg countermovement jump test between female adolescent track and field sprinters and throwers. Twenty-seven female U18 track and field athletes (sprinters: n = 14, age: 15.4 ± 1.1 years, height: 1.66 ± 0.04 m, mass: 55.0 ± 4.6 kg; throwers: n = 13, age: 15.1 ± 1.4 years, height: 1.66 ± 0.05 m, mass: 69.1 ± 12.5 kg) performed three unilateral countermovement vertical jumps in random order regarding the push-off leg. Vertical ground reaction forces were recorded with the K-Deltas dynamometers (Kinvent Biomecanique, Montpellier, France; sampling frequency: 1 kHz) and the kinetic parameters of the best attempt (criterion: jump height) were extracted using the K-Physio v. 2.23.0 application (Kinvent Biomecanique, Montpellier, France). Inter-limb asymmetry was assessed with the symmetry angle. A 2 (leg) x 2 (discipline) ANOVA was run to check the differences using the IBM SPSS Statistics v.29.0.2 software (IBM Corp., Armonk, NY). Results revealed a significant ($p < 0.05$) main effect of discipline in jump height (larger values in sprinters), force parameters, and leg stiffness (larger values in throwers). Furthermore, a significant ($p < 0.05$) inter-limb difference in jump height, average rate of force development, and leg stiffness was observed in the sprinters group. The significant ($p < 0.05$) leg x discipline interaction revealed the different performance pattern in the single-leg countermovent jump between the examined groups. In conclusion, track and field coaches should consider, in addition to the power output demands of the different athletics disciplines, the inter-limb differences and asymmetry in key performance parameters of jumping exercises when designing training programs for adolescent female track and field athletes.

Keywords: Track and Field, sport performance, biomechanical analysis, power, stretch-shortening cycle

GAIT ANALYSIS IN CHILDREN WITH NEURODEVELOPMENTAL DISORDERS: PRESENTATION OF A RESEARCH PROTOCOL

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ABSTRACT Purpose: Clinicians working with children with neurodevelopmental disorders such as Autism Spectrum Disorders (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) have observed differences in these children's gait, such as balance, stability, and other gait parameters. The aim of this study is to investigate the kinematic and spatiotemporal characteristics of gait in children with neurodevelopmental disorders, using the VICON motion capture and analysis method. Methods: The study is being conducted in collaboration with the Department of Psychiatry and Child Psychiatry at the Biomechanics Laboratory of the General University Hospital of Alexandroupolis. The study includes children aged 6 to 18 years with a documented diagnosis of a neurodevelopmental disorder from the General University Hospital of Alexandroupolis. To facilitate the children's participation, a customized familiarization protocol is used via a video presentation of the procedure. Gait recording and analysis are performed using a 10-camera VICON system on a treadmill with integrated force plates. Kinematic and spatiotemporal parameters of gait, such as speed, stride length, symmetry, and variability, are recorded. Results: Data collection is currently in progress and is expected to be completed with a sufficient sample size to draw reliable conclusions. Conclusion: Existing studies, despite their significant contribution, have limited ability to draw reliable conclusions. Therefore, further investigation in the field of motor deficits associated with neurodevelopmental disorders is necessary. The present study is expected to contribute to the understanding of the motor characteristics of children with neurodevelopmental disorders and to support the design of targeted interventions in physical education and rehabilitation.

Keywords: children, gait, neurodevelopmental disorders, gait analysis

RELATIONSHIP BETWEEN THE HAMSTRING-TO-QUADRICEPS STRENGTH RATIO AND KINETIC PERFORMANCE IN SOCCER PLAYERS

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Lower limb muscle power, and particularly the ratio between knee flexors and extensors (H/Q ratio), are decisive factors for athletic performance and injury prevention in soccer. Despite the importance of the H/Q ratio at high angular velocities, the literature regarding the semi-professional level remains incomplete. The purpose of the present study was to investigate the relationship of the Conventional and Functional H/Q ratio with jumping ability, speed, and agility. Simultaneously, potential asymmetries between the dominant and non-dominant limb were examined. Nineteen (19) semi-professional soccer players participated in the research. The performance evaluation in the field included the Standing Broad Jump (SBJ), Countermovement Jump (CMJ), 30-meter sprint, T-test, and the Illinois test (with and without a ball). Muscle strength was evaluated via an isokinetic dynamometer, where the peak torque of the knee extensors and flexors was measured during concentric and eccentric contraction at angular velocities of 60°/s, 180°/s, and 240°/s. Additionally, peak isometric torque was measured at 30° for the flexors and 75° for the extensors. The correlation of the H/Q ratios (concentric/concentric and eccentric/concentric) with the field test results was calculated to determine their impact on the functional performance of the athletes. The results of the study indicate that lower limb muscle power and the balance between knee flexors and extensors (H/Q ratio) are positively related to athletic performance in semi-professional soccer players. Athletes with a higher functional H/Q ratio demonstrated better jumping ability, speed, and agility. Athletes with imbalances showed increased times in agility tests. For reducing the risk of injuries, the balance between the two limbs is equally important, in this specific study, the athletes did not show statistically significant differences. Consequently, the evaluation of the functional H/Q ratio and the eccentric strength of the flexors constitutes a reliable tool for assessing functional capacity and guiding targeted strengthening programs.

Keywords: biceps femoris, muscle asymmetries, football, isokinesis, functional H/Q ratio

THE EFFECT OF EXERCISE OF A STRUCTURED EXERCISE PROGRAM ON GAIT KINEMATIC CHARACTERISTICS IN AN ADULT WITH DRAVET SYNDROME

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THE EFFECT OF EXERCISE OF A STRUCTURED EXERCISE PROGRAM ON GAIT KINEMATIC CHARACTERISTICS IN AN ADULT WITH DRAVET SYNDROME Th. Kostopoulou , Th. Qiorri, E., Karampina , S. Fotiadou, A. Gioftsidou , N. Aggelousis, E. Giannakou 1Democritus University of Thrace, D.P.E.S.S., Komotini, Greece Email: theokost2@phyed.dyth.gr Dravet Syndrome is a rare and severe form of childhood-onset epilepsy characterised by cognitive impairement, motor impairement, balance deficits and muscular weakness. The present study aimed to investigate the effect of a targeted exercise intervention on gait kinematic characteristics. The participant was a 21 years-old male (height: 1.96 m and weight: 80 kg). The intervention consisted of 20 sessions, conducted 3 times per week, with each session lasting 45-60 minutes. The exercise protocol included: a) warm-up (10 min), b) static and dynamic balance, coordination and dual task exercises (20-25 min), c) lower limb strengthening (10-15min) and d) cool-down (5-10 min). The assessment protocol was conducted at baseline, before the implementation of the exercise protocol (pre) and immediately after its completion (post). During each assessment, the participant performed five repeated walking trials at a natural, self-selected speed on a 10m walking track. Reflective markers were attached to the body according to the Conventional Gait Model (CGM) version 2.4. Lower limb kinematic parameters were captured using a 10-camera optoelectronic system (100 Hz). A one-way Statistical Parametric Mapping (SPM) ANOVA was used to identify significant differences in the gait cycle kinematic waveforms, followed by post-hoc t-tests with Bonferroni correction for pairwise comparisons. The SPM analysis revealed significant kinematic modifications in both lower limbs ($p<0.05$). Specifically, differences were observed in bilateral ankle angles and the right hip in all planes of movement, while knee kinematics remained relatively stable. Post-hoc comparisons indicated that the majority of significant improvements occurred between baseline and the final assessment, as well as between pre and post, reflecting the effect of the exercise intervention. The protocol led to significant, multi-planar improvements in gait kinematics, particularly at the hip and ankle joints. These findings suggest that structured, individualised exercise interventions may effectively modulate gait kinematics in young adults with Dravet Syndrome, serving as a potential rehabilitation strategy.

Keywords: Keywords: Dravet syndrome, kinematic parametes, Statistical Parametric Mapping (SPM), exercise

THE EFFECT OF EXERCISE ON SPATIOTEMPORAL GAIT VARIABILITY IN AN INDIVIDUAL WITH SPINOCEREBELLAR ATAXIA: A CASE STUDY

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Spinocerebellar Ataxia (SCA) is a rare, genetic, neurodegenerative disorder characterised by a slowly progressive lack of coordination during gait. The purpose of this study was to evaluate the effect of a structured exercise program on the variability of spatiotemporal gait characteristics in a patient with SCA. A 63 years-old-female (weight: 78 kg; height: 1.65 m) with Spinocerebellar Ataxia Type 5 (SCA 5) voluntarily participated in the study. The assessment protocol involved treadmill gait at a self-selected natural speed on a split-belt instrumented treadmill for 60 sec. Data were collected at three distinct time points: baseline (pre -intervention), immediately following the intervention and at a two month follow-up. Spatiotemporal parameters were captured using a 10-camera optoelectronic system (100 Hz), while gait events were identified via two Bertec force plates (2000 Hz) integrated beneath each treadmill belt. Spatial (e.g. step length, step width) and temporal (e.g. stride duration, double support duration) parameters were analysed. Gait variability was calculated using Coefficient of Variation (CV) for all evaluated parameters. The exercise intervention had a total duration of two months and was conducted at a frequency of three times per week. Each 60 minute session consisted of: a) warm-up (5-10 min), b) static/ dynamic balance and dual task exercises (25 min), c) resistance training (25 min) and d) cool-down (5 min). High – intensity resistance training was exclusively implemented during the first two weeks of the intervention. Baseline results indicated high variability across the majority of the spatiotemporal parameters. Post-intervention, a notable reduction in variability (CV) was observed in several parameters, specifically cadence, step time and stride time for both lower limbs. Conversely, step width variability showed an increase. During the retention phase, most variables that showed post-intervention improvements either maintained or further enhanced their stability. These findings suggest that a multi-modal exercise program may effectively improve gait rhythmicity in individuals with spinocerebellar ataxia type 5.

Keywords: Spinocerebellar Ataxia Type 5, gait variability, spatiotemporal parameters, exercise

TWO DEVICES, ONE MEASURE: RELIABILITY AND AGREEMENT OF DIGITAL HANDGRIP DYNAMOMETERS IN MODERN PENTATHLON ATHLETES

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Handgrip strength is a widely used and practical indicator of upper limb muscular strength in clinical and sports science settings, allowing functional assessment and performance monitoring. Evidence indicates that, although handgrip dynamometers are reliable, they may produce systematically different values. With the increasing availability of devices, agreement between instruments remains important, particularly in athletic populations requiring precise assessment. The aim of this study was to assess the reliability and agreement between two digital handgrip dynamometers. Twelve modern pentathlon athletes from the Greek National Team (17.6±2.3 yrs, 1.70±0.10 m, 61.2±9.2 kg) performed handgrip strength tests (in both left and right hands) using two dynamometers (MAT Hand Grip and Activforce2) (two trials per condition). Intra-session reliability was assessed using the Intraclass Correlation Coefficient (ICC). Comparisons, correlations, and agreement between devices were evaluated using paired-samples t-tests, Pearson correlation coefficients, and Bland–Altman analysis, respectively ($p < 0.05$, SPSS 30.0). Mean handgrip strength values for the MAT and Activforce dynamometers were 34.48 ± 11.09 kg and 27.53 ± 7.76 kg for the right hand, and 33.32 ± 9.58 kg and 25.86 ± 7.83 kg for the left hand, respectively. Significant differences were observed between devices ($p < 0.001$). Both devices demonstrated good to excellent reliability (ICC = 0.887-0.967) and strong correlations ($r = 0.933–0.947$, $p < 0.001$). Bland–Altman analysis revealed systematic bias, with the MAT dynamometer consistently producing higher values than Activforce (mean difference: 6.93 right, 7.46 left; limits of agreement: −2.38 to 16.24 and 0.97 to 13.95). Despite high reliability and strong correlations, the MAT and Activforce dynamometers showed significant systematic bias, indicating that they should not be used interchangeably. These differences may reflect variations in grip geometry and mechanical design, which alter hand biomechanics and influence finger flexion, force distribution, and muscle recruitment during the task. These findings highlight that handgrip strength is device-dependent and should be interpreted with caution, particularly in athletic populations, where accurate and consistent measurements are required for performance monitoring.

Keywords: grip strength, device agreement, athletic population

ΕΠΙΣΤΗΜΕΣ ΤΟΥ ΧΟΡΟΥ

DANCE SCIENCES

DANCE AND DIGITAL DISCOURSE: IDENTITY, AUTHENTICITY AND CULTURAL OWNERSHIP IN YOUTUBE COMMENTS

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The use of social media has shaped new conditions and norms in communication. In this environment, various aspects of folk culture — including folk performing arts — have been involved from the very beginning, constituting material of the internet since its earliest days. At the same time, newer dance ethnographies now extend into online research across electronic platforms and digital environments, with YouTube playing a significant role as a new digital dance archive. Under these conditions, members of YouTube's dance-digital community create content, evaluate, comment and open dialogue, present and seek out the "authentic", while the question arises as to whether users ultimately shape the very notion of authenticity. The present study examined user comments beneath two videos on the official channel of the Cultural Association of Zagori, specifically the video with the most comments — "OSMANTAKAS" (367 comments / 243,691 views) — and the video with the most views — "Dances of Karystos: KAVONDORITIKOS" (237 comments / 1,537,315 views). The comments were analyzed using the method of critical discourse analysis in order to identify the thematic threads that constitute participants' discourse, as well as their points of convergence and divergence. The theme that dominates in both videos is national, local and ethnic identity and belonging. However, apart from this significant convergence, differences are found in the two videos. The first concerns ethnic claiming and cultural appropriation, which appears far more prominently in the case of Osmantakas than in the Kavondoritikos. The second significant difference relates to authenticity and criticism of performance, which features strongly in the Kavondoritikos. Finally, a third tendency concerns historical argumentation, which is found almost exclusively in the Osmantakas. From the first level of comment analysis, it appears that folk culture — and dance in particular — within new digital environments constitutes a field in which questions of identity, cultural ownership and authenticity emerge, and that in combination with the ever-increasing use of modern technologies and digital media, this creates new challenges for scholars of the dance phenomenon.

Keywords: traditional dance, folk culture, digital ethnography, YouTube, critical discourse analysis, digital environments, social media

DANCE, PERFORMATIVITY AND INVENTED TRADITION: THE FORMATION OF THE CARNIVAL EVENT "GRIITSA GATHERING" IN MENDENITSA, PHTHIOTIS.

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The present study examines the formation of a contemporary carnival event in Mendenitsa, Phthiotis, through the lens of invented tradition. The event "Griitsa Gathering" constitutes a recent cultural initiative of the local community, structured around a local myth and embedded within broader processes of cultural action and promotion. The aim of the study is to investigate the processes through which the carnival event is formed and to examine the role of dance performance in shaping local cultural identity, focusing on how what is perceived as "tradition" is constructed and re-signified in the present. The research was based on an ethnographic approach. Data were collected through participant observation and semi-structured interviews with members of the local community and participants involved in the organization of the event. The interpretation of the data was grounded in the concept of invented tradition, as introduced by Hobsbawm, in conjunction with theories of performativity and ritual action.The analysis of the data revealed that the event is structured through the selection and reconstruction of elements presented as "traditional," such as the procession of masked figures and bell carriers, the dramaturgical appearance of the figure of Griitsa, and the ritual lighting of the fire. The process culminates in a collective dance celebration in which the community participates in traditional dances. The findings indicate that the event does not constitute a simple revival of a pre-existing tradition, but rather a contemporary cultural performance through which the community constructs and re-signifies tradition in the present. Dance performance functions as a key mechanism in this process, contributing to the formation of collective experiences and the representation of local cultural identity. Furthermore, the findings highlight the active role of the community in negotiating and legitimizing what is perceived as tradition through collective participation and performative practices. The event operates as a dynamic cultural framework in which meanings are continuously reshaped, reflecting both continuity and transformation within the local cultural context.

Keywords: Dance, performativity, invented tradition, carnival event, ethnography.

DANCE, PROCESSION AND RITUAL PERFORMANCE IN THE CUSTOM OF SAINT GEORGE IN NESTANI, ARCADIA

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Customary ritual events constitute important forms of cultural expression through which local communities organize and reproduce collective practices and forms of social cohesion. In Greece, many of these events are associated with religious celebrations and are structured around complex ritual actions. Within this context, the custom of Saint George in Nestani, Arcadia, which takes place on the feast day of Saint George, is situated. Although the custom has been recorded in the relevant literature, its structure as a dance event and the way in which musical and dance practices organize the collective performance of the ritual have not been investigated. The aim of the study is to explore the structure of the customary event of Saint George in Nestani, with emphasis on the ritual dance procession and on the way in which dance, singing and the movement of participants shape the collective performance of the custom. The study was based on a qualitative ethnographic approach. Data collection was conducted through on-site participant observation during the custom, interviews with participants and members of the local community, as well as analysis of relevant literature. The interpretation of the data was carried out within the framework of the anthropological approach to ritual proposed by Victor Turner (1969) and the anthropology of dance developed by Adrienne Kaeppler (1999). The customary event includes the ascent of the participants to the rock of Goulas, the formation of dance and singing without the accompaniment of musical instruments, and the realization of a procession that ends in the central square of the village. Dance appears at every stage of the ritual process, marking both the beginning and the transitions between the different phases of the event. At the same time, through the formation of dance circles, the collective participation of the members of the community is organized.The customary event of Saint George in Nestani can be approached as a ritual dance performance. The study highlights the role of dance as a key element in the formation and experiential transmission of local cultural practices.

Keywords: Dance, cultural expression

FROM SEPERATION TO INCORPORATION: RITUAL STRUCTURES IN LIVANATEIKO KAGKELI

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This study examines the Livanateiko Kagkeli dance within the context of the wedding ceremony, which constitutes one of the post significant social events for the community of Livanates. The aim of this study is to analyze the Livanateiko Kagkeli as a rite of passage within the framework of wedding customs. It explores how it functions as a symbolic mechanism for the transformation of the couple's social identity and contributes to their social integration within the community. For the collection of data, an ethnographic approach was adopted, as applied in dance studies. The documentation of the dance form was carried out using the Labanotation system of human movement notation, while the structural analysis was based on the structural-morphological and typological method of analysis. The interpretation of the data was grounded in the theoretical framework of "rites de passage", as formulated by Arnold van Gennep. According to this theory, rites of passage are divided into three stages: separation, transition and incorporation. The analysis demonstrated that the Livanateiko Kagkeli ultimately incorporates characteristics of all three of these phases. Specifically, in the stage of separation, the dance appears in the form of a procession ("patinada"), contributing to the transition of the couple from the private to the public sphere. In the stage of transition, it emerges as a central element in preparation of the couple, functioning as a symbolic mechanism of change in social status. Finally, in the stage of incorporation, the dance constitutes the couple's first shared dance, through which their new identity becomes visible and socially accepted. Overall, Livanateiko Kagkeli is highlighted as a multidimensional cultural phenomenon that transcends the character of a simple festive element. Instead, it functions as a crucial ritual mechanism that contributes to the maintenance of social cohesion as well as the cultural continuity of the community.

Keywords: dance, ritual, wedding ceremony, Rites of passage, ethnography, Livanateiko Kagkeli, cultural identity

GENDER, DANCE AND RITUAL IN THE CELEBRATION OF MAY DAY: WOMEN'S ROLE IN A LOCAL CUSTOMARY PRACTICE

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The celebration of May Day constitutes a customary practice associated with notions of renewal, transition and collective expression, while being structured through specific social practices that activate community participation in public space. Within this framework, the performative actions developed during the celebration, such as flower gathering, wreath-making and participation in dance activities in which singing plays a significant role, are associated with distinct roles and forms of participation related to gender. The aim of the study is to investigate the role of women in the formation of the May Day customary practice and to examine how dance performance is connected to the formation and negotiation of gender identities. The research was based on a qualitative ethnographic approach. Data were collected through field observation of the celebration and semi-structured interviews with female participants. The interpretation of the data was grounded in approaches to performativity and ritual action, as developed by Victor Turner and Richard Schechner, as well as in theoretical perspectives, such as that of Judith Butler, which conceptualize gender as a socially and culturally constructed practice. The findings indicate that women play a central role in the formation of the celebration, primarily through flower gathering, wreath-making and the initial activation of the ritual process. This is followed by the gathering in the public space of the village square, where participation in music and dance activities reinforces the collective dimension of the celebration. Dance, in forms such as syrtos and tsamiko, functions as a key axis of collective participation and embodied expression.The conclusions highlight that the May Day customary practice operates as a field through which gender identities are constructed, expressed and negotiated. The transition from women's preparatory activities to their presence in the public space of collective performance indicates a dynamic relationship between gender, the body and public visibility, underscoring the active role of performance in the formation of social identities.

Keywords: gender, dance, ritual, ethnography, May Day

GREEK TRADITIONAL DANCE IN COMPETITIVE CONTEXTS: ISSUES OF REPRESENTATION AND EVALUATION

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This study examines the representation and evaluation of Greek traditional dance within competitive frameworks in the Greek-American diaspora, focusing on the Hellenic Dance Festival (HDF). Greek traditional dance constitutes a fundamental element of cultural identity and collective memory. However, its transfer from a community context to staged and competitive environments introduces new dynamics that affect both its form and meaning. The aim of this study is to analyze how the concept of "authenticity" is constructed, negotiated, and evaluated within competitive cultural contexts, as well as to highlight the role of the actors involved in its formation. Within this framework, the research focuses on a specific ethnographic case in which two dance groups presented the same local dance repertoire in a diaspora competition, revealing different approaches in terms of dance execution, musical accompaniment, costume representation, and the staging of tradition. The study adopts a qualitative ethnographic approach, combining participant and systematic observation, audiovisual analysis, literature review, and reflexivity. The dual role of the researcher, as both participant and observer, enabled an in-depth understanding of the processes through which dance is taught, staged, and evaluated. Data analysis was conducted using a comparative method, contrasting performed practices with ethnographic documentation. The findings reveal a strong tension between "authenticity" and stage effectiveness. Despite deviations from historical and cultural accuracy, more theatrical and visually impressive approaches appear to be favored in evaluation, suggesting that judging criteria tend to prioritize spectacle over ethnographic fidelity. At the same time, issues related to the composition and role of judging panels are highlighted, including lack of specialized knowledge and subjectivity in evaluation. In conclusion, competitive dance festivals in the diaspora function as dynamic fields where tradition is not merely preserved but transformed and renegotiated. The study underscores the need for clearer evaluation criteria and stronger connections between academic research and cultural practice in order to safeguard intangible cultural heritage.

Keywords: Greek traditional dance, diaspora, performance, competitive festivals, intangible cultural heritage.

NEGOTIATING THE SACRED AND THE SECULAR: THE DANCE "LIVANATEIKO KAGKELI" IN LIVANATES, FTHIOTIDA

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This study examines the most characteristic dance of the community of Livanates in Fthiotida, the Livanateiko Kagkeli, focusing on its variations in relation to the ritual and social context in which it is performed. The aim is to investigate how the dance is transformed and presented in two distinct contexts: at weddings and at the festival of Saints Theodore within the community. Data collection followed an ethnographic approach, as applied in dance studies. The documentation of the material was carried out through the Labanotation system, while the analysis employed a structural, morphological, and typological method. The interpretive approach was based on the theoretical distinction between the "sacred" and the "secular," as developed in Leach's theory. The findings show that, although the basic choreographic form of the dance remains consistent, across both contexts, differences appear in specific structural elements related to the social purposes each context serves. These differences are particularly evident in the dance formation and in the positioning of participants within the dance circle. Thus, while the form of the dance is relatively stable, its meaning and function vary depending on the performance context. In the context of weddings, the Kagkeli is closely associated with ritual processes, social transitions, and elements of the sacred. In contrast, the festival, although rooted in religious celebration, places greater emphasis on entertainment and communal gathering, incorporating elements of the secular. The festival of Saints Theodore appears to occupy an intermediate position between these two spheres, combining characteristics of both. Furthermore, the study highlights the dynamic relationship between dance, society, and culture, as well as the ability of dance to function as a medium of transition between cultural contexts. The results indicate that a network of dance performances is formed depending on the specific context, while the distinction between "sacred" and "secular" does not constitute a fixed or clearly defined category. Instead, meaning and performance context, emerge as products of social negotiation, shaped by community members according to their needs and objectives.

Keywords: dance, ritual, festival, sacred/secular, social performance context, Livanateiko Kagkeli

NEURODANCE IN GREECE: INITIAL EVALUATION OF A DANCE INTERVENTION FOR PARKINSON'S DISEASE

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Parkinson's Disease (PD) is a progressive neurodegenerative disorder affecting motor and non-motor functions, including emotional well-being and quality of life. NeuroDance is an international project funded by EU (Erasmus sport – cooperation partnerships) aiming to improve symptoms and promote well-being through adapted dance interventions. The 5-month dance intervention of the project includes various dances (Polka, Greek folk dance, Polka, Tanco, Country), adapted for people with reduced mobility. In Greece, six PD patients (aged 70–75) participated along with their caregivers and completed the first cycle of the project's intervention. Data were collected through structured personal interviews following the intervention. All participants identified social interaction as the most beneficial component (n=6), while the complexity of steps was reported as the main difficulty (n=4). Preferred dances were Greek traditional dances (n=3) and polka (n=3). The most significant perceived changes were improved social connection (n=5) and elevated mood (n=3). Self-reported improvements were observed across multiple domains including motor function (gross motor skills n=5, balance while standing n=5, balance during walking n=4), flexibility (n=6), fatigue (n=5), motivation (n=6), mood (n=6), and social engagement (n=5). Pain showed minimal change (4 no change, 1 moderate improvement), whilec confidence in movement showed mixed responses (2 moderate, 2 high, 2 no change). Attention showed limited improvement (2 moderate, 1 high, 3 no change), while sleep quality and quality of life showed moderate improvements in a subset of participants. Main barriers for participation included transportation (n=6), complexity of steps (n=4), fear of falling (n=3), and fast tempo (n=3). All participants (n=6) would strongly recommend the program and suggested increasing session frequency. In conclusion, NeuroDance appears to be a feasible and beneficial intervention for individuals with PD, particularly enhancing social interaction, mood, and motivation. Adjustments in accessibility and task complexity may further optimize outcomes.

Keywords: Parkinson's disease, Physical activity, Dance intervention, Quality of life, Social interaction

SOCIAL HIERARCHY IN GREEK TRADITIONAL DANCE: THE CASE OF CHRISSO FOKIDAS

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Dancing in the 21st century may seem a random and spontaneously choice of the moment while everyone can join in the circle of the dance without thinking about social structure and order. However, when dancing is performed in a specific context or ritual its symbolic character may be more important than the actual dance moves (Giurchescu, 2001). Given that, the order of the dancers in a dance circle may have a deeper social meaning than it seems. As Weber (1946) argues, a particular way of life is expected of everyone who aspires to be a part of the community's social life. Thus, social structure requires specific practices and representations of social act (Bourdieu, 1990). A typical example of social hierarchy in everyday life appeared in specific dancing events related to religion in an agricultural Greek community, Chrisso, in Fokida in Central Greece. The aim of the study is to investigate whether social hierarchy is depicted in villagers' dance. The study conducted under the principles of ethnography method, as it is applied in the science of dance. The data collection derived from primary sources (14 semi-structured interviews from inhabitants) and secondary sources. The analysis and the interpretation of the data was based on Bourdieu's (1990) theoretical scheme of habitus, which generates personal and social practices within the limits of each regularity, and on Giurchescu's (2001) view of the sociopolitical power of dance and its symbolic character. From the data analysis appeared that community's social hierarchy subconsciously depicted in dancers' dance order and especially established the dominant role that the priest held in villagers' mind. Even thought this social order used to take place few decades ago, still in synchrony the priest is invited by the villagers to dance first. It seems that the order in dance is a practice that reproduces the social reality of the community which applies in Bourdieu's (1990) view that prior norms are actively present and maintain their constancy throughout time.

Keywords: social hierarchy, greek traditional dance, Chrisso, social order

STUDY OF THREE CHOREOGRAPHIES DURING A CENTURY FROM 1913-2013, OF THE WORK "THE RITE OF SPRING" (I.STRAVINSKY), CHOREOGRAPHED BY THE DISTINGUISHED CHOREOGRAPHERS V.NIJINSKY, P.BAUSCH, S.WALTZ

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This study focuses on three choreographies based on Stravinsky's music "The Rite of Spring" choreographed by Vaslav Nijinsky, Pina Bausch and Sasha Waltz. The aim of the research was the exploration of the artistic as well as the choreographical approach of "The Rite of Spring" through comparative analysis of the choreographies ,in order to identify the similarities and differences concerning the choreographical interpretation of the same iconic musical work. A century of dancing developmental progress (1913-2013) is depicted throughout the three choreographies, from the transition from ballet to contemporary dance, and each of them represents the choreographical trends emerging during each era they were created.For the needs of the research, the three choreographies were analyzed and evaluatedthrough the Smith methodological framework of analysis of dance performances. The particular research tool is a structured analytical means utilized in performing arts,which focuses on examining the basic elements of movement, the structural and morphological qualities, as well as the aesthetics criteria of a choreography.The above process leads to a deeper analysis and critical assessment of the choreographies mentioned. The main findings of the research show differences concerning mainly the interpretation of the theme, as well as the structural elements, such as the space, the choreography and the movement vocabulary. Additionally, there were some differences in scenography detected. However, research indicated that the three choreographies share some similarities as well, regarding mainly the close interaction between the music elements and the choreographical approach as well as the ritualistic nature of the choreography. Furthermore, an additional essential similarity observed in all three choreographies was the repetition of movement phrases which were based on the repetition of music phrases that characterize the musical morphology of Stravinsky's work.

Keywords: Ritual, Rite, Dance Theatre , Dance

THE DIETARY HABITS AND PERCEPTIONS OF DANCE STUDENTS IN DEVELOPING AGES IN RELATION TO THEIR DANCE ACTIVITY

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Dance constitutes a demanding physical activity, combining artistic expression with high physical performance requirements. During developmental stages, adequate and balanced nutrition is a major factor contributing to proper development, injury prevention, and performance enhancement. However, social and aesthetic factors often affect the dietary behavior of children and adolescents, increasing the risk of restrictive practices. The aim of the present study was to investigate the dietary behaviors and perceptions of dance students in relation to their dance activity. A total of 118 children and adolescents (102 females and 16 males), who regularly attended various types of dance classes (e.g., classical ballet, contemporary, traditional, latin, hip-hop), voluntarily and anonymously participated in the study with parental consent. Participants were categorized into three age groups: 4–8 (n=26), 9–12 (n=43), and 13–18 (n=49) years old. The study was conducted using a structured online questionnaire, including demographic data, questions on dietary habits and perceptions regarding the relationship between nutrition and dance performance. For the younger participants, the questionnaire was completed by parents/guardians. The results indicated that younger children demonstrated a stronger orientation toward healthy eating habits compared to adolescents. Specifically, advancing age was associated with a decreased frequency of breakfast consumption and regular meals, reduced daily consumption of fruits and vegetables, and a higher tendency to select meat as the main meal. In contrast, the consumption of legumes and fast food remained steady on a weekly basis across all age groups. In terms of the perceptions of nutrition and dance activity, participants across all age groups acknowledged that diet influences performance and sense of fatigue during training, as meals are often skipped prior to dance classes. Furthermore, with advancing age, there was a growing concern about body weight and dance performance, frequently accompanied by restrictive nutritional intake. Overall, the above findings demonstrate the critical role of parental intervention in dietary habits during early childhood. However, during the transition to adolescence, this intervention diminishes, while the impact of social media increases, shaping eating habits that do not necessarily prioritize adolescents' health.

Keywords: dietary habits,dance students,nutritional knowledge,physical fatigue,dance performance

THE IMPACT OF DANCE THERAPY ON MOTOR AND NON – MOTOR SYMPTOMS TO PEOPLE WITH PARKINSON'S DISEASE

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Parkison's disease is a neurological condition and is characterized by multiple motor and sensorimotor symptoms including rigidity, tremor and disturbances in gait and balance, as well as slower and reduced amplitude movements. It is also characterized by non – motor symptoms including cognitive, emotional and behavioral problems, pain and automatic dysfunction. The aim of this review study is to evaluate the impact of dance therapy in motor and non – motor symptoms on people with Parkison. For this purpose, it was used scientific database, PubMed, with 10 articles between the years of 2021 to 2026. Most of the studies concluded a dance program 2 to 3 times per week, within 30 to 90 minutes, for at least 8 to 12 weeks. The individuals danced various types of dancing like tango, Irish dance, folk dance, Qi – dance, Brazilian dance, to name but a few. The indicators being used as evaluation criteria are: motor scale (MDS – UPDRS 3), balance (Mini – BEST), Timed Up and Go Test, 6 min Walk Test, FOG – Q, well – being (PDQ – 39), as well questionnaires for depression / stress. The results of the participation in the prementioned dances proved to improve the motor symptoms, the balance and the freezing gait. However, as depends on the well – being, the depression and the stress there was no significant improvement. To sum up, the conclusion of this study is that dance can offer a significant improvement on motor and non – motor symptoms, as it is effecting the movements, the balance, the freezing gait and the psychological – emotional subsistence. That's why it is recommended the dance therapy be integrated as supplementary therapy into a rehabilitation program.

Keywords: dance therapy,Parkinson disease,Parkinson

THE ROLE OF DANCE IN TRANSFORMING DELINQUENT BEHAVIOUR AT SCHOOL AGE

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Delinquency in school age should not be approached solely as a deviation from rules, but as an expression of a deeper difficulty of the child to coexist, to organise their behaviour and to find their place in a collective environment. The present study examines the phenomenon in relation to processes of socialisation and the conditions under which the child shapes their relationship with others. In Piaget's developmental framework, school age from 6/7 to 11/12 years is recognised as a crucial period for the development and consolidation of social-emotional skills such as self-regulation, understanding and adherence to rules, cooperation and social integration, skills that are directly related to the transformation of deviant behaviour. The aim of this literature review was to investigate the contribution of dance as a pedagogical tool in transforming delinquent behaviour at this specific developmental stage. The study is based on Greek, English, Italian and Spanish literature, including books, scientific articles, conference proceedings and doctoral dissertations published between 2010 and 2025. The material was collected through a systematic search of digital and printed sources using keywords. Google Scholar, ResearchGate and the National Archive of Doctoral Dissertations were used, allowing the phenomenon to be approached from multiple scientific perspectives at conceptual, developmental, sociological and pedagogical levels. As emerges from the literature, dance does not introduce something new, foreign or unfamiliar, but reveals a hidden dimension of the child's nature which preexists and manifests naturally and spontaneously as a means of expression and communication before the development of verbal language. The findings show that the systematic integration of dance into the school environment can significantly enhance the development of social-emotional skills and contribute constructively to transforming delinquent behaviour. More specifically, through rhythmic and collective dance movement, the child learns to coordinate with others, to understand and respect boundaries and to participate actively in shared activities, making use of the possibilities offered by their developmental stage. Therefore, the integration of dance in the school environment does not constitute a supplementary activity, but a meaningful pedagogical choice with practical applicability.

Keywords: school age, child delinquency, deviant behaviour, behaviour management, transformation of delinquent behaviour, dance in education, dance and delinquency, social-emotional skills

WHEN THE RESEARCHER RETURNS TO THE FIELD: DANCE, MEMORY, AND CULTURAL TRANSFORMATION IN NEA VYSSA, EVROS

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The study of dance, as a cultural practice, highlights its close relationship with the construction of local identity. Within this framework, the researcher's return to the same ethnographic field after a significant period of time, offers the opportunity to understand the mechanisms of continuity and transformation of cultural phenomena. The aim of this study is to investigate the role of dance in the preservation and renegotiation of cultural memory in Nea Vyssa, Evros, as well as to reflect upon the researcher's position through the process of revisiting the same field after two decades. The research is based on a qualitative ethnographic approach and a comparative analysis of data from two phases of fieldwork (2005 and 2025). Data collection was conducted through participant observation, during the performance of the local dance event of Bey, semi-structured interviews with community members of different generations and levels of involvement, as well as the recording and documentation of dance practices and related narratives. The interpretation of the data was grounded in an interpretive ethnographic approach, drawing on Geertz's concept of "thick description". At the same time, the concept of performance was employed to approach dance as a dynamic social practice, while the reflexive dimension of the research was used to highlight the role of the researcher as an active subject in the production of knowledge. The analysis of data reveals a shift of the dance event from a symbol of micro-local differentiation to a symbol of collective unity, reflecting broader social and cultural transformations. At the same time, the active role of the community in the re-signification of dance is highlighted, while the researcher's return to the field reveals shifts both in the field itself and in the ethnographic perspective. In conclusion, dance emerges as a dynamic mechanism for the formation of cultural memory, while the return to the field underscores the importance of temporality and reflexivity in ethnographic research. Ultimately, the study contributes to a deeper understanding of the relationship between ethnographic research and lived experience, highlighting the significance of revisiting the field as a tool for deeper interpretation.

Keywords: Dance event, collective memory, cultural identity, comparative ethnography, reflexive ethnography.

ΑΣΚΗΣΗ ΚΑΙ ΜΥΟΣΚΕΛΕΤΙΚΕΣ ΚΑΚΩΣΕΙΣ & ΠΑΘΗΣΕΙΣ

EXERCISE & MUSCULOSKELETAL DISEASES

MOST EFFECTIVE MODES OF EXERCISE TRAINING FOR TREATING LOW BACK PAIN

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Low back pain is one of the leading causes of disability worldwide. In most cases, no clear diagnosis is identified, so it is classified as non-specific chronic low back pain (NSCLBP). Physical exercise is considered an effective treatment, but it remains unclear which form is optimal. The aim of this study was to compare the effectiveness of different modes of exercise in treating non-specific chronic low back pain and their effects on physical function, mental health and muscle strength, including comparisons with non-exercise interventions. The study was designed as a systematic review and network meta-analysis, which allows for both direct and indirect comparisons. A total of 89 studies were included, with a total sample of 5,578 patients. Sample sizes ranged from 20 to 240 patients of both genders, with a mean age of 20–70 years, a pain duration of 12–725 weeks, and a pain intensity of 21–79 units (on a 0–100 scale). Among the 89 studies, a total of 131 exercise interventions were implemented (n=3,924), including resistance training, stabilization and motor control exercises, Pilates, yoga, McKenzie techniques, aerobic exercise, aquatic exercise and stretching (1–7 sessions/week). In addition, 59 non-exercise interventions (n=1654) were conducted, including manual therapy, chiropractic care, massage, thermotherapy or cryotherapy, as well as psychological interventions, with frequencies ranging from 0.3 to 5 sessions per week. The results indicated that Pilates was the most effective for reducing pain. Stabilization exercises and resistance training demonstrated the greatest improvements in physical function, while aerobic training and resistance training were associated with positive effects on mental health compared with other interventions. In contrast, stretching and McKenzie techniques did not show significant benefits compared with no intervention. In conclusion, active exercise-based interventions appeared more effective than passive treatments in reducing pain and improving functional capacity. However, the quality of the evidence was low, and there was significant heterogeneity among the studies, which limits the generalizability of the results.

Keywords: low back pain, non-specific chronic low back pain, network meta-analysis, exercise therapy, rehabilitation, Pilates

THE EFFECT OF PILATES MAT PROGRAM ON CHRONIC LOW BACK PAIN AND ON THE PSYCHOLOGICAL MOOD ON ADULTS

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Chronic low back pain is one of the most common musculoskeletal disorders, significantly affecting functionality and quality of life. The present study examined the effects of a 10-week Pilates MAT program on pain intensity and psychological mood. Eight adults (25–65 years old) participated in three sessions weekly. Psychological status was assessed using the Emotions Scale (MPENEKA et al., 2010) before and after the intervention. Results showed a 43% reduction in pain intensity (from 2.9/5 to 1.6/5). Negative emotions significantly decreased, while positive emotions increased. Findings suggest that Pilates MAT can be an effective non-pharmacological intervention for chronic low back pain and enhancing psychological well-being.

Keywords: chronic low back pain, lumbar spine, Pilates MAT, psychological health, rehabilitation, exercise

THE EFFECT OF HYDROTHERAPY ON PATIENTS WITH MULTIPLE SCLEROSIS. TRAINING APPLICATIONS FOR SAFER PARTICIPATION. A NARRATIVE REVIEW

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Multiple Sclerosis (MS) is a chronic, inflammatory, and autoimmune disease of the central nervous system (CNS) that leads to demyelination and neurodegeneration. The therapeutic approach consists of disease-modifying therapies and symptomatic treatments. Previously, doctors did not advise people diagnosed to participate in physical activities; however, this perception has gradually changed as evidence supporting the benefits of exercise has increased. Exercise is now being proposed as an effective non-pharmacological strategy to improve the physical and mental health of patients. This narrative review aims to investigate the effect of hydrotherapy in patients with MS. Electronic databases PubMed, Web of Science, and Google Scholar were utilized to identify relevant studies. Research findings indicate that hydrotherapy improves balance, mobility, and muscle strength, while also reducing pain, fatigue, and spasticity. Moreover, the buoyancy and thermal properties of water provide a supportive and safe environment that facilitates movement, decreases joint stress, and minimizes the risk of falls and injury. Participation in aquatic exercise programs may also enhance psychological well-being by reducing anxiety, improving mood, and promoting social interaction among participants. In conclusion, appropriately designed hydrotherapy programs can serve as an important adjunctive treatment alongside medication, contributing to improved functional capacity and overall quality of life for individuals with MS.

Keywords: inflammation, treatment, quality of life, physiological responses, hydrotherapy

THE IMPACT OF SPEED ON INJURY OCCURRENCE DURING ELITE SOCCER MATCHES

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The increased frequency of injuries in football is not accidental; it is directly related to the demands of the sport itself. As the most popular sport in the world, soccer is characterized by an intense pace and the constant alternation of movements, such as sudden changes of direction and rapid acceleration or deceleration. The purpose of this research was to examine the relationship between a player's speed and the occurrence of injuries during a match. The sample consisted of 35 injuries from high-level men's soccer matches involving players who left the field immediately following the incident. The variables analyzed were: a) speed and b) type of injury. Observations were made using SportScout software, and data analysis was conducted using non-parametric crosstabulation. The results showed that out of the 35 total injuries, 21 occurred during sprinting—11 of which followed a ground duel. Additionally, of the 12 injuries that occurred during running, the majority followed ground duels (4) or sudden changes of direction (3). Consequently, it can be concluded that in high-level competition, the combination of opponent intervention (dueling) and sprinting (maximum speed) appears to be the most dangerous mechanism for serious knee injuries, highlighting the need for stability training under sprinting conditions

Keywords: High-Level Soccer, Sports Injuries, Video Analysis

ΕΡΓΟΦΥΣΙΟΛΟΓΙΑ-ΚΛΙΝΙΚΗ ΕΡΓΟΦΥΣΙΟΛΟΓΙΑ

EXERCISE PHYSIOLOGY-CLINICAL EXERCISE PHYSIOLOGY

ACUTE EFFECTS OF DIFFERENT EXERCISE PROGRAMS ON BLOOD PRESSURE AND HEART RATE IN POSTMENOPAUSAL WOMEN

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Postmenopausal women exhibit an increased cardiovascular risk, as the hormonal changes that accompany menopause, particularly the decline in estrogen levels, are associated with alterations in cardiovascular function. These alterations include impaired blood pressure regulation, tachycardia and deterioration of vascular function. Systematic physical activity is recognized as an important non-pharmacological factor for the improvement of cardiovascular indicators. This study aimed to investigate the acute effects of Reformer Pilates, Mat Pilates, and Circuit Training on systolic and diastolic blood pressure and heart rate in women in the postmenopausal period. Twelve postmenopausal women with at least twelve months of amenorrhea, a mean age of 57.0 ± 5.35 years and a mean time of 5.63 ± 4.62 years since menopause onset participated in the study. All participants completed the three exercise protocols. Each exercise session lasted sixty minutes and was performed at moderate intensity. The exercise programs were designed to activate the abdominal muscles and core stabilizers, enhance lower limb strength and pelvic stability, improve balance, promote hip and spinal mobility, and ensure safety while addressing the specific physiological needs of postmenopausal women. Blood pressure and heart rate were assessed at the beginning and at the end of each exercise program using a validated digital blood pressure monitor MicroLife BP B3 Afib. Statistical analysis demonstrated a significant reduction in systolic blood pressure (p 0.05). Heart rate increased significantly ($p < 0.05$) across all exercise conditions. The results demonstrated that exercise, regardless of type, induced a significant reduction in systolic blood pressure, indicating beneficial cardiovascular adaptations and the occurrence of post-exercise hypotension. Heart rate increased significantly, reflecting the normal physiological response to exercise. Overall, these findings support the beneficial role of moderate-intensity exercise in improving cardiovascular function in postmenopausal women.

Keywords: Menopause, Mat Pilates, Reformer Pilates, Circuit Training, Cardiovascular indicators

ACUTE PHYSIOLOGICAL RESPONSES TO DIFFERENT SEQUENCES OF EXERCISE PROTOCOLS IN HEALTHY ADULTS

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Concurrent exercise programs combining resistance training (RT), moderate-intensity continuous training (MICT), and high-intensity interval training (HIIT) have gained increasing research attention due to their effectiveness in enhancing cardiovascular and metabolic outcomes within limited time. However, acute physiological responses to different exercise modality sequences remain insufficiently explored. This study aimed to examine acute physiological responses to three distinct sequences of concurrent exercise in healthy adults. Fifteen adults (n=15; 3 men, 12 women; age 45.12±10.73 years; height 168.80±6.31 cm; body mass 68.43±12.48 kg; body fat 22.32±6.78%; BMI 23.91±3.25 kg/m²) participated voluntarily. Participants completed three different exercise sequence protocols, with a one-week washout period between sessions: (1) RT–MICT–HIIT, (2) HIIT–RT–MICT, and (3) MICT–HIIT–RT. Body composition, water consumption, energy expenditure, body temperature, heart rate, arterial blood pressure, and blood lactate were measured before and after exercise, while heart rate was continuously monitored. Perceived exertion was assessed using the Borg 6–20 scale. Internal training load was quantified via Training Impulse (TRIMP) and session Rating of Perceived Exertion (sRPE). Results demonstrated significant effects of exercise sequence on heart rate ($p<0.001$), blood lactate ($p<0.001$), and TRIMP ($p<0.001$), with the MICT–HIIT–RT protocol eliciting the highest internal load. No significant differences were observed in systolic or diastolic blood pressure ($p>0.05$), water consumption ($p>0.05$), energy expenditure ($p>0.05$) or sRPE ($p>0.05$) between protocols, indicating similar perceived exertion regardless of sequence. In conclusion, the order of exercise modalities affects objectively measured internal physiological load but does not alter subjective perception of exertion or energy expenditure. These findings highlight the importance of sequencing within concurrent training programs to optimize acute training responses, particularly in time-constrained gym-based settings.

Keywords: resistance training, HIIT, MICT, TRIMP, sRPE, internal load, physiological responses

APPLICATION OF AN EXERCISE PROTOCOL IN A PATIENT WITH CHRONIC LOW BACK PAIN

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Chronic non-specific low back pain is one of the most prevalent conditions worldwide, significantly affecting functional capacity and daily activities. People with chronic low back pain often experience difficulties and limitations in their everyday functioning. The aim of this case study was to investigate the effect of an intervention consisting of 2 stages, hydrotherapy and land-based exercises, in an individual with chronic low back pain. The sample consisted of a 63-year-old woman with a 7-month history of chronic non-specific low back pain who had not participated in any structured exercise program during the past year. The assessment included four domains: pain intensity, anthropometric characteristics, trunk muscle strength, and balance. The rehabilitation program lasted 6 weeks and included 9 hydrotherapy sessions during the first 3 weeks and 9 land-based exercise sessions during the following 3 weeks. Three assessments were conducted: before the intervention, after completion of the hydrotherapy phase, and after completion of the entire program. The results showed that hydrotherapy led to a reduction in pain and improvement in balance, while land-based exercises further contributed to an increase in trunk muscle strength. In conclusion, a combined and individualized intervention consisting of hydrotherapy and land-based exercises appears to be an effective approach for improving functional status in individuals with chronic low back pain.

Keywords: Chronic low back pain, hydrotherapy, land-based exercises

ASSESSMENT OF METABOLIC OBESITY INDICATORS IN INDIVIDUALS WITH INTELLECTUAL DISABILITY AND NEURODEVELOPMENTAL DISORDERS

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Epidemiological evidence suggests that simple and inexpensive anthropometric measures can be used to predict cardiometabolic health. These include traditional measures such as body mass index (BMI) and waist circumference (WC), which have been widely used in clinical practice for decades, as well as more recent indices such as the Body Roundness Index (BRI), A Body Shape Index (ABSI), and the Waist-to-Height Ratio (WHtR). The aim of the present study was to assess metabolic obesity indicators in individuals with intellectual disabilities and neurodevelopmental disorders. A total of 105 individuals participated in the study, with a mean age of 31.76±10.22 years, height of 164.23±13.09 cm, body mass of 76.93±19.04 kg, and BMI of 28.62±6.92 kg/m². Participants were categorized according to obesity status (normal weight, n=13; overweight, n=16; obese, n=17), gender (male, n=33; female, n=13), and type of disability (Intellectual Disability, n=11; Down Syndrome, n=27; Autism Spectrum Disorder, n=8). Measurements were obtained during an official national competition of Special Olympics Hellas and included body mass, height, body composition, and circumferences (waist, abdominal, and iliac). Using established equations, the following indices were calculated: Waist-to-Height Ratio (WHtR), Body Mass Index (BMI), Body Surface Area (BSA), Body Shape Index (ABSI), and Body Roundness Index (BRI). Data analysis revealed statistically significant differences between males and females in body fat ($p<0.01$), lean body mass ($p<0.001$), bone mass ($p<0.001$), BSA ($p<0.01$) and ABSI ($p<0.001$). Overweight participants exhibited higher waist and abdominal circumferences ($p<0.001$), body fat percentage ($p<0.001$), and higher values for BRI ($p<0.001$) and WHtR ($p<0.001$). Obese male and female participants demonstrated elevated values across all anthropometric indices, indicating increased cardiometabolic risk (ABSI>0.798). These findings highlight elevated obesity-related health indices in individuals with intellectual disabilities and neurodevelopmental disorders, potentially due to reduced physical activity and altered dietary habits. The combined use of traditional indices (BMI, WHtR, BSA) and newer indices (ABSI, BRI) is essential for a more comprehensive assessment of body composition and population health, as well as for informing targeted public health interventions.

Keywords: BMI, obesity indices, intellectual disabilities, neurodevelopmental disorders

ASSOCIATION BETWEEN METABOLIC OBESITY INDICATORS AND HEMODYNAMIC RESPONSES IN INDIVIDUALS WITH INTELLECTUAL DISABILITY AND NEURODEVELOPMENTAL DISORDERS

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Hypertension is a significant public health concern affecting individuals across all age groups, including those with and without disabilities. Among individuals with intellectual disabilities, the risk of hypertension is heightened due to factors such as obesity, low physical activity, and comorbid conditions. The aim of the present study was to assess the association of metabolic obesity indicators with hemodynamic parameters in individuals with intellectual disabilities and neurodevelopmental disorders. A total of 105 individuals participated in the study, aged 31.76±10.22 years, height 164.23±13.09 cm, body mass 76.93±19.04 kg, and BMI 28.62±6.92 kg/m². Participants were categorized according to obesity status (normal weight, n=13; overweight, n=16; obese, n=17), gender (male, n=33; female, n=13), and type of disability (Intellectual Disability, n=11; Down Syndrome, n=27; Autism Spectrum Disorder, n=8). Measurements were obtained during an official national competition of Special Olympics Hellas and included anthropometric characteristics (body mass, height, body composition, and circumferences waist, abdominal, and iliac) and blood pressure at rest (SP: Systolic, DP: Diastolic). The following indices were calculated using established equations for Body Mass Index (BMI), Waist-to-Height Ratio (WHtR), A Body Shape Index (ABSI), Body Roundness Index (BRI), Pulse Pressure at rest (PPR), Mean Arterial Pressure (MAP) and Stroke Volume (SV). Statistical analysis revealed significant positive correlations between SP and weight ($r=0.411$, $p<0.01$), muscle mass ($r=0.359$, $p<0.05$), waist circumference ($r=0.339$, $p<0.05$), iliac circumference ($r=0.400$, $p<0.01$) and BSA ($r=0.451$, $p<0.001$) while DP was positively correlated only with iliac circumference ($r=0.336$, $p<0.05$) and ABSI ($r=0.348$, $p<0.05$). Furthermore, MAP was positively correlated with weight ($r=0.330$, $p<0.05$), muscle mass ($r=0.295$, $p<0.05$), lean body mass ($r=0.300$, $p<0.05$), iliac circumference ($r=0.402$, $p<0.01$) and BSA ($r=0.312$, $p<0.05$) while PPR was correlated with BSA ($r=0.377$, $p<0.01$). In contrast, SV was negatively correlated with ABSI ($r=-0.328$, $p<0.05$), WHtR ($r=-0.318$, $p<0.05$), and BRI ($r=-0.314$, $p<0.05$). These findings indicate that obesity-related anthropometric indices, especially those reflecting central adiposity, are significantly associated with hemodynamic responses in individuals with intellectual disabilities and neurodevelopmental disorders. Increased body mass and fat distribution are linked to higher blood pressure and mean arterial pressure, while body shape indices are inversely associated with stroke volume, suggesting potential alterations in cardiovascular function.

Keywords: BMI, obesity indices, intellectual disabilities, neurodevelopmental disorders

ASSOCIATION BETWEEN METABOLIC OBESITY INDICATORS AND HEMODYNAMIC RESPONSES IN YOUNG ADULTS

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Obesityrelated hypertension in young adults constitutes a significant and growing public health concern, driven by complex metabolic interactions. The aim of the present study was to examine the association between metabolic obesity indicators and hemodynamic parameters in young adults. A total of 139 individuals participated in the study (age: 18.51±1.46 years; height: 172.64±10.06 cm; body mass: 68.50±12.09 kg; BMI: 22.85±2.65 kg/m²; body fat: 20.05±6.50%). Participants were categorized based on obesity status (normal weight, n=114; overweight/obese, n=25) and gender (male, n=79; female, n=60). Measurements included anthropometric characteristics (body mass, height, body composition, waist, abdominal, and iliac circumferences) and resting blood pressure (SP: systolic, DP: diastolic). The following indices were calculated using established equations for Body Mass Index (BMI), Waist-to-Height Ratio (WHtR), Body Surface Area (BSA), A Body Shape Index (ABSI), Body Roundness Index (BRI), Pulse Pressure at rest (PPR), Mean Arterial Pressure (MAP) and Stroke Volume (SV). Statistical analysis revealed significant positive correlations between systolic pressure and ABSI ($r=0.255$, $p<0.01$), BSA ($r=0.267$, $p<0.01$), WHtR ($r=0.251$, $p<0.01$), BRI ($r=0.183$, $p<0.05$), and WHR ($r=0.196$, $p<0.05$). Similarly, diastolic pressure was positively correlated with ABSI ($r=0.261$, $p<0.01$), BSA ($r=0.248$, $p<0.01$), WHtR ($r=0.259$, $p<0.01$), BRI ($r=0.182$, $p<0.05$), and WHR ($r=0.196$, $p<0.05$). MAP showed comparable positive associations with ABSI ($r=0.262$, $p<0.01$), BSA ($r=0.259$, $p<0.01$), WHtR ($r=0.259$, $p<0.01$), BRI ($r=0.185$, $p<0.05$), and WHR ($r=0.199$, $p<0.05$). Additionally, SV was significantly correlated only with BSA ($r=0.450$, $p<0.001$). The findings suggest that obesity-related anthropometric indices, particularly those reflecting body fat distribution, such as WHtR, ABSI, and BRI, are significantly associated with hemodynamic parameters in young adults. These results highlight the importance of early assessment of body composition and fat distribution, beyond traditional BMI, for identifying individuals at increased cardiovascular risk. Incorporating such indices into routine screening may contribute to earlier prevention and targeted interventions aimed at reducing the long-term burden of hypertension and cardiovascular disease.

Keywords: BMI, central adiposity, arterial pressure, obesity, young population

ASSOCIATION BETWEEN OBESITY INDICES AND PHYSICAL PERFORMANCE IN INDIVIDUALS WITH INTELLECTUAL DISABILITIES AND NEURODEVELOPMENTAL DISORDERS

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The prevalence of obesity is higher among individuals with intellectual disabilities compared to the general population, largely due to social and environmental factors. Limitations in cognitive function, communication, and physical capacity often contribute to reduced participation in physical activity, thereby increasing the risk of obesity and related health complications. This study aimed to examine the association between obesity indices and physical performance in individuals with intellectual disabilities and neurodevelopmental disorders. A total of 105 participants were included, with a mean age of 31.76±10.22 years, height of 164.23±13.09 cm, body mass of 76.93±19.04 kg, and BMI of 28.62±6.92 kg/m². Participants were categorized according to obesity status (normal weight, n=13; overweight, n=16; obese, n=17), gender (male, n=33; female, n=13), and type of disability (Intellectual Disability, n=11; Down Syndrome, n=27; Autism Spectrum Disorder, n=8). Measurements were obtained during an official national competition of Special Olympics Hellas and included anthropometric characteristics (body mass, height, body composition, and circumferences waist, abdominal, and iliac). The following indices were calculated using established equations for Body Mass Index (BMI), Waist-to-Height Ratio (WHtR), A Body Shape Index (ABSI), and Body Roundness Index (BRI). Additionally, health-related physical fitness was assessed through tests of aerobic endurance, flexibility, and muscular strength (2-min step test, Timed Up and Go 2.44 m, chair sit-and-reach, back scratch test, handgrip strength, and weighted elbow bend). Statistical analysis revealed significant negative correlations between flexibility (back scratch test) and BMI ($r=-0.328$, $p<0.05$), WHtR ($r=-0.394$, $p<0.01$), and BRI ($r=-0.370$, $p<0.05$), while a strong positive correlation was observed with lean body mass ($r=0.662$, $p<0.001$). Furthermore, ABSI was positively correlated with upper-body strength (weighted elbow bend; $r=0.582$, $p<0.001$). These findings indicate that increased adiposity is associated with reduced physical performance, particularly flexibility, whereas lean body mass contributes positively to functional capacity. The combined use of traditional and novel obesity indices may provide a more comprehensive evaluation of body composition and its impact on physical function. Targeted exercise and lifestyle interventions are recommended to reduce obesity and improve physical fitness in this population.

Keywords: BMI, obesity indices, intellectual disabilities, physical performance

ASSOCIATIONS OF SARCOPENIC OBESITY INDICES AND LIFESTYLE HABITS WITH MUSCLE FUNCTION IN YOUNG ADULTS

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The transition to young adulthood is often accompanied by lifestyle changes, including reduced physical activity, increased sedentary behavior, higher alcohol consumption, and increased screen time. These factors may negatively impact body composition, leading to an increase in fat mass and a concomitant decrease in muscle mass and functionality. The purpose of the study was to investigate the relationships between sarcopenic obesity indices, lifestyle parameters, and muscle function in young adults. Participants comprised 137 first-year students (n=76 males, n=61 females), aged 17–19 years, from the Department of Physical Education and Sport Science at the Democritus University of Thrace. Body composition was evaluated using a three-frequency bioelectrical impedance analyzer (Tanita MC-780MA-N) and maximal isometric upper-limb strength was assessed with a digital handgrip dynamometer (KFORCE, Kinvent). Lifestyle data, including physical activity, screen time, smoking habits, and alcohol consumption, were collected through individual questionnaires. Sarcopenic obesity was evaluated using handgrip strength to body mass index ratio (Grip-to-BMI), fat-free mass index (FFMI), handgrip strength to FFMI (Grip-to-FFMI) and fat mass index (FMI). Data analysis showed that males significantly outperformed females ($p<0.001$) in handgrip strength (males: 42.3±7.37 kg, females: 25.4±3.79 kg) and in the Grip-to-BMI ratio index (males: 1.82±0.32 kg/kg/m2, females: 1.18±0.21 kg/kg/m2). Further, the Grip-to-BMI ratio index demonstrated a significant negative correlation with FMI in both males ($r=-0.365$, $p=0.001$) and females ($r=-0.635$, $p<0.001$). Additionally, a significant positive correlation was found between the Grip-to-BMI and Grip-to-FFMI indices in both males ($r=0.764$, $p<0.001$) and females ($r=0.631$, $p<0.001$). Regarding lifestyle habits, a negative correlation was observed between Grip-to-FFMI and alcohol consumption in males ($r=-0.239$, $p<0.05$) and with smoking in females ($r=-0.268$, $p<0.05$). Increased fat mass is associated with reduced muscle strength relative to body weight, while higher values of the Grip-to-BMI and Grip-to-FFMI indices are linked to better muscle functionality. The results highlight the importance of assessing muscle quality and function beyond measuring muscle or fat mass alone, as well as the necessity of promoting healthy lifestyle habits among young adults.

Keywords: Handgrip Strength, Grip-to-BMI Ratio, Fat-Free Mass Index (FFMI), Fat Mass Index (FMI), Lifestyle

ASSOCIATIONS OF SARCOPENIC OBESITY INDICES WITH MUSCLE FUNCTION IN CHILDHOOD AND ADOLESCENCE

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Sarcopenic obesity is increasingly observed in children and adolescents, characterized by high body fat percentage (%BF), lean–fat imbalance and reduced muscle function. The purpose of the present study was to investigate the relationship between indices that define sarcopenic obesity and muscle function in school-aged children. A total of ninety-five male and female primary and secondary school students voluntarily participated in the study (age: 11.06±1.64 years; body weight: 47.23±12.57 kg; body fat (%): 25.05±6.98). Participants were categorized by sex, age group (8–11 years, 12–14 years) and obesity status (normal weight, overweight/obese). Body composition was assessed using a multi-frequency bioelectrical impedance analyzer (Tanita MC-780MA-N) and maximal isometric upper limb strength was measured with a digital handgrip dynamometer (KFORCE by Kinvent). Sarcopenic obesity was evaluated through the following indices: handgrip strength to body mass index ratio (Grip-to-BMI), fat-free mass index (FFMI), and fat mass index (FMI). Statistical analysis included a three-way ANOVA for independent samples (Sex × Age Group × Obesity Status; 2×2×2) and Pearson's correlation (r). The results indicated that obesity status and sex had a statistically significant effect ($p<0.05$) on all examined indices (Grip-to-BMI, FFMI and FMI), with overweight and obese children presenting higher values of both fat and lean mass. Additionally, age had a statistically significant effect on relative handgrip strength (Grip-to-BMI) and FFMI ($p<0.05$). A statistically significant negative correlation was observed between Grip-to-BMI and FMI in both boys ($r=-0.462$, $p<0.001$) and girls ($r=-0.347$, $p<0.05$). In contrast, no statistically significant correlation was found between Grip-to-BMI and FFMI ($r=0.094$, $p>0.05$). The findings suggest that overweight and obese children exhibit increased fat and lean mass, but lower relative handgrip strength (Grip-to-BMI) compared to normal-weight peers. Furthermore, age appears to significantly influence both relative strength and lean mass, highlighting the role of growth and development in physical fitness. In conclusion, the results emphasize the importance of assessing relative muscle strength rather than solely absolute muscle mass, particularly in juvenile populations with elevated fat mass. The evaluation of strength relative to BMI appears to be a useful indicator of functional capacity in the juvenile population.

Keywords: Grip-to-BMI ratio, Fat Mass Index, Free Fat Mass Index, Juvenile Population

C-REACTIVE PROTEIN AND GLYCATED HAEMOGLOBIN IN CHILDREN AND THEIR ASSOCIATIONS WITH ANTHROPOMETRIC MEASURES, PHYSICAL ACTIVITY, AND FITNESS: THE HEALTH-ORIENTED PEDAGOGICAL PROJECT (HOPP)

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Background: Early-life variation in inflammatory and glycaemic biomarkers may provide insight into the developmental origins of cardiometabolic disease. While obesity is a recognized driver of low-grade inflammation, less is known about whether body composition and fitness are associated with inflammatory and glycaemic markers in predominantly normal-weight children. Objective: To examine associations of anthropometric measures, body composition, and physical activity with CRP and HbA1c in healthy schoolchildren. Methods: This cross-sectional study used baseline data from the Health Oriented Pedagogical Project (HOPP). A total of 1,339 children aged 6–12 years provided venous blood samples and valid anthropometric and fitness data. WHtR, percent body fat, fat mass, and muscle mass were assessed using standardized procedures and BIA. Physical activity was measured by accelerometry. Aerobic fitness was evaluated with the Andersen intermittent running test and, in a subsample, directly measured VO_2peak. CRP and HbA1c were analysed from non-fasting venous blood. Associations were examined using linear regression and ANOVA adjusted for age and sex. Cubic B-spline models were fitted for CRP versus percent body fat and WHtR. Results: The cohort was predominantly normal weight, with more than 95% classified within the normal BMI range. Girls had higher fat mass and percent body fat, whereas boys had greater muscle mass, but no sex differences were found for CRP or HbA1c. HbA1c values were tightly distributed within the normal range and varied by age, peaking at 8–9 years. In adjusted analyses, WC and percent body fat were positively associated with CRP, while WHtR showed a borderline non-significant association. Spline analyses demonstrated modest curvilinear increases in CRP across increasing percent body fat and WHtR. HbA1c was positively associated with Andersen test performance and muscle mass, but effect sizes were small and values remained within normal limits. Conclusions: Among normal-weight children, adiposity was associated with higher CRP, supporting the view that low-grade inflammation may begin early in life. Associations between HbA1c, fitness, and muscle mass were small and likely reflect normal developmental physiology. These findings highlight the importance of body composition in immunometabolic health and support longitudinal follow-up to determine whether childhood patterns predict later cardiometabolic risk.

Keywords: CRP, HbA1c, WHtR, children

CARDIORESPIRATORY AND METABOLIC RESPONSES DURING INTERVAL EXERCISE OF DIFFERENT INTENSITIES AND DURATION WITH EQUAL EXPENDITURE OF W' PRIME

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High intensity interval exercise is considered an effective training method both for cardiorespiratory and metabolic responses and is typically prescribed based on percentage of VO2max, HRmax or maximum aerobic power. On other option for exercise prescription can be the use of finite work capacity (W') which accounts both the aerobic and anaerobic capacity of an individual. The purpose of the study was to investigate the cardiorespiratory and metabolic responses during two interval exercise sessions differing in the combination of repetition intensity and duration, while maintaining equal W' expenditure per repetition and across the entire session. Fourteen participants (7 men: 24.0 ± 5.6 years; 7 women: 21.0 ± 3.4 years) executed two training sessions. At the first session the intensity was set at 90% and at the second session at 110% of the maximum aerobic power. At both sessions, the duration of each repetition was individualized so that at the end of it, 40% of the W' had been spent and rest duration was such that at the end of four repetitions 10% of W' was left. As a result of the consumption of W' during the repetitions and the reconstitution during the rest periods, 150% of W' was spent at each program. Heart rate (HR), stroke volume (SV), cardiac output (CO), VO2, and arterio-venous oxygen difference (avO2diff) were recorded during exercise. Results showed that mean HR and VO_2 were higher ($p < .05$) during the first two repetitions at session 90% compared to session 110%. Cardiac output and stroke volume increased ($p < .05$) from the second to the fourth repetition compared to the first repetition in both sessions and were higher ($p .05$) between the two sessions or across repetitions. Blood lactate was higher ($p < .05$) at middle of the sessions with intensity at 90% but at the end was higher with the intensity at 110% of maximal aerobic power. It appears that although two interval training sessions of a different combination of exercise intensity and duration are equalized based on W' they may not cause similar cardiorespiratory and metabolic responses.

Keywords: HIIT, W', cardiovascular responses

CHANGES IN MUSCLE AND BRAIN OXYGENATION DURING INTERVAL EXERCISE OF DIFFERENT INTENSITIES AND DURATIONS BUT OF EQUAL TOTAL EXPENDITURE OF THE FINITE WORK CAPACITY

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Near-infrared spectroscopy is a non-invasive method for monitoring the availability and utilization of oxygen in the muscles and the brain. The purpose of the study was to investigate the changes in the oxygenation of the vastus lateralis muscle and the prefrontal cortex during two interval exercise sessions of different intensities and repetition durations, but of equal expenditure of the finite amount of energy (W') per repetition and the whole sessions. The sample were 7 men (24.0 ± 5.6 years) and 7 women (21.0 ± 3.4) at whom critical power and W' were determined to design two aerobic interval programs, one at an intensity of 90% and another of 110% of the maximum aerobic power. The duration of each repetition was individualized so that at the end of it, 40% of W' had been spent and rest duration was such that at the end of four repetitions 10% of W' was left. As a result of the consumption of W' during the repetitions and the reconstitution during the rest periods, 150% of W' was spent at each program. O2Hb, HHb, tHb TSI were recorded during the execution of the sessions and the range of changes and average values at each repetition were calculated. The mean values and the range of changes of O2Hb, HHb and tHb in the prefrontal cortex and the vastus lateralis did not differ ($p>0.05$) between the two training sessions across repetitions. HHb, tHb, TSI range of change in the muscle were higher ($p<0.05$) at the first repetition compared to the other three repetitions except of the O2Hb values where at the first repetition were lower than the other three. O2Hb and tHb mean values at the muscle ($p<0.05$) and HHb , O2Hb and tHb mean values at the brain were lower ($p<0.05$) at the first repetition compared to the other three repetitions. It appears that in two interval training protocols when the intensity and duration of repetitions are combined in such a way as to deplete the same amount of W', muscle and brain oxygenation changes are similar despite differences in the intensity of the workouts.

Keywords: Nirs , W' Prime , Interval Exercise.

CORRELATION BETWEEN BURNOUT, QUALITY OF LIFE, AND SLEEP QUALITY IN HEALTHCARE PROFESSIONALS

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Burnout syndrome is a state of emotional, physical, and mental exhaustion caused by excessive and prolonged stress, primarily related to work. It typically occurs when individuals feel overwhelmed, emotionally drained, and unable to cope with ongoing demands. This psychological syndrome may include symptoms such as increased fatigue, weakness, sleep disturbances, somatic complaints, and reduced personal accomplishment, particularly among healthcare professionals. The aim of the present study was to examine the relationship between burnout, quality of life, and sleep quality among healthcare professionals. The sample consisted of 120 participants (27.5% physicians, 31.66% paramedical staff, and 40.83% nursing staff). Data were collected using three standardized instruments: the Maslach Burnout Inventory, the SF-12 Health Survey, and the Pittsburgh Sleep Quality Index. Principal component analysis revealed five factors which explained 67.58% of the total variance, followed by emotional exhaustion (25.58%), depersonalization (16.32%), personal accomplishment (11.36%), emotional desensitization (7.69%), and professional inefficacy (6.61%). A total 18.3% of healthcare professionals reported experiencing burnout at least once per week or daily, while 75% reported experiencing it a few times per month (χ^2=11.44, df=4, p=0.022). Nursing staff reported significantly higher levels of exhaustion compared to paramedical staff ($p<0.05$) and physicians ($p<0.01$). Burnout was also negatively associated with overall quality of life ($r=-0.241$, $p<0.01$) and the mental health component ($r=-0.454$, $p<0.001$), whereas quality of life was positively associated with sleep quality ($r=0.474$, $p< 0.001$). These findings suggest that burnout significantly reduces both quality of life and sleep quality among healthcare professionals. However, this relationship may be bidirectional, as poor sleep quality may also contribute to increased levels of burnout. In conclusion, burnout represents a significant issue among healthcare professionals, highlighting the need for targeted interventions and preventive strategies.

Keywords: Burnout, quality of life, sleep quality, health care professionals, Maslach burnout inventory, SF-12, Pittsburgh sleep quality index

CORRELATION BETWEEN METABOLIC OBESITY INDICES AND HEALTH-RELATED PHYSICAL FITNESS PERFORMANCE IN MALE AND FEMALE UNIVERSITY STUDENTS

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Physical fitness among university students constitutes a key objective of sport and health promotion, aiming to encourage active participation in physical activity, foster lifelong exercise habits, and enhance overall health. However, rapid technological advancements and the widespread use of electronic devices have contributed to increasingly sedentary lifestyles. This decline in physical activity is associated with increased body mass and adiposity, leading to reduced physical fitness and raising concerns about students' current and future health. This study aimed to examine the association between metabolic obesity indices and health-related physical fitness in university students. A total of 139 participants (age: 18.51±1.46 years; height: 172.64±10.06 cm; body mass: 68.50±12.09 kg; BMI: 22.85±2.65 kg/m²; body fat: 20.05±6.50%) were categorized by obesity status (normal weight, n=114; overweight/obese, n=25) and gender (male, n=79; female, n=60). Anthropometric measurements included body mass, height, body composition, and waist, abdominal, and iliac circumferences. Health-related fitness was assessed using the "Health-Related Alpha Fitness Battery for Adults," including tests of handgrip strength, vertical jump, flexibility, balance, speed of limb movement, and muscular strength. Metabolic obesity indices calculated were BMI, Waist-to-Height Ratio (WHtR), A Body Shape Index (ABSI), and Body Roundness Index (BRI). Statistical analysis revealed significant positive correlations between handgrip strength and body mass (R: r=0.283, p<0.001; L: r=0.311, p<0.001) and lean body mass (R: r=0.395, p<0.001; L: r=0.432, p<0.001), and strong negative correlations with body fat (R: r=-0.419, p<0.001; L: r=-0.456, p<0.001). Vertical jump was positively correlated with body mass (r=0.250, p<0.01) and lean mass (r=0.376, p<0.001) and negatively with body fat (r=-0.421, p<0.001). Sit-and-reach flexibility was negatively correlated with ABSI (r=-0.314, p<0.001), WHtR (r=-0.250, p<0.01), and BRI (r=-0.213, p<0.05). Balance also showed negative correlations with body mass (r=-0.352, p<0.001) and body fat (r=-0.320, p<0.001). Higher body fat is consistently associated with poorer performance in strength, power, flexibility, and balance, while greater lean mass enhances physical performance. Central adiposity indices, such as ABSI, WHtR, and BRI, negatively affect functional fitness. These findings underscore the importance of promoting regular physical activity and healthy body composition to improve health-related fitness and reduce long-term health risks in university students.

Keywords: Muscular strength, flexibility, balance, obesity indices, university students.

CORRELATION BETWEEN UPPER BODY MUSCLE STRENGTH, LEAN MASS AND TRICEPS BRACHII MUSCLE ARCHITECTURE IN MODERATE TRAINED FEMALES

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Upper body muscle strength influence functional capacity and quality of life, particularly in women. Resistance training is widely recognized for its efficacy in increasing muscle strength and inducing muscle hypertrophy. However, the association between lean mass and maximum strength is not consistently linear, since other factors also modulate muscle strength production. Therefore, the aim the study was to investigate the association of upper body muscle strength with upper extremities lean mass and triceps brachii' muscle thickness in young females. Twenty young physical education female students (age: 20.1±0.3 years, height: 164.9±4.6cm, mass: 61.7±6.1kg), with moderate experience in systematic resistance training participated in the study. Bench press maximum strength (1-RM), body composition (via dual energy x-ray absorptiometry) and triceps brachii' long head muscle thickness (via ultrasonography) were evaluated. Pearson's (r) product–moment correlation coefficients were computed to explore the relationships between variables. Significant correlation was found between 1-RM bench press and lean mass of upper extremities ($r = 0.596$, $p = 0.006$). On the contrary, no significant correlations were found between 1-RM bench press and total lean body mass ($r = 0.313$, $p > 0.05$) and triceps brachii' long head muscle thickness ($r = 0.222$, $p > 0.05$). The results of the present study suggest that upper extremities lean mass may be a more significant determinant of 1RM performance in bench press, compared to triceps brachii' muscle thickness, at least in young moderate trained females. In conclusion, even in young females without prior resistance training experience, upper extremities lean mass is significantly associated with upper body muscle strength, highlighting the importance of assessing local muscle development in the design of training programs, as well as for health monitoring and influencing functional capacity and quality of life.

Keywords: Resistance Training, Muscle Hypertrophy, Upper Body Muscle Strength, Muscle Architecture, Ultrasonography

DECIPHERING THE LIMITS OF CARDIORESPIRATORY ENDURANCE: A CASE STUDY OF A POST-PUBERTAL ATHLETE

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An effective oxygen transport to the exercising muscles stands as a prerequisite for high-level performance in endurance sports. The aim of the present case study was to describe body composition, hematological, and cardiorespiratory parameters associated with a historically high maximal oxygen uptake measured in a Greek Modern Pentathlon athlete. The participant abstained from intense exercise, food intake, and caffeinated beverages for the 12 hours preceding the laboratory visit. Hemoglobin concentration and hematocrit were assessed from venous blood using a hematology analyzer. Body fat percentage was estimated using air displacement plethysmography. The athlete subsequently performed an incremental exercise test to exhaustion on a treadmill, with initial running speed, incline, stage duration, and increment set at 12 $km \cdot h^{-1}$, +1%, 120 s, and 1 $km \cdot h^{-1}$, respectively. The anaerobic threshold (second ventilatory threshold) was identified as the nadir point of the ventilatory equivalent for carbon dioxide. Maximal oxygen uptake and pulmonary ventilation were calculated as the highest 30-second average values recorded within the same running speed. Hemoglobin concentration and hematocrit were found to be 151 $g \cdot L^{-1}$ and 43.0%, respectively, while body fat percentage was 8.5%. Maximal values for aerobic speed, pulmonary ventilation, and oxygen uptake were measured at 20.5 $km \cdot h^{-1}$, 179.1 $L \cdot min^{-1}$, and 80.3 mL $O_2 \cdot kg^{-1} \cdot min^{-1}$, respectively. The anaerobic threshold was estimated at 80.8% of maximal oxygen uptake. Although maximal oxygen uptake values exceeding 90 mL $O_2 \cdot kg^{-1} \cdot min^{-1}$ have previously been reported in cross-country skiers, the activation of a relatively low muscle mass during running exercise is not expected to have been a limiting factor for cardiorespiratory endurance in the examined athlete. Additional measurements (total blood volume, hemoglobin mass, cardiac output during exercise) are warranted to further elucidate the adaptation limits of the oxygen transport system to long-term endurance training.

Keywords: cardiorespiratory endurance, modern pentathlon, case study, maximal oxygen uptake, oxygen transport

DETECTION OF EATING DISORDERS AND BODY DYSMORPHIA IN THE GREEK POPULATION: PILOT STYDY

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In recent years, the importance of recognizing the early signs of the eating disorder spectrum, including relative low energy availability, or dissatisfaction with own body image, has gained prevalence. The primary purpose of the present study was to detect symptoms of low energy availability in a sample of young Greeks from the region of Thessaly. The study, which received ethical approval (1963/9-06-2022), was divided into two phases, the second of which was not mandatory. In the first phase, 30 participants (N=15 men and N=15 women) aged 18-23 years, completed the Eating Disorders Examination Questionnaire 6.0 (EDE-Q 6.0), the Body Dysmorphic Disorder Questionnaire (BDDQ), the Low Energy Availability in Females Questionnaire (LEAF-Q) and the Low Energy Availability in Males Questionnaire (LEAM-Q). The latter two were translated and cross-culturally adapted to the Greek language in a preceding research phase. Following the completion of the questionnaires, 8 subjects (N=5 men and N=3 women) participated in an assessment of height, weight, waist-pelvic circumference and body composition (with bioelectrical impedance analysis and with dual-energy X-ray absorptiometry, DEXA). Based on the results of the EDE-Q 6.0 questionnaire, none of the participants were at risk of developing an eating disorder. On the BDDQ, 13% of participants had positive BDD-screening. On the LEAF-Q, 27% of women exceeded the cut-off score, while on the LEAM-Q, 1 to 6 men showed worrying symptoms. There was no statistically significant gender difference in any questionnaires assessment scores. Encouragingly, in the subset of participants, no statistically significant differences were found between self-reported somatometric data and measured data. The study concludes that low energy availability is observed in a young population in both sexes, while highlighting the need for further research with a larger sample, especially for men.

Keywords: low energy availability,relative energy deficiency in sport (RED-S),body dysmorphic disorder,questionnaires,health

DIFFERENCES BETWEEN BOYS AND MEN IN MUSCLE FATIGUE, ELECTROMYOGRAPHIC ACTIVITY, AND MOTOR UNIT FIRING RATE DURING MAXIMAL ISOMETRIC CONTRACTIONS

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The present study investigated neural mechanisms of fatigue in boys and men during maximal repeated muscular efforts. The sample consisted of 10 boys (age: 11.45 ± 0.69 years, height: 149.93 ± 8.33 cm, body mass: 44.49 ± 8.91 kg) and 13 adult men (age: 21 ± 1.87 years, height: 177.38 ± 5.45 cm, body mass: 78.52 ± 9.09 kg), all healthy and track and field athletes. Each participant completed one familiarization session with the handgrip dynamometer and one experimental session. During the experimental session, participants performed a fatiguing protocol targeting the forearm muscles, consisting of 15 maximal handgrip contractions of 3 seconds each, with 3 seconds of rest between repetitions. Visual and auditory feedback was provided to ensure maximal effort. Throughout the protocol, force output and electromyographic activity of the flexor carpi ulnaris were recorded. Afterwards, the electromyographic signal was decomposed to investigate the size of the motor units activated and the frequency of activation of the motor units. The results showed that force, expressed as a percentage of the 1st repetition across the 15 maximal contractions, significantly decreased ($p = 0.01$) after the first four repetitions, with no differences ($p > 0.05$) between the two age groups. Regarding electromyographic activity, motor unit firing rate, and motor unit action potential, no statistically significant differences ($p > 0.05$) were observed across repetitions and between boys and men. These findings indicate that during repeated maximal muscular efforts, there are no differences between boys and men in either force decline or neuromuscular activation.

Keywords: Fatigue Mechanisms, Electromyography, Neuromuscular activation

EFFECT OF ANTHROPOMETRIC CHARACTERISTICS AND LOWER LIMB NEUROMUSCULAR ACTIVATION LEVEL ON VERTICAL JUMP PERFORMANCE IN YOUTH FEMALE VOLLEYBALL ATHLETES

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The aim of the present study was to investigate the association between anthropometric characteristics and the level of neuromuscular activation with vertical jump performance in young female volleyball athletes. The sample consisted of 22 youth female volleyball athletes (14–16 years old) of intermediate level. Anthropometric assessment included body height, mass, and fat percentage, as well as total and lean volume of the lower limb, thigh, and shank. The subjects executed five squat jumps (SJ), with 30 seconds of rest between trials, and after a 5-minute rest period, five countermovement jumps (CMJ). During the jumps, electromyographic (EMG) activity of the vastus medialis, rectus femoris, muscles was recorded using surface electrodes. The EMG signal was amplified, filtered, and converted into root mean square values (EMGrms), analyzed both throughout the concentric phase of the movement of muscle activation. Both absolute and normalized EMGrms values, based on reference EMG during isometric contractions when i) standing at the squat position with body weight (EMGbw) ii) during a maximal contraction at the squad position (EMGisomax), were used for the analyses. The subjects were separated into two equal groups, those with the highest and the lowest SJ and CMJ performance. The athletes with the highest SJ performance presented higher EMGisomax activity of RF (p= 0.02) and combined RF and VL (p= 0.04). The athletes with the highest CMJ performance presented higher EMGisomax and EMGbw activity of RF (p= 0.001), VL (p=0.001) and combined RF and VL (p= 0.001). For the whole sample, linear regression showed that anthropometric characteristics were not significantly correlated either with SJ (r= 0.037-0.2) or CMJ (r= 0.05- 0.248) performance. RF EMGisomax activity correlated (p= 0.068) with SJ performance (r= 0.396) whereas EMGisomax and EMGbw activity of both RF and VL showed a significant (p< 0.05) correlation with CMJ performance (r= 0.466-0.521). In conclusion, neuromuscular activation appears to be a more critical factor than morphological characteristics in determining vertical jump performance in a homogenous sample of youth female volleyball athletes.

Keywords: anthropometric characteristics, neuromuscular activation, lower limb, vertical jump

EFFECT OF MENSTRUAL CYCLE PHASES ON LOWER LIMB STRENGTH, POWER, AND AGILITY.

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The aim of this study was to examine the effect of menstrual cycle phases on lower limb performance in physically active young women. Thirty-one female students of the Department of Physical Education and Sport Science at Democritus University, with a mean age of 19.9 ± 1.5 years and a cycle duration of 28.7 ± 2.4 days, were assessed across three phases: menstrual (C1), ovulatory (C2), and mid-luteal (C3). Performance measures included maximal dynamic strength (1RM Squat), jump performance (CMJ, SJ), and change of direction ability (Compass Test). Statistical analyses were performed using repeated-measures ANOVA and Bonferroni-adjusted pairwise comparisons ($p < .05$). Results revealed significant differences across the three menstrual phases for all variables ($p < .05$). Maximal dynamic strength was observed to be lowest during the menstrual phase (C1: 71.77 ± 14.48 kg) and highest during the mid-luteal phase (C3: 82.02 ± 16.61 kg, $p < .05$), with intermediate values recorded in C2 (77.82 ± 16.48 kg). Explosive jump performance also peaked during C3 for both the countermovement jump (C1: 25.51 ± 4.09 cm vs. C3: 26.27 ± 4.50 cm) and the squat jump (C1: 24.26 ± 3.96 cm vs. C3: 25.12 ± 4.35 cm). Similarly, change of direction performance improved across phases, with significantly faster times recorded in C2 (7.56 ± 0.43 s) and C3 (7.38 ± 0.46 s) compared to C1 (7.77 ± 0.48 s, $p < .05$). In conclusion, lower limb strength, jump performance, and agility appear to be influenced by menstrual cycle–related fluctuations, with the lowest performance observed during the menstrual phase. The superior performance recorded during the mid-luteal phase (C3) may indicate that this period is more favorable for high-intensity physical tasks involving the lower extremities. These findings highlight the importance of considering menstrual cycle timing in training design for female athletes. Future studies should include hormonal verification and larger sample sizes across different fitness levels to further clarify these findings.

Keywords: Menstrual cycle phases, performance, maximal strength, jump performance, change of direction ability

EFFECT OF MENSTRUAL CYCLE PHASES ON UPPER LIMB MAXIMAL STRENGTH, POWER, SPEED AND COORDINATION

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The purpose of this study was to examine the effect of menstrual cycle phases on upper limb performance in physically active young women. Thirty-one (N=31) female students of the Department of Physical Education and Sport Science at Democritus University, with a mean age of 19.9 ± 1.5 years and a cycle duration of 28.7 ± 2.4 days, were assessed across three phases: menstrual (C1), ovulatory (C2), and mid-luteal (C3). Upper limb performance measures included maximal isometric hand grip strength, maximal dynamic strength (1RM bench press), explosive power (medicine ball throw), and speed and coordination (plate tapping test). Statistical analyses included repeated-measures ANOVA, the Friedman test, and Bonferroni-adjusted pairwise comparisons ($p < .05$). Maximal dynamic strength was observed to be lowest during the menstrual phase (C1: 34.84 ± 7.27 kg) and highest during the mid-luteal phase (C3: 38.47 ± 8.63 kg, $p < .05$). Similarly, handgrip strength followed a comparable pattern, with higher values in C2 (17.23 ± 4.35 kg) and C3 (17.40 ± 4.19 kg) compared to C1 (15.91 ± 4.67 kg). Medicine ball throw performance peaked in C2 (6.45 ± 1.02 m) and showed less variation across phases than strength measures. Upper limb speed and coordination improved across phases, with significantly faster times in C2 (7.95 ± 0.70 s) and C3 (7.91 ± 0.78 s) compared to C1 (8.56 ± 0.90 s, $p < .05$). In conclusion, upper limb performance in physically active women appears to be significantly impaired during the menstrual phase (C1), while reaching optimal levels during the mid-luteal phase (C3). These results highlight the importance of considering menstrual cycle timing in training design especially when scheduling maximal strength and explosive power training or speed testing for female athletes. Future studies should include hormonal verification and larger sample sizes across different fitness levels to further clarify these findings.

Keywords: Menstrual cycle phases,performance,handgrip strength,maximal strength,speed,coordination

EFFECTS OF AN EIGHT-WEEK COMBINED CIRCUIT TRAINING AND MAT PILATES ON BODY COMPOSITION IN POSTMENOPAUSAL WOMEN

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Hormonal changes during the postmenopausal period are associated with increased fat mass, particularly in the abdominal region, reduced lean mass, and body weight gain. The aim of this study was to examine the effects of a specialized combined circuit training and Mat Pilates program on body composition in women during the postmenopausal period. A total of twelve postmenopausal women (≥12 months of amenorrhea) voluntarily participated in the study (age: 58.42±5.17 yrs, postmenopausal age: 6.33±4.6 yrs, BMI: 25.57 ±4.92 kg/m², % Body Fat 33.06±6.5). The intervention lasted eight weeks, with three 60-minute sessions per week, and included two types of exercise. Each week consisted of one Mat Pilates session using a mini ball and two moderate-intensity circuit training sessions, comprising 10 whole-body exercises with progressively increased intensity and volume. Body composition was measured using a three-frequency (5 kHz, 50 kHz, 250 kHz) bioelectrical impedance analyzer (Tanita MC-780MA-N), providing data on body fat percentage, fat mass, fat-free mass, muscle mass, total body water (intracellular and extracellular), bone mass, visceral fat level, and cellular indicators such as phase angle. In addition, abdominal skinfold thickness and waist and abdominal circumferences were measured. Assessments were conducted at the beginning and end of the intervention program. Although a decreasing trend was observed in abdominal skinfold thickness (−5.97%), waist circumference (−2.21%) and abdominal circumference (−1.24%), no statistically significant changes were found in body composition parameters or anthropometric measurements ($p>0.05$). However, a statistically significant improvement was found in phase angle, $t(11)=-2.67$, $p<0.05$. In conclusion, the eight-week program combining circuit training and Mat Pilates appeared to enhance cellular health and strengthen cell membrane integrity, as reflected by an increase in phase angle. Additionally, the program helped maintain body weight while showing a trend toward reduced abdominal fat, which is particularly meaningful during the postmenopausal period. Future studies could explore the effects of longer interventions or the combination of exercise and nutrition programs to further optimize outcomes.

Keywords: Menopause, Fat Mass, Lean Mass, Phase Angle, Exercise

EFFECTS OF COMBINED CIRCUIT TRAINING AND MAT PILATES ON DYNAMIC BALANCE IN POSTMENOPAUSAL WOMEN

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Menopause is characterized by complex, multifactorial physiological alterations that compromise functional capacity, leading to impaired musculoskeletal stability and an increased risk of falls. The aim of this study was to examine the effects of a specialized combined circuit training and mat Pilates on dynamic balance in postmenopausal women. Twelve postmenopausal women voluntarily enrolled in the study (mean age: 58.42 ± 5.17 yrs, mean postmenopausal age: 6.33 ± 4.6 yrs, mean body weight: 69.61 ± 11.21 kg, mean height: 1.65 ± 0.06 m, mean BMI: 25.57 ± 4.92 kg/m²). Dynamic balance was evaluated using the Y-Balance Test (Lower Quarter), administered both prior to and following completion of the exercise program. The intervention spanned eight weeks, with a frequency of three sessions per week, and comprised two distinct training modalities. Specifically, the intervention consisted of one mat Pilates session utilizing a mini ball and two moderate-intensity circuit training sessions, which included 10 whole-body exercises of progressively increased intensity and volume. Each training session lasted 60 minutes. The overall dynamic balance of both lower limbs, as well as potential inter-limb asymmetries, were quantified using specialized equations. Statistical analysis was performed using the paired samples t-test to compare pre- and post-intervention values of the measured variables. The level of statistical significance was set at $p < 0.05$. The results of the present study revealed a statistically significant improvement in the composite scores across the three directions (anterior, posterolateral, and posteromedial) for the right lower limb ($t(11) = -4.034$, $p < 0.001$) and the left lower limb ($t(11) = -3.397$, $p < 0.01$) after the exercise program. It is concluded that an eight-week specialized combined exercise program, including Mat Pilates and moderate-intensity interval circuit training, can significantly enhance dynamic postural control and balance in postmenopausal women. These findings further support the role of exercise as an effective non-pharmacological intervention for reducing fall risk in this population.

Keywords: Fall Risk, Menopause, Y-Balance Test, Exercise

EFFECTS OF COMBINED EXERCISE AND EXERCISE CESSATION ON CARDIOVASCULAR RESPONSES ACROSS BODY POSITIONS IN A PATIENT WITH HYPERTENSION: A CASE STUDY

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Systematic exercise is a key non-pharmacological strategy for managing arterial hypertension and type 2 diabetes, improving both cardiovascular function and glycemic control. The aim of this case study was to investigate cardiovascular responses to a combined exercise program (aerobic and resistance training) in a diabetic patient with stage 2 hypertension. The participant was a 68-year-old male (129kg, 183cm) monitored over 24 weeks. The protocol included two 8-week exercise periods, separated by two 4-week detraining periods. Two exercise programs were applied: i) continuous aerobic exercise combined with resistance training and ii) interval aerobic exercise combined with resistance training. Sessions were conducted three times per week. The intensity of continuous aerobic exercise ranged from 95% to 110% of HR_1, while interval exercise ranged from 105% to 120% of HR_2, with active recovery periods at 52–60%. Resistance training involved major muscle groups (3 sets of 12–15 repetitions at 65–70% of 1RM). Measurements were taken at five time points at rest, in three different body positions (supine, seated, and standing) for five minutes each, using a non-invasive continuous monitoring system (Finapres Nova Plus). Key variables evaluated included SYS, DIA, HR, SV, DPTI, and RPP. Results showed improvements and positive adaptations mainly in hemodynamic parameters, suggesting that interval aerobic exercise combined with resistance training may be more effective for hypertension management. Furthermore, periods of exercise cessation led to regression of positive cardiovascular adaptations, observed in all three body positions. In conclusion, combined exercise programs emphasizing higher-intensity aerobic sessions appear to be an effective and safe intervention to improve cardiovascular health in older adults with metabolic comorbidities.

Keywords: hypertension, exercise cessation, body positions, combined exercise, hemodynamic adaptations

EFFECTS OF REFORMER PILATES TRAINING ON CARDIOMETABOLIC MARKETS IN POSTMENOPAUSAL WOMEN

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Postmenopausal women constitute a vulnerable population group, characterized by adverse cardiometabolic changes and an increased risk of cardiovascular diseases. Regular physical activity has been shown to play a significant role in the prevention and improvement of these parameters. The aim of the present study was to investigate the effects of a Reformer Pilates exercise program on cardiometabolic markers in postmenopausal women. A total of ten (n = 10) women with at least 12 months of amenorrhea participated in the study. Their mean age was 56.17 ± 5.08 years, and the average time since menopause onset was 5.0 ± 3.3 years. All measurements were conducted following written informed consent. The exercise intervention lasted five weeks and included three sessions per week, each lasting 50 minutes and consisting of warm-up, main exercise, and cool-down phases. The sessions involved exercises performed on Reformer Pilates machines, with progressive overload achieved through gradual increases in spring resistance, as well as the use of additional equipment such as mini balls, toning balls, and a Pilates stick. Anthropometric characteristics and body composition were assessed before and after the intervention using a bioelectrical impedance analyzer (MC-780MA-N S). In addition, key cardiometabolic indicators were evaluated and recorded before and after each exercise session, including blood glucose levels (via CONTOUR® Care glucometer), heart rate, and blood pressure (via MicroLife BP B3 Afib digital monitor). The results revealed statistically significant differences across the five weeks in blood glucose levels (Wilks' λ=0.865, F(8,260)=2.437, p=0.015) and resting heart rate (Wilks' λ =0.847, F(8,260)=2.819, p =0.005). The overall percentage reduction in blood glucose levels reached 9.2% for pre-session measurements (103.5 vs. 93.5 mg/dL), while a smaller reduction (5.3%) was observed for post-session measurements (101.1 vs. 96.8 mg/dL). In contrast, no statistically significant changes were observed in systolic and diastolic blood pressure (p>0.05), a finding considered expected given that participants were normotensive. Overall, the findings support the hypothesis that this training intervention promotes metabolic and cardiovascular health, highlighting the importance of consistent, long-term exercise.

Keywords: Reformer Pilates, postmenopausal women, blood glucose, cardiometabolic health

ELECTROMYOGRAPHIC ACTIVITY AND MOVEMENT VELOCITY DURING THE EXECUTION OF A SPEED-STRENGTH TRAINING SESSION WITH CLUSTER AND CONTINUOUS SETS.

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The purpose of this study was to compare the changes in movement speed and electromyographic activity during the performance of a speed-strength training session using continuous and intermittent sets. Thirteen (9 men and 4 women) young individuals performed at the half-squat exercise (90° knee angle) a training session with continuous sets and another one with intermittent sets using a load 70% of 1RM. The continuous set session consisted of 6 sets of 6 repetitions with a 2-minute rest between sets. The program with the intermittent sets consisted of 6 sets of 6 repetitions, with a 30-second rest after the first 3 repetitions and a 1.5-minute rest between sets. The subjects were instructed to execute the concentric phase of each repetition with maximum velocity. During the sets, thigh movement velocity and electromyographic activity of the vastus lateralis were recorded. Across sets, movement velocity at the 5th and the 6th repetitions was higher ($p < 0.05$) with the cluster sets than with the continuous sets during the concentric phase and lower (p 0.05) from set to and from repetition to repetition and did not differ ($p > 0.05$) between the two sessions. It appears that the use of cluster sets allows the preservation of higher movement velocities during a speed-strength session using submaximal loads than the use of continuous sets although no differences are observed in the neuromuscular activation. Therefore, cluster sets may be the preferred set structure to use for long term development of speed-strength.

Keywords: resistance exercise, neuromuscular activation.

EVALUATION OF TRAINING LOAD AND PHYSICAL PERFORMANCE OF POM CHEERLEADING ATHLETES DURING A PRE-COMPETITION MICROCYCLE

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The purpose of the present study was to evaluate the training load and physical performance of junior-level pom cheerleading athletes during a pre-competition microcycle. A total of 21 pom cheerleading athletes participated voluntarily in the study (age: 13.68 ± 1.58 years, body mass: 52.82 ± 10.33 kg, height: 157.57 ± 7.30 cm, VO_2max: 44.22 ± 5.48 ml/kg/min), competing in the junior category and having at least three years of training experience. Measurements were conducted during a pre-competition microcycle and included anthropometric characteristics and body composition, cardiorespiratory endurance assessed via the 20 m progressive shuttle run test, 20 m sprint speed, and jumping ability (squat jump, CMJ). Additionally, during each training session of the microcycle, heart rate (Team Polar II), energy expenditure (kcal), and rating of perceived exertion (RPE) using the 10-point Borg scale were recorded. Training impulse (TRIMP) was calculated using the Banister model, as well as session RPE (sRPE = RPE × training session duration). Data analysis showed statistically significant differences between training sessions in HRmax [$F(3,51)=3.833$, $p<0.05$, $\eta^2=0.184$], sRPE [$F(3,51)=6.318$, $p<0.001$, $\eta^2=0.271$], and energy expenditure [$F(3,51)=3.833$, $p<0.05$, $\eta^2=0.184$]. However, no statistically significant effect of training load was observed, which remained at low levels (48 to 51). In the CMJ test, statistically significant differences were observed in flight time ($p<0.05$) and jump height ($p<0.05$), as well as in 20 m sprint performance ($p<0.001$), after the end of the microcycle. These findings indicate that the training load during the pre-competition microcycle remained low and relatively stable, without inducing significant overall adaptations. Although variations were observed between training sessions (in heart rate, fatigue, and energy expenditure), these were not sufficient to substantially affect the overall training load. Improvements were observed in specific performance parameters, such as 20 m sprint speed and explosive power (CMJ jump). These results suggest that even a low training load can have a positive effect on young athletes, likely due to their developmental stage and physiological adaptability. For greater performance enhancement, better regulation and a progressive increase in the training load are recommended in future training plans.

Keywords: cheerleading, training Impulse, sRPE, physical performance, microcycle

FUNCTIONAL ADAPTATIONS FOLLOWING A COMBINED CIRCUIT TRAINING AND MAT PILATES PROGRAM IN POSTMENOPAUSAL WOMEN

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Menopause is a natural biological process in a woman's life, associated with various physical and psychological changes that may compromise functional capacity. This study aimed to investigate the effects of combined circuit training and Mat Pilates on physical abilities and motor skills that contribute to functionality in postmenopausal women. The sample consisted of twelve postmenopausal women who had experienced at least 12 months of amenorrhea (age: 58.42±5.17 yrs, BMI: 25.57 ±4.92 kg/m²) and participated voluntarily. Functional capacity parameters, such as strength, flexibility, balance, and endurance, were assessed with the Senior Fitness Test, which included the Arm Curl Test, Chair Sit and Reach Test, Back Scratch Test, 8-Foot Up and Go Test, and Step-in-Place Test.Additionally, isometric upper limb strength was measured witha digital hand dynamometer (K-Force, KINVENT).Assessments were conducted at baseline and post-intervention. An eight-week training intervention was implemented, consisting of three sessions per week, each lasting 60 minutes. The program combined two types of exercise, including one weekly Mat Pilates session performed with a mini ball and two moderate-intensity circuit training sessions that incorporated ten whole-body exercises with intensity and volume progressively increased throughout the intervention. Data analysis was performed using a paired samples t-test. A statistically significant improvement was observed in the Step-in-Place Test $t(11)=-3.98$, $p<0.01$ and the Chair Sit and Reach Test $t(11)=-3.39$, $p<0.01$, while the remaining functional capacity tests showed a positive trend, although the changes were not statistically significant($p>0.05$). The eight-week combined circuit training and Mat Pilates program led to improvements in lower-body endurance and flexibility, which can contribute to enhanced mobility and the ability to perform daily activities with less fatigue in postmenopausal women. However, a longer exercise intervention may be required to elicit more pronounced improvements across all functional capacity parameters in this population.

Keywords: Menopause, Strength, Flexibility, Balance, Endurance, Exercise

HEMODYNAMIC AND CARDIOVASCULAR RESPONSES DURING THE EXECUTION OF A REPEATED ISOMETRIC UPPER-LIMB EXERCISE PROTOCOL IN WHEELCHAIR BASKETBALL ATHLETES

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Isometric (static) muscle contraction increases intramuscular pressure and imposes significant stress on the cardiovascular system, constituting an important tool in both rehabilitation and adapted exercise for individuals with physical disabilities. The purpose of the present study was to monitor and investigate hemodynamic and cardiovascular responses during the execution of a repeated isometric upper-limb exercise protocol in wheelchair basketball athletes. Ten (n = 10) wheelchair basketball athletes, classified as category A1, participated in the study (mean age: 39.4±8.1years; mean training experience: 12.0±7.6 years). The protocol consisted of isometric activation of the dominant upper limb (elbow flexion at 90°) using a 3.6 kg dumbbell. Specifically, participants performed three isometric sets of 2 minutes each (3×2 min), with a 1-minute passive rest interval between sets. Hemodynamic and cardiovascular variables were continuously recorded using a non-invasive monitoring system (Finapres Nova Plus). Hemodynamic variables included systolic and diastolic blood pressure (SYS, DIA), total peripheral resistance (TPR), diastolic pressure-time index (DPTI), and rate-pressure product (RPP). Cardiovascular variables included heart rate (HR), stroke volume (SV), and cardiac output (CO). Repeated measures ANOVA revealed a statistically significant main effect of time/condition on hemodynamic variables. Specifically, significant changes were observed in DIA [$F(10, 90) = 16.554$, $p < 0.001$], SYS [$F(10, 90) = 16.042$, $p < 0.001$], RPP [$F(10, 90) = 13.064$, $p < 0.001$], DPTI [$F(10, 90) = 4.0215$, $p < 0.001$], and TPR [$F(10, 90) = 3.7956$, $p<0.001$]. These findings indicate that the observed changes in these hemodynamic parameters are systematic and not attributable to random variation. In conclusion, it is noteworthy that no previous studies have continuously monitored isometric contractions in wheelchair basketball athletes. Repeated upper-limb isometric sets elicit significant hemodynamic and mild cardiovascular responses in this population. These findings highlight the importance of exercise volume and structure in designing safe and effective training and rehabilitation programs for individuals with physical disabilities.

Keywords: Finapres Nova, isometric exercise, hemodynamic indices, wheelchair basketball

HEMODYNAMIC RESPONSES DURING INTERVAL EXERCISE OF DIFFERENT REPETITION DURATIONS BUT OF EQUAL TOTAL EXPENDITURE OF THE FINITE WORK CAPACITY

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Interval training is executed at intensities above critical power and improves endurance performance partly by hemodynamic adaptations in heart rate (HR), stroke volume (SV), and cardiac output (CO). When a test is conducted to determine critical power, the finite work capacity (W') is also determined. W' denotes the amount of work that can be performed until fatigue occurs when a person exercises at an intensity higher than the critical power. W' can be used to design interval training programs where exercise and rest durations are determined based on its consumption and recovery. The purpose this research was to examine the hemodynamic responses of two interval training sessions of different repetition durations and W' depletion per repetition but of equal total W' depletion at the end of the training sessions. Fourteen subjects (22.5±4.6 yrs) executed two training sessions. At both training sessions, the intensity of the repetitions was set at 110% of the maximum aerobic power. At the first session four repetitions were performed so that at the end of each repetition 40% of W' was spent while at the other session eight repetitions were performed so that at the end of each repetition 20% of W' was spent. Rest duration was such that at the end of the four (1st training session) and the eight (2nd training session) repetitions 10% of W' was left. As a result of the consumption of W' during the repetitions and its reconstitution during the rest periods, a total of 150% of W' was spent at each session. HR, SV and CO were continuously recorded during the two sessions. The mean values of HR, SV and CO during the exercise and the rest phases did not differ ($p > 0.05$) between the two sessions. HR and CO increased ($p < 0.05$) progressively from repetition to repetition both at the exercise and the rest phases. It appears that the duration of the repetitions during and interval training session, designed based on W' consumption and restoration, does not differation heart rate, stroke volume and cardiac output responses providing a similar stimulus to the cardiovascular system.

Keywords: Hemodynamics,Interval training,Aerobic exercise,Finite Work Capacity,Stroke Volume,Cardiac Output

HOW DO CYCLE ERGOMETER PROTOCOLS INFLUENCE THE ASSESSMENT OF MAXIMAL FAT OXIDATION IN OBESE ADULTS? A SCOPING REVIEW

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Maximal fat oxidation (MFO) and the exercise intensity at which it occurs (Fatmax) are widely used indicators of metabolic flexibility and substrate utilization during exercise. However, substantial methodological variability exists in the protocols used to assess Fatmax in obese populations, which complicates comparisons across studies and the practical application of these measurements in exercise prescription. The aim of this scoping review was to synthesize current evidence regarding cycle ergometer protocols used to determine MFO and Fatmax in obese adults and to identify physiological and methodological factors influencing fat oxidation responses. A systematic search of the literature identified studies investigating fat oxidation during graded cycling protocols in overweight or obese individuals. Twenty-three studies met the inclusion criteria and were analyzed. The reviewed studies showed considerable heterogeneity in protocol design; however, most protocols implemented lower initial workloads, smaller workload increments, and longer stage durations compared with those typically used in trained populations. Fatmax in obese adults was generally observed at approximately 30–50% of VO_2peak, indicating a shift of the fat oxidation curve toward lower exercise intensities. Importantly, cardiorespiratory fitness appeared to influence fat oxidation capacity more strongly than adiposity itself, suggesting that reduced fitness rather than excess body mass may partly explain impaired fat oxidation in obesity. Additional factors such as sex, developmental stage, insulin resistance, and type 2 diabetes were also reported to modulate fat oxidation responses. Exercise-based interventions, including moderate-intensity continuous training, high-intensity interval training, and Fatmax-targeted exercise, consistently increased MFO and shifted Fatmax toward higher intensities, indicating improvements in metabolic flexibility. In contrast, dietary and supplementation strategies demonstrated limited additional effects. Overall, these findings indicate the importance of appropriate protocol design when assessing Fatmax in obese individuals and support the role of structured exercise interventions for improving fat oxidation capacity and metabolic health in this population.

Keywords: Fatmax,maximal fat oxidation,obesity,cycle ergometer,metabolic flexibility

MUSCLE STRENGTHENING IN A PEDIATRIC PATIENT WITH CONGENITAL MYOPATHY WITH A VARIATION IN THE RYR1 GENE.

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Congenital myopathies are a heterogeneous group of genetic muscle disorders characterized by muscle weakness and functional limitations. Mutations in the RYR1 gene are a common cause of the condition, which is characterized by muscle weakness, hypotonia, severe motor delay, respiratory insufficiency, and skeletal deformities. The aim of the present study was to investigate whether an intervention program focused on muscle strengthening would result in improvements in upper and lower limb strength in a 9-year-old girl with congenital myopathy. Prior to the intervention, two baseline assessments were performed. Subsequently, a 10-week muscle strengthening program was implemented, with a frequency of three sessions per week. The program included exercises for the upper and lower limbs as well as the core, personalized to the participant's muscle weaknesses and motor limitations, with the aim of improving basic functional movements of daily living. During the intervention, reassessments were conducted at weeks 5 and 10. After completing the program, two additional follow-up measurements were performed, at 2 and 4 weeks with the patient abstaining from muscle strengthening programs. The following tests were used for evaluation: "timed up and go test," "sit-to-stand 5 and 10 repetitions", "climbing 10 stairs," "elbow flexion with a 0.5 kg dumbbell in each hand," and "elbow extension from a standing position with 5 kg resistance". The results demonstrated improvements across all assessment tests. Specifically, functional percentage improvements were observed as follows: 30.8% in the "timed up and go" test, 38.1% in the "5-repetition sit-to-stand," 44.5% in the "10-repetition sit-to-stand," 39.5% in "climbing 10 stairs," 50% in "elbow flexion," and 50% in "elbow extension." After 4 weeks of detraining, performance remained improved compared to baseline by 26.1%, 36.7%, 40.1%, 38.5%, 33.3%, and 30%, respectively. Based on these findings, it can be concluded that the 10-week muscle strengthening program had a positive functional effect on the participant, as improvements were observed in daily movement activities, contributing to an enhanced quality of life.

Keywords: congenital myopathy, muscle strengthening, pediatric patient,functional assessment.

SECONTARY VASCULAR PARKINSONISM

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Secondary Vascular Parkinsonism (VP) is a form of secondary parkinsonism characterized primarily by lower body motor impairment and limited responsiveness to dopaminergic medication due to postsynaptic damage, highlighting the need for effective non-pharmacological interventions. The purpose of this study was to investigate the effects of a structured exercise-based rehabilitation program on functional mobility, balance, and aerobic capacity in patients with VP. A total of 3 participants 3 females; mean age:72 ± 4.5 years; mean weight: 78 ± 10 kg; mean height: 1.68 ± 0.08 m diagnosed with VP were included. Functional assessment was conducted using the Timed Up and Go (TUG), Berg Balance Scale (BBS), 6-Minute Walk Test (6MWT), and dual-task performance tests, administered at baseline and after completion of the intervention (2 assessments in total). The rehabilitation program consisted of 3 sessions per week over a period of 8 weeks, with each session lasting 45-60 minutes. Training included aerobic exercise, resistance training, and task-specific gait training using visual and auditory cues to facilitate motor control, with 3-minute rest intervals between sets and exercises. Throughout the 8-week intervention, all participants maintained hemodynamic stability while also adhering to the safety protocol. Outcome measures showed significant improvements in balance (BBS), dynamic mobility (TUG), and aerobic endurance (6MWT). The results underscore the potential of targeted rehabilitation to bypass basal ganglia dysfunction through sensory cues, offering a powerful therapeutic strategy for managing the complex motor deficits of vascular parkinsonism. It should be noted that this study is based on a small sample size and, therefore, the findings should be considered preliminary (pilot in nature).

Keywords: Vascular Parkinsonism, Neurorehabilitation, Therapeutic Exercise, Gait Control, Sensory Cues.

NON-PHARMACOLOGICAL MANAGEMENT OF HYPERTENSION THROUGH REFORMER PILATES IN A POSTMENOPAUSAL WOMAN: A CASE STUDY

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The postmenopausal period represents a critical phase in a woman's life, as it is associated with hormonal changes linked to increased cardiovascular risk and the onset or exacerbation of arterial hypertension. Regular physical activity is widely recognized as a key non-pharmacological intervention for the prevention and management of cardiovascular disorders. The aim of this case study was to investigate the effects of a structured Reformer Pilates program on hemodynamic parameters in a postmenopausal woman with uncontrolled hypertension, without pharmacological treatment. The participant was a 65-year-old postmenopausal woman (83 kg, 155 cm), six years after menopause, with undiagnosed stage 2 hypertension. Baseline assessment revealed elevated blood pressure (167/103 mmHg) and resting heart rate (81 bpm). The exercise intervention lasted five weeks, with a frequency of three sessions per week (50 minutes per session), and included Reformer Pilates exercises with progressive loading. Measurements were conducted at six time points throughout the intervention, both at rest and during a 2-minute wall-sit test (isometric contraction of lower limb muscles), using a non-invasive continuous monitoring system (Finapres Nova Plus). The recorded variables included SYS, DIA, HR, SV, DPTI, and RPP. The results demonstrated significant improvements in hemodynamic parameters as early as the first week, both at rest [SYS: 186→148 mmHg, DIA: 99→89 mmHg, TPR: 1.09®0.50 mmHg·s/ml, DPTI: 62.0®37.0 mmHg·s, RPP: 11156®7641] and during the wall-sit test [SYS: 246®186 mmHg, DIA: 150®122 mmHg, TPR: 2.45®0.91 mmHg·s/ml, DPTI: 81.0®46.0 mmHg·s, RPP: 19064®12602]. Positive adaptations continued throughout the five-week intervention, although at a reduced rate of improvement. In conclusion, structured Reformer Pilates appears to be an effective non-pharmacological intervention for improving hemodynamic function and managing arterial hypertension in postmenopausal women, contributing to overall cardiovascular health and physical fitness.

Keywords: postmenopause, hypertension, Reformer Pilates, hemodynamic parameters, non-pharmacological intervention

PULMONARY FUNCTION RESPONSES DURING INSPIRATORY MUSCLE TRAINING IN PATIENTS WITH CHRONIC HEART FAILURE. A SYSTEMATIC REVIEW AND METANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Exercise intolerance and reduced functional capacity are common symptoms of heart failure, often associated with reduced pulmonary function. Cardiac rehabilitation has been established as standard care for patients with chronic heart failure (CHF) to improve cardiovascular function and skeletal muscle strength Bragazzi et al. (2019). Breathing exercise, including inspiratory muscle training (IMT) has been shown to reduce dyspnea and alleviate respiratory symptoms Bozkurt et al. (2021) in patients with pulmonary and cardiac disease. Studies that incorporated IMT in cardiac rehabilitation have observed improvement in respiratory function and overall exercise capacity Ammous et al. (2023), indicating IMT as a complementary treatment to reduce respiratory disorders. However, it remains unclear whether isolated IMT might improve respiratory muscle strength and pulmonary function in patients with CHF. The purpose of this systematic review is to assess the impact of IMT on maximal inspiratory pressure (Pimax), diaphragm thickness, functional vital capacity and maximum oxygen uptake (VO2peak) in patients with CHF. The meta-analysis was conducted in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Thirteen randomized controlled trials met the inclusion criteria. More of the studies (11) clearly indicate an increase in respiratory muscle strength and improvement on Pimax after (p=0.002) IMT. Functional vital capacity was also improved in 5 studies (p=0.03). Moreover, in 6 studies VO2peak assessed by cardiopulmonary exercise testing before and after IMT showed statistically significance (p=0.04) in patients with CHF compared to controls. Improvement in sympathetic and parasympathetic regulation of the cardiovascular system, increase in skeletal muscle perfusion and endothelial function, improved oxygen metabolism and reduced lung congestion during IMT may all contribute to these changes. The metanalysis indicate that isolated IMT performed either as short term intervention (4 months) of high intensity (40 to 60% Pimax) or long term programme (6 to 12 months) of low intensity (30% Pimax) promotes pulmonary responses and improves prognosis of CHF. More studies are required to examine the impact of IMT on diaphragm thickness in patients with chronic heart failure.

Keywords: Inspiratory Muscle Training, Diaphragm Thickness, Maximum Inspiratory Pressure, Functional Capacity, Maximum Oxygen Uptake

REFORMER PILATES AND PHARMACOLOGICAL TREATMENT ON CARDIOVASCULAR INDICATORS IN A POSTMENOPAUSAL WOMAN: A CASE STUDY

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The postmenopausal period is associated with an increased cardiovascular risk, particularly in women with uncontrolled hypertension. The present case study examines the combined effects of a Reformer Pilates exercise program and the initiation of antihypertensive pharmacological treatment on key cardiovascular indicators. The participant was a 59-year-old postmenopausal woman (weight: 59 kg, height: 162 cm), six years post-menopause, with previously undiagnosed stage 2 hypertension and no prior pharmacological management. Baseline assessment revealed elevated blood pressure (167/103 mmHg), increased resting heart rate (81 bpm), and indications of elevated cardiovascular load. The exercise intervention lasted five weeks, with a frequency of three sessions per week (50 minutes per session), consisting of Reformer Pilates exercises with progressive overload. Concurrently, antihypertensive medication was initiated during the second week under medical supervision. Measurements were taken at baseline, at 3 weeks, and post-intervention using a non-invasive continuous monitoring system (Finapres Nova Plus). The assessed variables included systolic blood pressure (SYS), diastolic blood pressure (DIA), heart rate (HR), stroke volume (SV), diastolic pressure-time index (DPTI), and rate-pressure product (RPP). Repeated measures ANOVA indicated a statistically significant effect of time on most variables: HR [$F(2,8)=25.976$, $p=0.00032$], DIA [$F(2,8)=11.150$, $p=0.00486$], SYS [$F(2,8)=10.973$, $p=0.00509$], SV [$F(2,8)=9.9807$, $p=0.00670$], DPTI [$F(2,8)=5.1963$, $p=0.03579$], and RPP [$F(2,8)=4.4572$, $p=0.05004$]. The combined intervention of exercise and pharmacological treatment appears to significantly improve cardiovascular indicators, contributing to enhanced cardiac function and more effective blood pressure control. These findings highlight the importance of an integrated approach for the optimal management of hypertension in postmenopausal women.

Keywords: reformer pilates, hypertension, postmenopausal women, Finapres Nova

REHABILITATION OF DYSFACTIONAL BREATHING THROUGH EXERCISE AND BREATHING RETRAINING: A CASE STUDY

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Dysfunctional breathing is a common condition characterized by inefficient breathing patterns and is associated with dyspnea, fatigue, and reduced functional capacity. Literature evidence suggests that non-pharmacological interventions, such as respiratory training, particularly diaphragmatic breathing, can improve breath control, functional performance, and quality of life in individuals with this disorder. Moreover, structured exercise programs contribute to the restoration of normal breathing patterns in patients with dysfunctional breathing. The present study aimed to evaluate a rehabilitation program combining exercise and breathing retraining in an elderly patient with dysfunctional breathing, integrated within the Rehabilitation and Exercise Spirometry Clinic of the 1st K.E.TH. – Evangelismos General Hospital, Athens, Greece. The participant was a 63-year-old male with a body weight of 83 kg, height of 170 cm, and body mass index of 28.7 kg/m². He was enrolled in the program due to dyspnea at rest and after walking 2–3 km, experiencing breathlessness and a frequent need for deep inhalations during exertion, accompanied by a sensation of insufficient inspired air. Anthropometric data and smoking history were collected, while resting spirometry, cardiopulmonary exercise testing on a cycle ergometer, and assessments using dyspnea and psychometric questionnaires (HADS, Breath-VQ, and Nijmegen Questionnaire) were conducted. Data analysis demonstrated overall improvement following the intervention, with reductions in dyspnea (33,7%) and fatigue (104%), as well as improvements in respiratory function tests and questionnaire scores (HADS 30%, Nijmegen questionnaire 26%, Breath-VQ 13,3% %). Cardiopulmonary exercise testing indicated complete restoration of the breathing pattern, a 16% increase in peak aerobic capacity (VO_2peak), and a 52% improvement in the anaerobic threshold. These findings suggest that a combined exercise and respiratory retraining intervention can improve dyspnea, fatigue, and respiratory function indices, contributing to the correction of dysfunctional breathing and enhancing quality of life in an elderly patient.

Keywords: dyspnea, dysfunctional breathing, respiratory retraining, exercise program, cardiopulmonary exercise testing

RELATIONSHIP BETWEEN MUSCLE AND BRAIN OXYGENATION INDEXES WITH ENDURANCE TIMES TO EXHAUSTION

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The purpose of this research was to examine the correlation between time to exhaustion at different intensity levels, specifically 85%, 100%, and 115% of maximal aerobic power (MAP) and the rate of change and the range of change of oxygenated hemoglobin (O_2Hb), deoxygenated hemoglobin (HHb), total hemoglobin (tHb), and tissue saturation index (TSI) in the prefrontal cortex and the vastus lateralis muscle. Fourteen physically active students (7 males and 7 females; age of 21.40 ± 2.64 years) performed a maximal incremental test to exhaustion on a cycle ergometer to determine MAP. Afterwards, on three separate days, they cycled until exhaustion at intensity levels corresponding to 85%, 100%, and 115% of MAP. During these trials, O_2Hb, HHb, tHb and TSI changes at the prefrontal cortex and the vastus lateralis muscle were measured using near infrared spectroscopy. With subsequent analyses the range of changes and the slope (rate) of changes of the NIRS parameters during the trials were determined. Endurance time at 85% of MAP correlated only with tHb range of change at the prefrontal cortex (r= 0.529, p= 0.077). Endurance time at 100% of MAP correlated with the range (r= -0.563, p= 0.036) and the rate of change of O_2Hb (r= -0.559, p= 0.038), with the range (r= -0.602, p= 0.023) and the rate of change of tHb (r= -0.611, p= 0.02), and the rate of change of HHb (r= -0.502, p= 0.067) of the vastus lateralis muscle. Endurance time at 115% of MAP correlated with the range of change of TSI (r= 0.497, p= 0.071) at the vastus lateralis muscle, as well as with the range of change of HHb (r= 0.727, p= 0.003) and TSI at the prefrontal cortex (r= 0.478, p= 0.084). The above data show that a slower decrease in muscle oxygen availability and of O2 extraction is positively correlated with endurance time at 100% of MAP (range: 264-395 sec). At higher intensities (115% of MAP), a greater O2 extraction at prefrontal cortex and O2 desaturation both at prefrontal cortex and at the muscular level are related with increased time to exhaustion (range: 130 – 264 sec).

Keywords: aerobic speed, fatigue test, endurance levels, near-infrared spectroscopy, NIRS

SELF-REPORTED PHYSICAL FITNESS: A STUDY AMONG PHYSICAL EDUCATION STUDENTS

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The assessment of physical fitness is a key factor in promoting health and preventing chronic diseases. In recent years, self-reported physical fitness questionnaires have emerged as practical and cost-effective tools for data collection in large populations, without the need for specialized equipment or laboratory measurements. The aim of the present study was to investigate the reliability and validity of a self-reported questionnaire (very poor: 1, poor: 2, moderate: 3, good: 4, very good: 5) for assessing physical fitness in first-year students of the Department of Physical Education and Sport Science in Komotini. Participants included male (n=88, BMI: 24.2, WHR: 0.82) and female students (n=66, BMI: 22.8, WHR: 0.75), who completed the questionnaire by subjectively evaluating parameters such as aerobic capacity, muscular strength, flexibility, agility, and overall physical fitness. Subsequently, objective health and fitness indicators were assessed using standardized field tests. The same questionnaire was re-administered following the completion of the testing procedures. The results showed significant changes in responses, mainly among male students, in overall physical fitness (3.8→4.4), muscular strength (3.5→3.8), and agility (3.6→3.9). Female students demonstrated changes primarily in flexibility (3.4→3.7). In conclusion, the self-reported physical fitness questionnaire appears to be a reliable and practical tool for assessing physical fitness, particularly in settings where objective measurements are not feasible.

Keywords: self-reported questionnaire,physical fitness,young population

THE EFFECT OF 10-WEEK INTEGRATIVE NEUROMUSCULAR TRAINING ON VERTICAL JUMP, CHANGE OF DIRECTION ABILITY AND SPRINT IN VOLEYBALL ATHLETES 12-14 YEARS OLD

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Email: panoskatsig7@gmail.com Integrative neuromuscular training (INT) training refers to a method that integrates different types of physical exercise or sports skills into one program. Its purpose is to develop multiple fundamental motor skills such as strength, change of direction ability and speed, and improve overall athletic performance. The purpose of the present study was to investigate the effect of 10 weeks of INT training on vertical jump, change of direction ability and speed of young female volleyball players. The sample consisted of 43 healthy female volleyball players, aged 12-14 years, of which 21 constituted the experimental group and 22 the control group. The athletes had a training age of at least 1 year and were systematically trained 3 times a week. The experimental group executed for 10 weeks, 3 times a week, a periodized INT training program that involved core strengthening exercises like planks and sit ups, exercises for the lower limbs such as lunges, half squats, counter movement and drop jumps. All these exercises had a progression in their difficulty from the first until the last week of the training program. The INT training was followed by tactical volleyball training of 40-45 minutes duration. The control group followed a typical volleyball training program. Before and after the intervention program performances at 10m sprint, counter movement jump (CMJ), 5-0-5mod, and T-test mod were evaluated. CMJ increased ($p < 0.05$) at both groups, but the experimental group showed a greater improvement. 10m sprint and T-test performance improved in the experimental group ($p < 0.001$) whereas in decreased in the control group. Regarding the 5-0-5mod test, significant improvements were observed in the experimental group both for the left ($p = .002$) and the right directions ($p < 0.001$), while a decline was observed in the control group both for the left ($p = 0.002$) and the right ($p = .046$) direction. The above results show that an INT training intervention can lead to great improvements in vertical jump, speed, and change of direction ability. Therefore, INT training seems to be an effective method to improve the fundamental motor skills of young female athletes in a short period of time.

Keywords: integrative training, young female, volleyball, jump, sprint, change of direction

THE EFFECT OF OBESITY LEVEL ON GLYCEMIC RESPONSE FOLLOWING AEROBIC EXERCISE AT FATMAX INTENSITY OF 20 AND 30 MINUTES IN YOUNG MEN

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Obesity is a global pandemic closely associated with insulin resistance and impaired glucose homeostasis. Although aerobic exercise performed at the intensity of maximal fat oxidation (Fatmax) has been shown to enhance metabolic flexibility, the interaction between exercise duration and the degree of obesity in relation to glycaemic response remains unclear. Therefore, the aim of the present study was to investigate the effect of obesity level on glycaemic response during aerobic exercise performed on a cycle ergometer at Fatmax intensity, with durations of 20 and 30 minutes, in young men. The sample consisted of 21 young men (aged 24.78±3.49 yrs, body mass 96.55±29.06 kg, height 179.62±7.44 cm, BMI 29.70±7.96 kg/m2, body fat 25.2±9.83%) classified according to their degree of obesity (normal weight n=7, overweight n=8, obese n=6). Participants initially performed a graded exercise test on a cycle ergometer to determine maximal oxygen consumption (VO_2max) and individual Fatmax intensity using indirect calorimetry. Each participant then completed two randomized experimental sessions: a 20-minute and a 30-minute exercise protocol at Fatmax intensity. Each session consisted of two exercise bouts separated by 10 minutes of passive recovery. Blood glucose concentrations were measured at five time points: at baseline, after the first exercise bout, after the first recovery period, after the second exercise bout, and after the second recovery period. Data analysis revealed a statistically significant effect of time on fat oxidation rates [$F(4,144)=7.736$, $p<0.001$, $\eta^2=.290$] and glucose concentrations [$F(4,144)=7.736$, $p<0.001$, $\eta=.290$]. A statistically significant effect of obesity level was also observed on fat oxidation [$F(2,36)=3.695$, $p<0.05$, $\eta^2=.170$], while no significant differences were found between the two exercise durations ($p>0.05$). The findings of the present study indicate that aerobic exercise performed at Fatmax intensity elicits significant changes in both fat oxidation and glycemic response over time, regardless of exercise duration. Specifically, glucose concentrations varied significantly across measurement time points, suggesting that Fatmax exercise induces acute metabolic adaptations that influence glycemic regulation. Furthermore, the degree of obesity appears to affect fat oxidation capacity, with significant differences observed between groups. This finding supports the notion that metabolic flexibility is influenced by body composition and adiposity levels.

Keywords: glucose, maximal fat oxidation, obesity, cycle ergometer, metabolic flexibility

THE EFFECT OF PLYOMETRIC TRAINING WITH AND WITHOUT EXTERNAL LOAD ON JUMPING ABILITY AND SPRINT PERFORMANCE OF ADOLESCENT ATHLETES AGED 16–17

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Lower-limb speed-strength constitutes a fundamental component of athletic performance in sports that require jumping ability, rapid changes of direction, sprinting speed and accelerations were the start phase playing a decisive role in overall performance. Plyometric training has been recognized as one of the most effective methods for developing speed-strength; however, it remains unclear whether its application with external load is superior to the traditional unloaded form in adolescent athletes.The aim of the present study was to compare the effects of plyometric training with and without external load on the improvement of vertical jump and sprint performance in adolescent athletes aged 16-17 years. The sample consisted of ten well-trained young track and field athletes who participated in two six week interventions , separated by a 4- week de-loaded period. Sprint performance (10m and 30m), jumping ability (squat jump,countermovement jump and dromp jump height, contact time and reactive strenght index), and leg press maximal strenght (1RM) were measured before and after each intervention. Each program involved two 2 sessions per week including plyometric and sprint training. The plyometric exercises at the 1st program were 2-4 sets of 10 repetitions of dromp jumps from 20cm, and 3-4 x 4box jumps with both and single leg.The plyometrics exercises at the 2nd program were 2 sets of 8 repetitions of jump squats with loads 20-40% of body mass,2-4 sets of 6-8 repetitions scissor jumps holding weights of 4-8kg, 2-4 sets of 6-8 repetitions single leg jumps holding weights of 4-8kg. At both training programs, after the jump exercise 2-3 x 20-50m sprints were performed. The plyometric program with external loads lead to greater ($p<0.05$) improvements in 30m sprint time, leg press 1RM, and squat and countermovement jump height. No differences ($p>0.05$) between the two training programs were observed in 10m sprint time and drop jump height and reactive strenght index. In conclusion, plyometric training with external loads appears to induce superior adaptations in speed-strenght and sprint performance, representing a highly effective training strategy for enhancing performance in adolescent athletes.

Keywords: plyometric training, explosive power, sprint performance, acceleration, adolescent athletes

THE EFFECT OF REPETITION DURATION ON MUSCLE AND CEREBRAL OXYGENATION DURING INTERVAL EXERCISE WITH EQUAL TOTAL USAGE OF THE FINITE WORK CAPACITY

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Interval exercise is one of the most widely used training modalities for the improvement of aerobic capacity. However, the effect of repetition duration on local muscle and cerebral oxygenation remains unclear, particularly when the total use of the finite work capacity is the same. Therefore, this study examined the effects of two repetition durations on vastus lateralis (VL) muscle and prefrontal cortex (PFC) oxygenation during interval exercise when, however, total use of the finite work capacity is equal. Fourteen healthy, physically active participants (7 men and 7 women, age: 27.5 ± 8.5 years) executed two interval training sessions at an intensity 110% of the maximum aerobic power. At the first session four repetitions were performed so that at the end of each repetition 40% of W' was spent while at the other session eight repetitions were performed so that at the end of each repetition 20% of W' was spent. Rest duration was such that at the end of the four (1st training session) and the eight (2nd training session) repetitions 10% of W' was left. As a result of the consumption of W' during the repetitions and its reconstitution during the rest periods, a total of 150% of W' was spent at each session. VL and PFC oxygenation were assessed using near-infrared spectroscopy by measuring tissue saturation index (TSI), oxygenated hemoglobin (O2Hb), deoxygenated hemoglobin (HHb), and total hemoglobin (tHb). The mean values of TSI, O2Hb, tHb, and HHb both at vastus lateralis and prefrontal cortex did not differ ($p>0.05$) between the two training sessions. The range of changes of TSI, O2Hb and HHb were lower ($p>0.05$) at the 8-repetition session both at VL and the PFC while tHb range of change was lower at the 8-repetition protocol only at the VL muscle. In conclusion, repetition duration does not appear to differentiate the changes in muscle oxygenation levels although with a shorter duration there is a lower return to initial values. The achievement of a similar total depletion of finite work capacity appears to be a decisive factor for muscle and brain oxygenation changes during aerobic interval exercise.

Keywords: interval exercise,muscle oxygenation,cerebral oxygenation,W',near-infrared spectroscopy

THE EFFECT OF TRAINING LOAD ON SLEEP VARIABLES IN SEMI-PROFESSIONAL SOCCER PLAYERS

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This study aimed to investigate the effect of training load on sleep variables in semi-professional soccer players. The sample consisted of 16 male soccer athletes (22.75 ± 5.2 years) with a playing experience of 16.3 ± 4.7 years. Training load was recorded using GPS technology, while sleep assessment was conducted using the Pittsburgh Sleep Quality Index (PSQI) at baseline and the Consensus Sleep Diary (CSD) on a daily basis. Measurements were carried out twice per week over an eight-week period, following training sessions of both high and low training load. Paired-samples t-test analysis revealed that the Rate of Perceived Exertion (RPE) was significantly higher during high-load training sessions (7.9 ± 0.8) compared to low-load sessions (6.4 ± 1.1) ($p < 0.001$), as well as across all other training parameters, including total distance covered (4216.9m vs 1825.9m $p < 0.001$), high-speed distance (267.6m vs 35.5m $p < 0.001$), sprint distance (97m vs 9.4m $p < 0.001$), maximum speed (27.4km/h vs 22.1km/h $p < 0.001$), number of sprints (4.84 vs 0.66 $p < 0.001$), and energy expenditure (523.7kcal vs 227.7kcal p 0.05), even when controlling for potential confounding factors such as stress levels, caffeine and alcohol consumption, and daily screen time. In conclusion, the findings suggest that despite the differences in training load between the two types of training days, their impact on sleep parameters was not statistically significant. These results highlight the need for further research involving larger samples and considering additional confounding variables, in order to better determine potential relationships and interactions between training load and sleep in athletes.

Keywords: training load,soccer players,sleep quality,sleep duration,sleep efficiency

THE ROLE OF BIOLOGICAL MATURATION IN GENDER DIFFERENCES IN ANTHROPOMETRIC AND PHYSICAL PERFORMANCE TRAITS AMONG PREADOLESCENT TRACK AND FIELD ATHLETES

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Biological maturation and growth are key factors influencing the development of anthropometric characteristics and physical performance in young athletes, with differences in maturation often contributing to gender-related variations. Aim of this study was to investigate gender differences in anthropometric characteristics and physical performance among preadolescent athletes, and to explore the influence of biological maturation (years from peak height velocity-PHV) on these relationships. Thirty-one young track and field athletes (15 boys, 16 girls) with a mean age of 10.8 ± 0.96 years voluntarily participated in the study. The mean maturity offset from PHV was −2.5 ± 0.9 years for boys and −1.0 ± 1.0 years for girls (estimated by the Mirwald equation), while the participants presented a mean height of 147 ± 9.5 cm and a mean body mass of 39.9 ± 9.7 kg. Measurements included height, sitting height, weight, body mass index (BMI), static and dynamic balance, 20-m sprint, vertical and horizontal jumps, and medicine ball throw. Statistical analyses involved independent t-tests, Mann–Whitney U tests, Spearman correlations, and analysis of covariance (ANCOVA). Initial tests showed no significant gender differences in any parameter ($p > .05$). However, when biological age was included as a covariate in ANCOVA models, significant gender effects emerged for all anthropometric traits (height, weight, BMI; p .05 for jumps, sprint, and agility), nor did it reveal any underlying gender differences in these tests among the athletes. Spearman correlations confirmed that while biological age was strongly associated with physical growth (height: rho = .53, weight: rho = .48), its relationship with motor performance was weak and non-significant. Notably, BMI was the only anthropometric trait negatively correlated with agility performance (rho = -.43, $p = .015$). The findings suggest that biological maturation during the developmental stage is a major determinant of physical growth and sexual dimorphism, effectively masking gender-related anthropometric differences. In contrast, physical performance for both genders appears to be less dependent on biological maturation and more likely influenced by training-related adaptations and/or neuromuscular coordination.

Keywords: Biological maturation, developmental age, Peak Height Velocity (PHV), anthropometry, physical performance, Track and Field

ΠΡΟΠΟΝΗΤΙΚΗ ΑΤΟΜΙΚΩΝ ΑΘΛΗΜΑΤΩΝ

EXERCISE TRAINING/COACHING IN INDIVIDUAL SPORTS

AGE-RELATED DIFFEREENCES IN SELECTED PHYSICAL FITNESS INDICES BEWTEEN CHILDREN AND ADOLESCENT GRECO-ROMAN WRESTLERS

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Physical fitness plays a crucial role in the effective implementation of various skills in Greco-Roman wrestling, and its assessment helps guide the training process more effectively. Therefore, this study investigated the effect of age (children, adolescents) on selected physical fitness indices in boys' Greco-Roman wrestlers. Forty-four wrestlers: 22 children (age: 8-10 years old; body height: 126.9 ± 5.4 cm; body mass: 28 ± 6.2 kg) and 22 adolescents (age: 12-14 years old; body height: 145.5 ± 9.5 cm; body mass: 44.9 ± 9.4 kg) participated in the present study. Flexibility (using the sit and reach test), maximal handgrip strength of right and left hands (using the Kinvent hand dynamometer), power of lower and upper limbs (using the long jump test and the medicine ball pushing test, respectively), and reaction speed (using an upper limb reaction test) were assessed. Descriptive statistics, independent t-tests, and repeated measures analysis of variance were used to analyze the data. According to independent t-tests, adolescent wrestlers showed greater values compared to children ($p<0.001$) in the long jump test (children: 123 ± 21.5 cm; adolescents: 150 ± 18.3 cm), the medicine ball pushing test (children: 2.9 ± 0.4 m; adolescents: 4.3 ± 0.6 m) and the reaction speed test (children: 631 ± 85.6 ms; adolescents: 439 ± 62.3 ms); while, in sit and reach test no significant differences were observed between children and adolescents ($p>0.05$). Furthermore, the results of the present study reported significant differences ($p < 0.001$) in handgrip strength between children and adolescents, with adolescent wrestlers showing greater values compared to children in both hands. Regarding the hand-related differences in handgrip strength, the findings of the study demonstrated significant difference ($p=0.012$) between right and left hands in children (right: 15.4 ± 3.5 kg; left: 14.6 ± 3.1 kg), while no significant difference ($p=0.183$) between hands were observed in adolescent wrestlers (right: 23.3 ± 4.5 kg; left: 22.6 ± 3.6 kg). In conclusion, this study presents indicative values for evaluating selected physical fitness indices in young (children and adolescents) Greco-Roman wrestlers that could be used to design, implement, and guide effective training programs for performance enhancement.

Keywords: Physical Conditioning, Flexibility, Strength, Power, Reaction Speed, Measurement, Developmental Years

ANALYSIS OF KICKING AND HAND TECHNIQUE FREQUENCY IN THE NATIONAL SCHOOL TAEKWONDO WT CHAMPIONSHIP

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This study focuses on the analysis and evaluation of the frequency and effectiveness of kicking techniques performed during the National School Taekwondo WTF Championship, held at the indoor gymnasium in the Valley of Serres on May 15–16, 2024. The aim was to assess the performance of male and female high school athletes in terms of the kicking techniques they employed during competition. A total of 413 matches were analyzed — 204 involving female athletes and 209 involving male athletes from the first, second, and third grades of high school. All kicks (both scoring and non-scoring) executed in each bout were recorded. Descriptive statistical analysis was carried out using SPSS for Windows. The findings showed that the most frequently executed techniques were Baldeung Chagi and Yop Chagi, followed by other types of kicks in descending order of frequency. Although several techniques are capable of scoring points, athletes tend to rely on only a few of them. Statistically significant differences were observed in the application and effectiveness of certain techniques, offering valuable insights for designing individualized and gender-specific training programs. Enhancing the use of diverse kicking techniques could potentially improve athletic performance and competitive success in taekwondo.

Keywords: taekwondo, kicks, School National Championship

ASSESSMENT OF REACTION TIME AND MOVEMENT TIME OF MALE AND FEMALE SWIMMERS

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Reaction time (RT) in swimming, is defined as the interval between the starting signal and force application on the block. It is considered a critical, trainable, and age/gender-dependent factor that significantly impacts overall performance, especially in sprints. According to research findings men often show faster block reaction times than women. However, the term block reaction time is used as a synonymous to the term Total Response Time which includes both reaction time and movement time. Therefore, the purpose of the present study was to assess the Reaction Time (RT), Movement Time (MT) and Total Response Time (TRT) of male and female competitive Greek swimmers. A total of 18 athletes aged 18-22 years, 9 men and 9 women, participated in the study. Simple Reaction Time (SRT) and Choice Reaction Time (CRT) to a visual stimulus were assessed, as well as Discrimination Reaction Time (DRT) in a combination of visual and auditory stimuli. In addition, for all the above measurement conditions, MT and TRT were also recorded. For the evaluation of the SRT and the CRT, the Whole-Body Reaction Tester-1 (Takei and Co. Ltd) was used, and for the evaluation of the DRT, the RT/S3 test of the Vienna Test System (VTS 8) was used. Data analysis was performed with the statistical processing program Jamovi v. 2.6. To investigate the differences between male and female athletes in all the above-mentioned variables, the t-test for independent samples was applied. Statistically significant differences between male and female athletes were noted in the Movement Time, in the Simple reaction time, as well as in the Discrimination reaction time conditions, with male athletes outperforming female athletes. Although a number of factors, such as level of competition and expertise, relay vs. individual events are claimed to influence the overall block reaction times in swimming, the findings of the present study shifts the focus to improvable measures, such as Movement Time, through specific strength or/and power training and start training interventions based on Simple Reaction Time with different stimuli, visual, auditory, or combined.

Keywords: reaction time,movement time,men,women,swimming

COACHES' PERSPECTIVES ON THE DESIGN AND IMPLEMENTATION OF SWIMMING TRAINING CAMPS: AN INTERNATIONAL SURVEY

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The coaches have a vital role in designing the training experiences and meeting the demands of the athletes in the training camps. The present study aimed to investigate the aspects of the coaches in the context of the swimming training camps for the competitive swimmers. One-hundred nineteen swim coaches (99 males/10 females) voluntarily completed an online survey (Lime Survey). The coaches involved in the present study showed diverse geographical locations (43 countries worldwide), more than 11 years of experience in coaching, and education in sports science or coaching (51%). According to the results, training camps are marked by an increase in training volume and frequency. The pool-based training sessions last approximately 120 minutes, and most coaches use double daily sessions most days of the training camp (69%). The training load increases by 20-40% in the water, but dryland training varies, often remaining constant or varying relative to in-water training. The coaches reported that they focus on technical development (51%), aerobic work (35%), speed (31%), and dry-land conditioning (25%), while the training priorities often vary depending on the phase of the season (55%). The majority of coaches modify the training content relative to the athletes' event specialization (65%), indicating the individualized nature of training camp design. The fatigue management strategies include objective and subjective measures (e.g., sleep quality – 46%), resting heart rate (49%), perceived fatigue (44%), and biochemical markers (34%). When returning to regular training, most coaches modify the training to decrease the volume to allow recovery by approximately 10 to 20% (40%). The periodization strategies during training camps vary, and some coaches incorporate training camps into long-term plans, while others view them as short-term, intense training blocks. The results offer new insights into the strategies used during training camps in swimming and have implications for optimizing training design and athlete management in competitive swimming.

Keywords: Coaches' Perceptions, Training Camps, Training Process, World-Wide Survey, Swim Coaches

COMPARATIVE STUDY OF SPORTS PERFORMANCE IN FEMALE WINDSURFING ATHLETES IN IQFOIL AND TECHNO 293 CLASSES (AGES 15 AND 17)

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The decision by the World Sailing Federation in November 2019 to replace the Olympic RS:X class with the iQFOiL class, starting with the Paris 2024 Olympic Games, presented a significant challenge for athletes and coaches transitioning between classes. The purpose of this study was to compare the competitive performance of female windsurfing athletes in the Techno 293 and iQFOiL classes. The parameters evaluated were: a) total race time, b) maximum speed, and c) average speed. The research sample consisted of 933 races for female athletes aged 15 and 17, held at European and World Championships from 2021 to 2024. Of these, 480 races were in the Techno 293 class and 453 were in the iQFOiL class. Differences between the two classes were analyzed using the Mann-Whitney U test (for non-normally distributed data) and the Independent Samples t-test (for normally distributed data). For the 15-year-old athletes, the iQFOiL class showed significantly better performance than Techno 293 in Total Race Time ($U=877.00$, $Z=-14.55$, $p<.001$), Maximum Speed ($U=.000$, $Z=-15.43$, $p<.001$), and Average Speed ($U=1.000$, $Z=-15.43$, $p<.001$). Similar results were observed for the 17-year-olds, where a significant class effect was found for Total Race Time ($U=3380.50$, $Z=-16.99$, $p<.001$), Average Speed ($U=19.000$, $Z=-18.94$, $p<.001$), and Maximum Speed ($t(544) =138.54$, $p<.001$). In conclusion, the iQFOiL class has fundamentally changed windsurfing dynamics, requiring athletes to manage equipment differently. Training programs should prioritize safety and rapid decision-making due to significantly increased speeds. Furthermore, developing familiarity with high speeds is essential to ensure that the fear of error does not become an inhibiting factor in performance.

Keywords: Hydro foiling, Windsurfing Performance, Equipment Transition, Youth Female Athletes

COMPARISON BETWEEN TRADITIONAL AND CLUSTER SETS ON KINEMATICAL CHARACTERISTICS DURING SHOULDER PRESS ON A SMITH MACHINE

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Cluster sets are a resistance training method that involves breaking a traditional set into smaller "cluster" of repetitions with short rest intervals in between. This approach allows for greater maintenance of force, power, and technique compared to continuous repetitions performed to fatigue. In upper body exercises, such as pressing and pulling movements, cluster sets may enhance performance, improve training volume, and reduce fatigue-related declines. The present study examined the effect of four different resistance training protocols on performance during the shoulder front press exercise performed on a Smith machine. Methods Thirteen resistance trained males (age: 27.1±7.1 years; mass: 80.6±4.8 kg; height: 180.53.7cm) participated in the study. All participants gave their written consent to participate in the study, while they were all healthy and had approximately 8.1±2.3 years of training experience. Participants visited the gym on four non-consecutive days. During the first day, the anthropometric characteristics and the one repetition maximum (1RM) in shoulder press were measured. During the next 3 days, participants performed 3 sets of 6 repetitions at 85% of 1RM following traditional (TRD), inter repetition rest (IRR) where a 20sec interval was placed between repetitions and a cluster of 2 repetitions (CL2) where a 40sec of rest was placed between doubles. The rest intervals between sets were equalized while all protocols performed randomly by participants. Changes in MV and the VL% were measured via a linear transducer (Chrono jump, Bosco System). Statistical analysis included the Anova for repeated measures and the level of significance was set at $p \leq 0.05$. Results For all three sets the VL% was significantly different between TRD and IRR ($P<0.001$) as well as between TRD and CL2 ($P<0.001$). However, no significant differences were found between IRR and CL2 ($P >0.05$). In addition, no significant difference was found between protocols for MV during sets 1 and 2, although a significant effect was found for set 3, between TRD and IRR and between TRD and CL2 with TRD demonstrating lower MVs compared to IRR and CL2 especially during the fifth and sixth repetitions.

Keywords: cluster set, smith machine, power

COMPARISON BETWEEN TRADITIONAL AND CLUSTER SETS ON KINEMATICAL CHARACTERISTICS DURING SHOULDER PRESS ON A SMITH MACHINE

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During resistance training, gradual fatigue is observed as repetitions are completed. This fatigue is mainly accompanied by a decrease in repetitions velocity. In an attempt to reduce the repetitions velocity loss, the cluster sets training method is used. The present study aimed to examine the effect of cluster sets training of two repetitions on the mean velocity (MV) and percentage velocity loss (%VL) in shoulder presses exercise. Twelve trainees (age: 27.1±7.1 years; mass: 80.6±4.8kg; height: 180.53±7cm) participated in the study. The participants visited the laboratory on three nonconsecutive days. The first measurement included an assessment of maximum strength (1RM). The second and third measurements included, in random order, either 6 consecutive repetitions of 3 sets at 85% of 1RM, with a 180-second rest between sets, or in clusters of 2 repetitions with a 40-second rest between repetitions and a 100-second rest between sets. Changes in MV and %VL were measured via a linear transducer (Chrono jump, Bosco System). Statistical analysis was performed using a paired samples T-Test, with the level of statistical significance at $p \leq 0.05$. Performing the first set in clusters resulted in a higher MV in the 5th (MV= 40.1%, p=0.000) and 6th (MV=34%, p=0.001) repetition compared to continuous repetitions. The second set, led again to higher MV in the 3rd (MV= 40.6%, p=0.001), 5th (MV=38.6%, p=0.000), and 6th (MV= 32.3%, p=0.000) repetition, respectively. In the third and final set, higher MV was observed compared to continuous repetitions in the 3rd, 5th and 6th repetition (MV= 39%, p=0.005, MV= 37.4%, p=0.000, MV= 31.4%, p=0.000). Similarly, the %VL was significantly greater for continuous repetitions following all sets compared to clusters (set 1: -43.4±12.4% vs. -23.8±10.6%, p = 0.001; set 2: -47.2±9.2% vs. -28.7±12.1%, p=0.001; set 3: -50.8±13.9% vs. -27.2±9.9%, p=0.001). Cluster training clearly maintains repetitions velocity at higher levels than traditional repetitions, especially at the end of training sets with equal rest times. Therefore, applying double repetitions in shoulder press exercise may enhance barbell MV and maintain velocity loss.

Keywords: Resistance training,shoulders press,cluster sets,smith machine,mean velocity

COMPARISON BETWEEN TRADITIONAL, INTRA-REPETITION-REST AND CLUSTER IN THE REPETITION VELOCITY LOSS DURING THE SHOULDER PRESS EXERCISE

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The traditional method (TR) refers to a method in which athletes perform a set of continuous repetition until the set is completed. This training method results in the accumulation of high levels of fatigue, depleting phosphagen energy stores, negatively affecting neuromuscular functions, and subsequently leading to an overall reduction in mean velocity of load movement. A different approach to optimizing performance is intra-repetition-rest (IRR) configuration which includes single repetitions and the cluster training (CT) where the athlete perform group of repetitions with rest periods in between, aiming to maintain velocity at high levels. The purpose of this study was to compare the TR method the IRR and the CT of three repetitions in order to identify which method will lead in the lowest decrease in the velocity loss during the shoulder press exercise. The study included 12 healthy male participants (n=12; age: 26.5±6.3 years; mass: 79.8±3.7kg; height: 179.5±3.5cm). Participants visited the gym in four nonconsecutive days. On the first visit, the assessment of the 1 repetition max (1RM) was performed and on the following days, in random order, participants performed 3 sets of 6 repetitions at 85% of the RM, either continuously or IRR (with 20" rest in between each repetition and 80" between sets) or in CT of three repetitions (with 60" between repetition and 120" between sets). A linear position encoder (Chronojump) was used to track velocity loss. One way ANOVA was used, and the level of significance was set at p≤0,05. During the first set a significant difference was found (p=0,030; η2=0,504), between TR and IRR (p=0.007) and almost with CL3 (p=0.088). During the second set a significant difference was found (p=0,001; η2=0,781), between TR and IRR (p=0.001) and almost with CL (p=0.084). During the third set a significant difference was found (p=0,001; η2=0,800) between TR and IRR (p=0.001) and CT (p=0.030), while a significant difference was also found between IRR and CL3 (p=0.015). The results of the study suggest that when performed the shoulder press exercise with equalized rest periods the IRR seems to induce the lowest velocity loss compared to TR and CL3 training methods.

Keywords: intra-repetition-rest, shoulder press, resistance training, cluster

COMPARISON OF DYNAMIC APNEA IN UNDERWATER AND SURFACE 50 M MONOFIN SWIMMING: EFFECTS ON PERFORMANCE, KINEMATICS, AND HEART RATE KINETICS

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The present study compared kinematic and heart rate (HR) responses during a maximal 50 m monofin finswimming effort under three apnea conditions: underwater (UW), surface swimming without a snorkel (SW), and surface swimming with a sealed snorkel (SN). Ten elite finswimmers (age: 16.3±0.8 years), all members of the national team, performed three maximal trials on consecutive days in a randomized order. Performance time (PT), number of dolphin kicks (ND), kick frequency (FD), rating of perceived exertion (RPE), and HR were assessed. PT, ND, FD, and RPE were analyzed using one-way repeated-measures ANOVA. HR responses at three time points [peak during exercise (HRpeak), early recovery decline (HRlow), and subsequent recovery increase (HRhigh)] were analyzed using two-way repeated-measures ANOVA (condition × time). PT differed significantly between conditions ($p<0.001$), with UW being faster (17.38±1.32 s) compared to SW (19.20±1.63 s) and SN (19.38±1.52 s). ND was significantly lower in UW (40±5) compared to SW (44±6) and SN (44±5) ($p<0.001$), whereas no significant differences were observed in FD (UW: 139±22, SW: 140±22, SN: 137±19 ND·min^{-1}; $p=0.677$). RPE did not differ significantly between conditions (UW: 7±1, SW: 8±1, SN: 8±1; $p=0.062$). No significant condition × time interaction ($p=0.465$) or main effect of condition ($p=0.972$) was observed for HR. However, a significant main effect of time was found ($p<0.001$, $\eta^2=0.823$), indicating marked changes across measurement points during exercise and recovery (HRpeak: 168.5±13.8, HRlow: 146.9±9.6, HRhigh: 160.1±7.3 bpm for UW; HRpeak: 170.5±6.9, HRlow: 140.8±17.7, HRhigh: 162.2±10.8 bpm for SW; and HRpeak: 171.1±9.6, HRlow: 143.1±19.8, HRhigh: 159.5±10.4 bpm for SN). In conclusion, underwater apnea monofin finswimming demonstrates hydrodynamic superiority, enabling higher speeds. Notably, the heart rate fluctuations observed during the post-exercise phase following short-duration, high-intensity exercise indicate a physiological rebound effect, suggesting that autonomic responses associated with the diving reflex may become more pronounced during recovery from maximal apnea-based exertion.

Keywords: Finswimming, Diving reflex, Dolphin kicks, Frequency, RPE

COMPARISON OF UNDERWATER AND SURFACE DYNAMIC ARNEA IN 50 M MONOFIN SWIMMING: EFFECTS ON PERFORMANCE AND BIOCHEMICAL RESPONSES

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The present study investigated and compared lactate (LA) and glucose (GLU) responses to a maximal 50 m finswimming effort using a monofin under three apnea conditions: a) full underwater (UW), b) surface swimming without a snorkel (NS), and c) surface swimming with a sealed snorkel (SS). Ten male finswimmers (age: 16.3±0.8 years), all members of the national team, performed three maximal trials on consecutive days in a randomized order. Performance time (PT), blood LA and GLU concentrations, and rating of perceived exertion (RPE) were assessed. Capillary blood samples were collected at the rest and during recovery, with LA measured at baseline and at the 1st, 3rd and 5th minutes of recovery to determine peak concentrations and GLU assessed at baseline and at the 1st minute of recovery. PT and RPE were analyzed using a one-way repeated-measures ANOVA (condition), while LA and GLU were analyzed using a two-way repeated-measures ANOVA (condition × time). PT differed significantly between conditions ($p<0.001$), with UW being faster compared to NS and SS (17.38±1.32 vs 19.20±1.63 and 19.38±1.52 s, respectively). No significant differences were observed in RPE (7.4±0.8, 8.3±0.9 and 7.9±0.6, respectively, $p=0.062$). LA concentrations increased significantly over time ($p<0.001$), with no interaction effect, indicating similar responses across conditions UW, NS and SS (from 1.52±0.64 to 10.68±2.34, 1.29±0.47 to 11.93±2.77 and 1.44±0.41 to 11.76±2.28 mmol/L, respectively, $p<0.001$). In contrast, GLU concentrations did not change significantly over time ($p=0.076$) and did not differ between conditions (from 5.81±0.52 to 5.57±0.60, 5.46±0.65 to 5.35±0.55 and 5.85±0.84 to 5.45±0.53 mmol/L, respectively, $p=0.292$). These findings suggest that UW is the fastest condition, likely due to reduced hydrodynamic resistance, despite similar RPE. The marked increase in LA across all trials reflects a strong contribution of anaerobic glycolysis during maximal effort. In contrast, GLU remained stable, likely due to the short duration of the effort (~19 s), which may be insufficient to induce significant changes in blood glucose levels. In conclusion, apnea condition affects performance but not perceptual or glycaemic responses, while metabolic stress, as reflected by LA, is similarly elevated across apnoic conditions.

Keywords: Finswimming,Apnea,Lactate,Glucose,Performance

CORRELATION BETWEEN DOUBLE-LEG FREQUENCY OF SPEED KICK TEST WITH SINGLE-LEG PREFERRED AND NONPREFERRED LEG IN FEMALE TAEKWONDO ATHLETES

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In taekwondo, combat ability is mainly based on distance control, speed, and accuracy of kicks, elements that allow the athlete to dominate the competition area and perform effective offensive actions. The Frequency Speed Kick Test (FSKT), which is considered a reliable tool for evaluating the sport-specific anaerobic capacity of taekwondo, as it simulates competitive demands and allows the recording of the speed and frequency of kicks. The purpose of the study was to investigate the correlation between the bilateral FSKT with the preferred and non-preferred single-leg FSKT. Nine female taekwondo athletes (age: 20.5±0.9 years, height: 1.67±0.05m, mass 67.3±19.3kg) participated in the study. The experimental procedure included two nonconsecutive days. During the first day athletes' anthropometric characteristics were evaluated and following a warm-up condition the double leg FSKT was measured. The second day athletes followed the same warm-up condition and then the single leg FKST was performed with preferred and non-preferred leg with a randomized order. From the FSKT variables such as the total number of kicks (SUM), maximum performance (MAX), and the performance decrement index (%LOSS) were recorded. The analysis was performed with Pearson r correlation coefficient, and the level of significance was set at $p \leq 0.05$. Statistical analysis showed a strong correlation between FSKTMAX with preferred leg FSKTMAX ($r=0.732$, $p = 0.032$) but with nonpreferred leg FSKTMAX ($r=0.520$, $p=0.151$). Similarly, significant correlation was found between FSKTSUM with preferred leg FSKTSUM ($r=0.843$, $p=0.004$) but not with nonpreferred leg ($r=0.611$, $p=0.081$). No significant correlations were found between FSKT%LOSS with preferred and nonpreferred FSKT%LOSS ($p>0.05$). In conclusion, the findings of the study that the preferred leg is mainly affect the bilateral FSKT performance. The results can be utilized by coaches to identify the preferred leg, evaluate anaerobic capacity, and design individualized training programs that particularly target the improvement of the nonpreferred leg performance.

Keywords: Frequency of kicks, speed, performance, single leg test

CORRELATION BETWEEN LEAN MASS AND MULTIPLE FREQUENCY SPEED OF KICK TEST IN FEMALE TAEKWONDO ATHLETES

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Lean mass is a key factor for power performance. In Taekwondo, a combat sport with body categories, changes in lean mass may affect combat ability and endurance during a competition. However, the data are scarce regarding the correlation between lean mass and combat performance in Taekwondo. The purpose of the study was to investigate the correlation between lean mass and multiple frequency speed of kick test (MFSK) in female Taekwondo athletes. A total of seventeen (N = 17) competitive female Taekwondo athletes (age: 18.5±2.9 years; mass: 59.5±10.1kg, height: 1.68±0.04m) participated in the study. The athletes visited the laboratory on two separate occasions. During the first visit, body composition was assessed using dual-energy X-ray absorptiometry (DEXA). During the second visit, lower-body muscular power was evaluated using the countermovement jump (CMJ) and standing long jump tests (LJ), followed by assessment of the MFSK over a predetermined time period. The MFSK protocol consisted of five sets, during which the athletes performed as many kicks as possible for 10 seconds, followed by 10 seconds of passive recovery. Kicks were executed alternately with both legs and above a predefined height, which was determined based on trunk level. The Pearson's r correlation coefficient was used for the statistics. Moderate to large correlations were found between the MFSK with legs lean mass (r ranged from 0.204 to 0.565) and with total lean mass (r ranged from 0.351 to 0.542). In addition, total kicks were significantly correlated with leg lean mass ($r = 0.553$, $p = 0.027$) and almost with total lean mass ($r = 0.440$, $p = 0.077$). Total, legs, and trunk lean mass were significantly correlated with CMJ power (r ranged from 0.870 to 0.916), whilst total lean mass almost correlated with LJ ($r = 0.452$, $p = 0.068$). The results of the study suggest that lean mass has a moderate impact on the combat ability of female athletes. These findings may be affected by neural activation during MFSK.

Keywords: kick, power, lean mass, lower body.

CORRELATION BETWEEN MULTIPLE FREQUENCY OF SPEED KICK TEST WITH ISOKINETIC LEG EXTENSION AND FLEXION IN FEMALE TAEKWONDO ATHLETES

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The ability to maintain a high kicking frequency stands out as a key determinant of competitive performance and a significant influence on match outcomes in Taekwondo. Athletes primarily use their lower limbs to perform repeated kicking techniques which are often evaluated through electronic scoring systems that record the effectiveness of each strike. Thus, together with high kicking frequency athletes must apply a high force in order to achieve a point. However, the connection between lower body force and kicking frequency has not been investigated. This study aimed to examine the relationship between isokinetic knee extension and flexion with multiple frequency of speed kick (MFSK) in female Taekwondo athletes. Seventeen competitive-level female athletes (age: 18.5±2.9 years; mass: 59.5±10.1kg, height: 1.68±0.04m) participated in the study. On the first day, anthropometric characteristics were measured and the isokinetic knee extension and flexion assessment was performed at 60°/s, measuring peak and mean torque of the lower limb muscles. On the second day, the MFSK test was performed by counting the frequency of palteum chagi kicks toward a chest-level target. The protocol consisted of five sets of 10 seconds of continuous kicking performed with alternating legs, with 10 seconds of passive recovery between efforts. The Pearson r correlation coefficient was used to examine the relationship between peak isokinetic torque and MFSK. The results showed significant correlations between the sum of kicks during the MFSK test with extension peak torque (right: r=0.583, p=0.014; left: r=0.511, p=0.036) with flexion peak torque (right: r=0.630, p=0.0070; left: r=0.552, p=0.032), with extension mean torque (right: r=0.522, p=0.032; left: r=0.387, p=NS) and with mean flexion torque (right: r=0.551, p=0.022; left: r=0.556, p=0.021). No significant correlations were found between isokinetic measurement variables and best set during MFSK). The findings of the present study suggest that the produced isokinetic torque generated at an angular velocity of 60°/s is an important factor influencing competitive performance in female Taekwondo athletes, as higher torque is associated with the ability to perform a higher number of kicks. This demonstrates a direct relationship between isokinetic muscle strength and the MFSK.

Keywords: Taekwondo, isokinetic torque, combat performance, female athletes

CORRELATION BETWEEN PHASE ANGLE WITH UPPER AND LOWER BODY MUSCLE POWER

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Phase angle is an index that reflects cellular health, the condition of cell membranes, and fluid distribution factors that are directly related to athletic performance. However, whether the phase angle correlates with muscle power remains largely unclear. The aim of the study was to investigate the correlation between phase angle and upper- and lower-body muscle power in male swimmers. Thirteen male swimmers (age: 20.31 ± 1.49 years; body mass: 84.12 ± 10.08 kg; height: 181.08 ± 5.71 cm) from the University of Physical Education and Sport Science participated in the study. The participants attended the laboratory on two consecutive days. Measurements included: body composition via bioelectrical impedance analysis (BIA), handgrip strength, upper body muscle power through seated medicine ball throws, and lower body muscle power via countermovement (CMJ) vertical jump. For the statistical analysis, Pearson's correlation coefficient (r) was used, and statistical significance was set at $p \leq 0.05$. The results showed significant correlations between phase angle and upper-body muscle power ($r = 0.618$-0.688, $p < 0.05$), handgrip strength ($r = 0.650$, $p = 0.016$), and lower-body power ($r = 0.665$, $p = 0.013$). Additionally, significant correlations were observed between fat-free mass and both upper- and lower-body muscle power (r ranged from 0.606 to 0.902, $p < 0.05$). In conclusion, the findings of the study suggest that phase angle may serve as a moderate indicator of muscle power in both upper- and lower-body power production in swimmers. However, fat-free mass appears to be a stronger predictor of muscle power in male swimmers.

Keywords: phase angle, upper limb, lower limb, muscle power, swimming athletes, bioelectrical impedance analysis, fat- free mass

CORRELATION BETWEEN SWIMMING PERFORMANCE AND BODY COMPOSITION IN FEMALE SWIMMERS

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The aim of the present study was to investigate the relationship between body composition and muscle power with swimming performance in young female swimmers. Seven female swimmers participated in the study (age: 20.86 ± 0.38 years, body mass: 58.9 ± 6.31 kg, height: 163.28 ± 4.35 cm). The experimental procedure included three days of measurements. On the first day, the athletes attended the laboratory, where they were informed about the study and signed an informed consent form. Subsequently, body composition was assessed using Dual-Energy X-ray Absorptiometry (DEXA), evaluating lean body mass, percentage total body fat, and total bone mineral density. On the following day, individual time trials were conducted in the swimming pool in order to evaluate the ability to perform six repeated 25 m sprints with a 30-second rest interval. The best time and the total time were recorded. Finally, on the third day, muscle power was assessed through repeated vertical jumps for 15 seconds, during which the percentage decline in vertical jump performance was evaluated. Statistical analysis was performed using Pearson's r correlation coefficient. Correlation analysis revealed strong negative correlations between lean body mass and time in the repeated sprint test (r ranging from −0.741 to −0.8604, $p < 0.05$). Similarly, significant correlations were found between the repeated vertical jump test and the best swimming performance time ($r = −0.793$, $p = 0.034$), and a nearly significant correlation with total time ($r = −0.762$, $p = 0.062$). The results indicate that lean body mass is an important biological indicator of swimming performance in female swimmers. In addition, the relationship between the percentage decline in vertical jump performance and the best swimming time suggests that in a sport such as swimming, sprint ability may be estimated using the repeated vertical jump test. Practically, coaches should regularly monitor the body composition of their athletes, while the 15-second repeated vertical jump test may serve as a useful indicator for predicting maximal swimming speed.

Keywords: Freestyle swimming, muscle mass, anaerobic capacity, vertical jump.

CORRELATION OF SWIMMING COMPETITIVE LEVEL WITH PARAMETERS OF HORIZONTAL AND VERTICAL DISPLACEMENT IN THE AERIAL AND WATER ENTRY PHASE DURING FRONT-CRAWL AND BUTTERFLY START

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The purpose of the study was to examine the effect of swimming performance level on horizontal and vertical displacement parameters during the flight and water entry phases of a start from a standing position. The sample consisted of 5 high-level swimmers (>780 aquatic points: 978 – 781) and 5 lower-level swimmers (<780 aquatic points: 671 – 777). The flight phase was recorded using a digital camera (100 Hz) from the TEMPLO CONTEMPLAS system. Starts were performed from a starting block with a footrest, and the camera was mounted on a stable tripod at 6.50 m perpendicular to the direction of motion and 2 m from the starting wall. A two-dimensional kinematic analysis followed, using the KINOVEA (0.9.5) open-source software. The independent samples t-tests revealed that high-level and lower-level swimmers showed no statistically significant differences in water entry distances for the hands (3.10 ± 0.30 m vs. 3.20 ± 0.40 m; p= 0.686), hips (2.82 ± 0.34 m vs. 2.80 ± 0.43 m; p= 0.923), and feet (2.54 ± 0.47 m vs. 2.53 ± 0.27 m; p= 0.967). However, high-level swimmers positioned their hips at a higher vertical position during the initial phase on the block (1.42 ± 0.06 m vs. 1.39 ± 0.05 m; p= 0.391), with a slightly smaller decrease in vertical position until hand take-off (0.09 ± 0.04 m vs. 0.10 ± 0.04 m; p= 0.563). Additionally, high-level swimmers showed a smaller, though not statistically significant, deference between hand and foot entry distances (0.56 ± 0.24 m vs. 0.67 ± 0.15 m; p= 0.444), suggesting a smaller hip entry angle (38.15 ± 11.10 deg vs. 42.21 ± 3.02 deg; p= 0.454), and consequently, the maintenance of higher horizontal entry velocity (3.96 ± 0.38 m/s vs. 3.76 ± 0.77 m/s; p= 0.621), which are associated with a more effective start.

Keywords: competitive level,freestyle,butterfly,horizontal displacement,vertical displacement,entry distance.

CORRELATIONS BETWEEN SERVE SPEED WITH BODY COMPOSITION, LINEAR SPRINT AND MUSCLE POWER IN TENNIS PLAYERS

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In tennis, serving speed is considered to be one of the major contributors of success. Thus, enhancing the serve speed may lead to a significant advantage during a tennis match. However, whether serve speed is affected by body composition, power and sprint ability remains largely unclear. The purpose of the present study was to investigate the correlations between serving speed in tennis with muscular power, sprint performance, and body composition. The study sample consisted of fourteen tennis athletes (N = 8 males and N = 6 females; age: 21.3±0.6 years; mass: 69.6±11.5kg; height: 1.74±0.09m), all undergraduate students at the School of Physical Education and Sport Science of Democritus University of Thrace. Participants visited the laboratory for body composition analysis via dual-energy X-ray absorptiometry (DEXA), and then muscular power was evaluated with counter movement jump (CMJ) using the Optojump device. The next day, serve speed was measured with a radar gun at the tennis courts and then sprint performance tests were performed including the 20m linear sprint and T-test agility. The Pearson r correlation coefficient was used to investigate the correlations between variables, and the level of significance was set at $p \leq 0.05$. Significant correlation was found between serve speed and arms lean mass ($r = 0.735$, $p < 0.05$), CMJ power (0.749, $p < 0.05$) and joule during long-jump ($r = 0.756$, p 0.05) and T-Test ($r = 0.535$, $p > 0.05$) were non-significant. These results suggest that lean mass and lower body power production measured with vertical and horizontal jumps may determine serve speed in tennis. From a practical point of view it is recommended to focus on increasing upper body lean mass and lower body muscle power in both male and female athletes in order to enhance serve speed.

Keywords: service, speed, tennis, muscular power, body composition

CORRELATIONS BETWEEN SERVE SPEED WITH BODY COMPOSITION, MUSCLE STRENGTH AND THROWING PERFORMANCE

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Serve speed is a key determinant factor of success in tennis. Although serve speed is an important performance indicator, other factors such as lean mass, muscle strength and throwing ability may be related to physical fitness and probably influence movement execution and overall performance. Therefore, the purpose of the present study was to investigate the relationship between body composition, muscular strength and throwing ability with serve speed in tennis athletes. Fourteen (n = 14) tennis players (N = 8 males and N = 6 females; age: 21.3 ± 0.6 years; mass: 69.6 ± 11.5 kg; height: 1.74 ± 0.09 m), participated in the study. Athletes visited the laboratory for body composition analysis via dual-energy X-ray absorptiometry (DXA) and then muscular strength was evaluated using a handgrip dynamometer. The next day, athletes visited the tennis facilities where serve speed was recorded using a radar gun. Thereafter, throwing ability was assessed with medicine ball throws overhead, while speed and agility were measured using a 20-meter sprint and the T-test, respectively. Pearson correlation analysis was used for the statistical analysis, and the level of significance was set at $p \leq 0.05$. Significant correlation was found between serve speed and arms lean mass ($r = 0.735$, $p < 0.05$). Serve speed also showed statistically significant positive correlations with throwing ability, as measured by the medicine ball throws (r ranged from 0.733 to 0.765, p 0.05). In conclusion, the findings of the present study indicate that muscular strength, throwing ability, and lean mass are key factors associated with serve speed in tennis players and should be taken into consideration in the design of training interventions.

Keywords: tennis, serve speed, body composition, physical fitness, handgrip strength.

EFFECT OF COMPETITIVE LEVEL ON HIP VELOCITY VARIATION IN BUTTERFLY SWIMMING

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Aim of the study was to investigate the effect of competitive level on hip velocity fluctuation in young swimmers during the butterfly stroke. The sample consisted of 7 high-level swimmers (>700 aquatic points: 706 – 798) and 8 lower-level swimmers (<700 aquatic points: 418 – 683), all specializing in the butterfly stroke. Measurements were conducted in a 25 m pool, where each swimmer performed a 50 m butterfly sprint at maximum intensity, including a competitive turn after the first 25 m. Underwater movement was recorded between the 35–45 m mark before the finish using a GoPro 10 action camera at a sampling frequency of 60 Hz. The camera was positioned at a depth of 0.8 m and at 6 m perpendicular to the swimmer's direction of motion. Anatomical landmarks were marked on the right side of each swimmer's body using a waterproof permanent black pen: the lateral malleolus of the ankle, the knee, and the greater trochanter of the femur, which was used to determine the position of the hip. Hand entry into the water was used to define the start and end of a stroke cycle, and the digitization of the specific anatomical points was performed using the open access software KINOVEA 0.9.5. To evaluate horizontal hip velocity fluctuation within a stroke cycle, maximum and minimum velocities were calculated, as well as the coefficient of variation (CV). Independent samples t-tests revealed that higher-level swimmers, compared to lower-level swimmers, exhibited a statistically significant ($p < 0.05$) higher maximum horizontal hip velocity (2.32 ± 0.23 m/s vs. 2.03 ± 0.13 m/s), as well as a higher minimum velocity (1.10 ± 0.20 m/s vs. 0.90 ± 0.14 m/s). Furthermore, they showed statistically significant ($p < 0.05$) higher mean velocity values within a stroke cycle (1.73 ± 0.22 m/s vs. 1.41 ± 0.11 m/s) and lower intra-cyclic velocity variation (CV: 17.44 ± 1.96 vs. 20.81 ± 2.65). These findings suggest that, in addition to generating higher propulsive forces, higher-level swimmers were able to significantly reduce drag forces, thereby avoiding major decelerations and adopting a more economical swimming style.

Keywords: Butterfly, Intra-cyclic velocity variation, Hip velocity, kinematic analysis

EFFECT OF COMPETITIVE SWIMMING LEVEL ON MEAN HORIZONTAL VELOCITY DURING THE GLIDING PHASES OF THE BREASTSTROKE TURN

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The purpose of the study was to examine the mean horizontal velocity during the individual gliding phases of the breaststroke turn in relation to competitive level. The sample consisted of 12 specialized breaststroke swimmers, categorized into a high-level group (6 swimmers, WORLD AQUATICS: >750 points) and a moderate-level group (6 swimmers, WORLD AQUATICS: 500–750 points). Each participant swam 50 m breaststroke at maximum intensity in a 25 m pool, performing a full competitive breaststroke turn. The underwater phases were recorded using 4 high-frequency (100 Hz) underwater cameras (TEMPLO CONTEMPLAS system), positioned on the side wall of the pool at 1.5 m, 5 m, 10 m, and 15 m from the turn wall, and at a perpendicular distance of 6 m from the swimmers' axis of motion. A two-dimensional kinematic analysis was conducted using the open-source software KINOVEA (0.9.5), and the mean horizontal velocity was calculated for each gliding phase, as well as the overall mean velocity across all glides. The 1st glide was defined from the final foot contact with the wall until the onset of knee flexion for the dolphin kick. The 2nd glide was determined from the lowest foot position and completion of the downward phase of the dolphin kick until the initiation of the pull-out. The 3rd glide lasted from the end of the pull-out until the beginning of the arm recovery, while the 4th glide was defined from the completion of the leg recovery until the start of the first breaststroke arm pull. Independent samples t-tests were used for statistical analysis, revealing that high-level swimmers exhibited significantly higher mean horizontal velocity both in individual gliding phases and in the total duration of the gliding phases compared to moderate-level swimmers. Consequently, the ability to maintain high levels of horizontal velocity during glides appears to be a decisive factor for turn effectiveness in breaststroke, as no propulsive forces are applied during these phases; instead, only drag forces act upon the swimmer, leading to a progressive reduction in velocity.

Keywords: breaststroke turn, average horizontal gliding velocity, competitive level, underwater phase, kinematic analysis

EFFECT OF DRY-LAND HIGH-FREQUENCY UPPER LIMB MOVEMENT TRAINING ON PERFORMANCE AND KINEMATIC PARAMETERS IN SPRINT SWIMMING

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The aim of the study was to examine the effects of fast upper-limb swings during dry-land training on arm movement frequency, as well as on swimming kinematics and performance. Twenty-nine competitive swimmers (16.2 ± 3.3 years) were randomly assigned to the experimental (EXP, n=13) and the control (CON, n=16) groups and participated in the same swimming training for a six-week period. Before and after the training period the swimmers were tested in: i) dry-land upper-limb movement frequency (SRdry) during 10 s maximal effort trial, ii) a single 50 m sprint to record performance time (S50) and stroke rate (SR), iii) a series of 8–12 × 25 m front crawl repetitions with increasing intensity to calculate the maximum speed (maxS) and maximum SR (maxSR). The SR reserve (SRres) was calculated as a percentage from the SRdry difference and maxSR. The EXP group completed, 2-3 sessions per week, dryland training protocol consisted of two sets of upper-limb swings of 10-20 s duration performed at 70%, 80%, 90%, and 100% of each swimmer's SRdry. The CON participated in the swimming sessions only. SRdry was improved after the training period in both groups (EXP: 118 ± 5 vs. 127 ± 11, CON: 122 ± 7 vs. 127 ± 10 cycles·min-1, p 0.05). Before the training period, SRres was related to S50 and maxS in the whole sample ($r = 0.57$, $r = 0.59$, $p < 0.01$) and to maxS within each group (EXP: $r = 0.62$, $p < 0.05$, CON: $r = 0.57$, $p < 0.05$). Before to after training difference in maxS and SRres in the EXP group tended to a significant correlation ($r = 0.53$, $p = 0.06$). Despite improvements in SRdry in both groups, no changes were observed in S50 or SR and maxSR. However, the SRres indicating the difference between SRdry and swimming SR in 50 and 25 sprints requires further attention to verify connections to maximum swimming speed.

Keywords: speed of movement, dryland training, competitive swimming, stroke rate, performance

EFFECT OF GENDER, AGE, AND COMPETITIVE LEVEL ON ROTATION DURATION AND WALL CONTACT TIME DURING THE FRONT-CRAWL SWIMMING TUMBLE TURN

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Effect of Gender, Age, and Competitive Level on Rotation Duration and Wall Contact Time during the FRONT-CRAWL SWIMMING tumble turn Aim of the study was to investigate the effect of “age”, “gender”, and “competitive level” on foot-to-wall contact time, rotation duration during the front-crawl tumble turn, and overall turn performance. The sample consisted of 85 male and 66 female swimmers, aged 11-13 (N=40), 14-15 (N=61), and 16-32 (N=50) years. Participants were categorized into “low” (0-33.3%), “moderate” (33.4-66.6%), and “high” (66.7-100%) competitive levels based on their percentage performance in the 100 m freestyle for each gender and age group. The subjects performed a competitive front-crawl tumble turn while swimming 50 m front-crawl at maximum intensity in a 25 m pool. Each effort was recorded using 4 synchronized waterproof cameras (100 Hz) of the TEMPLO CONTEMPLAS system. The cameras were fixed on the side wall of the pool at a depth of 0.80 m and at distances of 1.5, 5, 10, and 15 m from the turn wall, with their optical axes perpendicular to the swimmers’ path of motion. The variables calculated were the foot contact time on the wall and the rotation duration (from full head submersion to initial foot contact with the wall). Turn performance was also measured as the time from 5 m before to 10 m after the turn, using the vertex of the head as the anatomical reference point. Three-way analysis of variance showed no statistically significant interactions for any dependent variable. However, a significant main effect of “gender” was found for rotation time, with males demonstrating significantly faster rotation than females across all age categories. Additionally, significant differences were identified between competitive levels regarding turn performance; “high-level” swimmers performed better than “moderate level” swimmers, who in turn outperformed those at a “low” competitive level. In contrast, no significant differences were found in foot contact time. These data support the view that even minor differences in individual parameters can lead to significant variations in final performance.

Keywords: Swimming, tumble turn, front-crawl, wall contact, rotation time

EFFECTS OF 4-WEEKS BATTLE-ROPE TRAINING ON BODY COMPOSITION AND WHOLE-BODY POWER PRODUCTION

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Battle ropes are considered to be a high metabolic exercise which may be used as main part of training or as supplementary component, including strengthening exercises for the upper body and lower limbs. However, the effect of short-term training on muscle power and body composition is not completely investigated. Purpose of the present study was to investigate the effect of 4-weeks exercise program with battle ropes on body composition and muscular power in students of the Department of Physical Education and Sport Science of the Democritus University of Thrace. Twelve male and female students (aged: 20.18±1.3 years; mass: 72.2±15.8kg; height: 1.72±11.4m), participated in the study and were randomly divided into two groups: the Battle ropes group (BR, n=8) and the control group (C, n=4). The Br followed a structured whole-body exercise program, while the C performed a simulation of the program using resistance bands. At baseline and immediately after the intervention weeks, measurements were conducted including BIA, anthropometric measurements, handgrip dynamometry, seated medicine ball throws (3kg and 2kg), countermovement jump (CMJ) and repeated CMJs using Optojump. Analysis included a two-way ANOVA for repeated measures, and the level of significance was set at $p \leq 0.05$. Anthropometric characteristics (mass, height, BMI) remained unchanged following the intervention training program ($p>0.05$). Body composition analysis showed a significant increase in trunk fat free mass for BR (2.45±2.3%, $p=0.05$) but no difference was observed with C. No other significant difference was found for total, arms and legs lean mass. Percent fat remained unchanged for both BR and C, whilst no difference was found for handgrip strength ($p>0.05$). Medicine ball slightly increased following BR (2kg: 5.0±3.9%, $p=0.05$; 3kg: 9.3±9.0%, $p=0.06$) but no difference was observed following C. CMJ height increased significantly following BR (5.8±2.5%, $p=0.001$) but no difference was found for C. Mean CMJ height during 15sec CMJs remained unchanged for both groups ($p>0.05$). The results of the study indicate that the BR training program led to significant increases in upper and lower body muscle power. Therefore, a short-term period of battle rope training may benefit overall power and trunk lean mass in physical education students.

Keywords: battle ropes, body composistion, repeated jumps, jump height, medicine ball throws, anaerobic capacity

EFFECTS OF 4-WEEKS BATTLE-ROPE TRAINING ON SWIMMING PERFORMANCE

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Swimming is a highly demanding sport in which the ability to develop and maintain high speed in the water is a decisive factor for competitive performance, especially in short-distance events. In the training process, repeated high-intensity sprints are commonly used to improve speed, speed endurance, and the neuromuscular performance of swimmers. Battle-ropes are a modern functional training tool that primarily activates the muscles of the upper limbs and the core, which play a crucial role in the production of propulsive force in the water. Given their biomechanical relevance, the use of battle ropes may serve as an effective means of improving swimming performance. The aim of this study was to examine the effect of a four-week battle ropes training program on repeated swimming sprint performance and explosive ability on land. The study involved 20 students (body mass: 75.68 ± 14.63 kg; body height: 174.8 ± 9.8 cm) from the Department of Physical Education and Sport Science, who were divided into an experimental group (n=13) and a control group (n=7). The experimental group followed a battle-rope training program consisting of two sessions per week, with a progressive increase in the work-to-rest ratio: 1:4 in the first week, 1:3 in the second and third weeks, and 1:2 in the fourth week. The control group performed a program using resistance bands. Before and after the intervention, anthropometric characteristics, body composition, six repeated 25-meter sprints, and repeated vertical jumps were assessed. Analysis of variance (ANOVA) showed a statistically significant improvement in repeated sprints (increases ranged from -1.7 to -4.1%, $p<0.05$) and in the total swimming time in the experimental group (-2.95%, p 0.05). In conclusion, training with battle-ropes appears to improve repeated swimming sprint performance, possibly due to the intense activation of the upper body muscles. The findings suggest that incorporating battle-ropes into swimmers' training programs may be an effective training method for improving swimming speed without significant effects on lower-body explosive power or body composition.

Keywords: swimming, battle-ropes, repeated sprints, upper limbs, explosive power

EFFECTS OF PARTIAL VERSUS FULL RANGE OF MOTION RESISTANCE TRAINING ON PEAK ISOMETRIC KNEE EXTENSION TORQUE IN TRAINED WRESTLERS

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Maximizing knee extensor strength is crucial for wrestling performance, yet the effects of partial range of motion with supramaximal loads on strength gains remain unclear. This study investigated the effects of partial range of motion (PART) versus full range of motion (FULL) resistance training on maximal isometric knee extension torque in wrestlers. Twelve trained wrestlers (n=12) with a mean age of 22.4 ±4.6 years and mean body mass of 81±21.08 kg participated in a within-subject design where each leg was randomly assigned to different training protocols. Baseline torque was assessed using an IsoForce isokinetic dynamometer (TUR GmbH, Germany) at six knee angles (15°, 30°, 45°, 60°, 75°, and 90°), with participants instructed to gradually increase force over 5 seconds to reach maximal voluntary torque, then maintain it for another 5 seconds. Following baseline assessment, a unilateral knee extension intervention was applied: one leg performed PART training (45–75°) for 8 weeks executing 5 sets of 5 repetitions at 5RM intensity within the PART, while the contralateral leg trained through FULL (0–100°) for 6 weeks executing 4 sets of 5 repetitions at 5RM intensity within FULL. In both protocols, the rest interval between sets was 60 s. Post intervention isometric torque was reassessed. For this analysis, maximum torque values across all angles were extracted for each condition. Two-way repeated measures ANOVA examined the effects of training method (partial vs. full ROM) and time (pre vs. post) on peak isometric torque. Results showed a significant main effect of time ($F(1,11)=38.14$, $p<.001$, partial $\eta^2=0.776$), with both training methods producing substantial increases in maximum torque (PART: 286.88±97.12 to 351.48±108.24 Nm; FULL: 275.05±100.24 to 350.51±113.15 Nm). Neither the main effect of method ($F(1,11)=0.392$, $p=.544$) nor the method×time interaction ($F(1,11)=1.329$, $p=.273$) reached significance, indicating similar strength gains regardless of training method. These findings suggest that both partial range training with supramaximal loads and full range training with maximal loads are equally effective for improving maximal isometric knee extension strength in wrestlers. Future analysis incorporating kinematic data from motion capture will enable angle-specific strength comparisons to better understand the mechanical adaptations to each training approach.

Keywords: Partial range of motion, Full range of motion, Knee

EFFECTS OF PARTIAL VERSUS ISOMETRIC RESISTANCE TRAINING ON PEAK ISOMETRIC ANKLE PLANTARFLEXION TORQUE IN TRAINED WRESTLERS.

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Optimizing ankle plantarflexor strength is essential for wrestling performance, yet the impact of partial range of motion combined with supramaximal loading on strength adaptations requires further research. This study examined the effects of partial range of motion (PART) versus isometric (ISOM) resistance training on maximal isometric ankle plantarflexion torque in twelve trained wrestlers (n = 12; mean age 22.4±4.6 years; mean body mass 81±21.08 kg) using a within-subject design where each leg was randomly assigned to a different training protocol. Baseline torque was assessed with an IsoForce isokinetic dynamometer (TUR GmbH, Germany) at six ankle angles (-15°, -10°, 0°, 10°, 20°, 30°; positive values indicate plantarflexion). Participants were instructed to gradually increase force over five seconds to reach maximal voluntary torque and maintain it for an additional five seconds. Following baseline assessment, an 8 week unilateral ankle plantarflexion intervention was applied: one leg performed PART training (-15° to 0°) with 5 sets of 5 repetitions at 5RM intensity in PART, while the contralateral leg underwent ISOM training at -15° for 5 sets of 5 repetitions of 5 seconds at 90% of MVC. Rest intervals between sets were 60 seconds. Post-intervention, isometric torque was reassessed, and the peak torque across all angles was extracted for analysis. Two-way repeated measures ANOVA evaluated the effects of training method (PART vs ISOM) and time (pre vs post) on maximal torque. Results showed a significant main effect of time ($F(1,11) = 72.24$, $p < .001$, partial $\eta^2 = 0.868$), with both training methods producing notable increases in maximal torque (PART: 199.07±64.94 to 250.27±62.75 Nm; ISOM: 198.44±69.06 to 258.38±69.25 Nm). No significant main effect of method ($F(1,11) = 0.40$, $p = .540$) or method × time interaction ($F(1,11) = 1.54$, $p = .241$) was observed, indicating comparable improvements for both protocols. These findings indicate that high-intensity partial range and specific fixed-angle isometric training both effectively enhance maximal ankle plantarflexor strength in wrestlers, supporting flexible training strategies tailored to athlete and sport-specific demands. Future analyses incorporating motion capture kinematics will allow angle-specific torque comparisons, providing deeper insights into the mechanical adaptations induced by each training method.

Keywords: Partial range of motion, Isometric, ankle

EFFECTS OF WARMING-UP WITH LIGHT VS. HEAVY WEIGHTED VESTS ON HORIZONTAL JUMPING ABILITY IN TRACK AND FIELD ATHLETES

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Warm-up is a training strategy performed prior to training in order to prepare athletes physicaly and mentally for the upcoming main training part. Previous studies have showed that warm-up with a weighted vest may partially lead to increases in lower body power, although the effects of warming-up with weighted vests in lower body power in track and field athletes remain unclear. Therefore, the purpose of this study was to investigate the effects of warming-up with light vs. heavy weight vests on lower body muscle power in track and field athletes. Ten track and field athletes (age: 20.0±1.5 years, height: 1.75±0.05cm, body mass: 70.60±17.04kg) all students of Department of Physical Education and Sport Science participated in the study. The experimental design had 4 days duration. During the first day, athletes visited the laboratory for anthropometric characteristics. Then during the next three nonconsecutive days athletes performed a standardized warm-up protocol either without a weighted vest (Control, C), either with a light weighted vets (LV) accounting for the 10% of their body mass, or with a heavy weighted vest (HV) accounting for 15% of their body mass. Following the warm-up and after 6 minutes of passive rest, athletes performed countermovement jump (CMJ), standing long jump, three steps long jump and a 0-40m linear sprint. Data analysis included the one was ANOVA for repeated measures, and the level of significance was set at $p \leq 0.05$. Results showed that CMJ height was significantly increased ($p=0.05$) following HV and this increase was significantly higher compared to C ($p=0.030$) and LV ($p=0.044$). Long jump remained unchanged following the three conditions ($p=0.170$) while similarly, three step long-jump ($p=0.140$) and 0-40m linear sprint ($p=0.561$) remained unchanged. These results suggest that warming-up with an HV may enhance CMJ height although this positive benefit may not be reflected in long jump, 3 step long-jump and sprint which are partially more technical demanding actions.

Keywords: weight west, horizontal jump, countermovement jump, track and field.

EVALUATION OF SELECTED PHYSICAL FITNESS INDICES IN FEMALE ADOLESCENT FREESTYLE WRESTLERS

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Adequate physical fitness is crucial in freestyle wrestling. To date, several studies have been conducted in international literature that have assessed the physical fitness profile in the wrestling sport. Most of these studies have been conducted on male wrestlers, while the studies on females are very limited. Thus, the purpose of this study was to evaluate and create a physical fitness profile in young female freestyle wrestlers. Eighteen adolescent female freestyle wrestlers were recruited to participate in the present study (age: 14.2 ± 2 years old; body height: 156.5 ± 6.4 cm; body mass: 55.2 ± 6.4 kg; arm span: 159.2 ± 8.2 cm). Flexibility of lower and upper limbs (using the sit and reach test and the back scratch test, respectively), maximal isometric handgrip strength of right and left hands (using the Kinvent hand dynamometer), maximal strength of lower limbs (using the Takei dynamometer), power of lower and upper limbs (using long jump test and medicine ball pushing test, respectively), and reaction speed (using the upper limb reaction test). Descriptive statistics and paired t-tests were used to analyze the data. According to the results of the present study, the mean performance of female young athletes was 27.5 ± 6.6 cm in the sit-and-reach test, 164.4 ± 15.4 cm in the long jump test, 5.2 ± 0.7 m in the medicine ball pushing test, 57.8 ± 22.4 kg in the lower limbs maximal strength test, and 476.1 ± 48.4 ms in the reaction speed test. Furthermore, the results of the present study reported significant differences ($p < 0.05$) in flexibility between right (3.9 ± 5.7 cm) and left (1.5 ± 10 cm) hands, as well as in maximal handgrip strength between right (31.6 ± 5.2 kg) and left (28 ± 4.9 kg) hands. In conclusion, this study presents “indicative values” for the evaluation of selected physical fitness indices in young female freestyle wrestlers that could help in the assessment and guidance of suitable training programs aimed at improving physical fitness and, consequently, improving the performance of young female wrestlers.

Keywords: Physiological Demands, Flexibility, Strength, Power, Reaction Speed, Testing

IMPACT OF COMPETITIVE SWIMMING LEVEL ON THE EFFICIENCY INDEX "STROUHAL NUMBER" DURING DOLPHIN KICKS IN PRONE POSITION

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The aim of the study was to examine the impact of competitive swimming level on the efficiency of underwater dolphin kicks in the prone position. The sample consisted of 21 swimmers: 13 high-level (>700 aquatic points: 923 – 702 aquatic points) and 8 medium-level (<700 aquatic points: 681 – 507 aquatic points). Dolphin kicks in the prone position were evaluated after turns during 50 m front-crawl or butterfly swimming performed at maximal intensity in a 25 m pool. Since each swimmer executed a different number of dolphin kicks, the mean value of the executed kicks was calculated for each variable to assess efficiency. Dolphin kicks were recorded using an underwater camera from the TEMPLO CONTEMPLAS system (100 Hz), placed on the side wall of the pool, 5 m from the wall where the turn was performed and 6 m perpendicular to the swimming direction. Two-dimensional kinematic analysis was performed using the open-access software KINOVEA (0.9.5), digitizing specific anatomical landmarks on the right side of each swimmer's body. Each dolphin kick was divided into two phases: the downkick and the upkick. To evaluate the efficiency of dolphin kicks, the Strouhal number was calculated based on kick amplitude, kick frequency, and the swimmer's mean forward swimming velocity. Statistical analysis was conducted using independent sample t-tests, revealing a significantly lower Strouhal number ($p = 0.039 < 0.05$) in high-level swimmers (0.609 ± 0.077) compared to medium-level swimmers (0.675 ± 0.041). This difference was attributed to higher kick frequency (1.93 ± 0.22 Hz vs. 1.71 ± 0.25 Hz), smaller kick amplitude (0.52 ± 0.10 m vs. 0.58 ± 0.08 m), and higher swimming velocity (1.65 ± 0.13 m/s vs. 1.45 ± 0.09m/s). The findings of the present study support the notion that effective propulsion is associated with low Strouhal numbers (in fish, typically between 0.200 and 0.400), indicating high propulsive efficiency achieved through the generation of high propulsive forces while minimizing drag.

Keywords: underwater dolphin kick, Strouhal number, kinematic analysis

MUSIC OR NO MUSIC? EFFECTS ON BENCH PRESS BARBELL VELOCITY LOSS ON RESISTANCE TRAINED PARTICIPANTS.

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During the past decades, there has been a significant amount of research that supports the use of music as an ergogenic aid during resistance training. However, scarce data exists regarding the effectiveness of music on kinematical characteristics of barbell during the bench press. Therefore, the purpose of the study was to investigate the effects of performing barbell bench chest press either with music (M) or without music (NM) in trained male participants. Eight trained male participants (age: 20.47±1.3 years mass: 78.15±8.58kg, height: 179.9±4.8cm) with 108.13±22.14kg one repetition maximum (1RM) in bench press, participated in the study. The study had a duration of four nonconsecutive days. During the first day, anthropometric characteristics were measured. During the second day, the 1RM test on the bench press and a familiarization session in medicine ball throws were performed. During the beginning of the third and fourth day, the seated medicine ball throws were performed using balls ranging from 1 to 5kg. Then, 3 sets of 8 repetitions at the 75% of 1RM with 3 min rest were performed with M or NM in a counterbalanced design. Following a 5 min rest period, a fourth set was also performed when participants reached their instant fatigue. During all sets the kinematical characteristics of the barbell were monitored (chrono jump encoder, Spain) and the percentage velocity loss (VL%) was calculated. The analysis included the paired samples T-Test, and the level of significance was set at p≤0.05. Results showed that VL% during set 1 was not different between conditions (M: -35.3±16.3% vs. NM: -39.7±7.1%, p=456), for set 2 (M: -46,7±13.0% vs. NM: -47.8±10.3%, p=0,810) for set 3 (M: -54.5±17.2% vs. NM: -53.6±11.6%, p=0,752) and for set 4 (M: -66.7±12.7% vs. NM: -65.1±9.7%, p=0,828). No difference was also found for medicine ball throws for 1kg (M: 10.2±0.6m vs. NM: 10±0.6m, p=0,097), for 2kg (M: 7.8±0.5m vs. NM: 7.7±0.6m, p=0,123), for 3kg (M: 6.4±0.4m vs. NM: 6.4±0.4m, p=0,655) and for 5kg (M: 5.0±0.4m vs. NM: 4.9 ±0.3m, p=0,135). The results of the study suggest that VL% during the bench press is not affected by the addition of music.

Keywords: music,velocity loss,bench press,power production

PERIODIZATION, PERFORMANCE PROFILES, AND PEAKING ACCURACY IN ELITE HIGH JUMP ATHLETES DURING THE 2022-2025 OLYMPIC CYCLE

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The purpose of this study was to conduct a longitudinal and multidimensional analysis of performance periodization, performance profiles, and peaking accuracy of elite high jump athletes during the 2022-2025 Olympic cycle. The sample consisted of 63 elite athletes (31 men, 32 women) who competed in the Paris 2024 Olympic Games, with data drawn exclusively from the World Athletics public database. Key performance and variability indicators were examined, included coefficient of variation, performance density, season best (SB) minus target competition performance, performance maintenance index, linear progression index, and standardized Z-scores using Repeated Measures Analysis of Variance, Wilcoxon Signed-Rank test, Pearson and Spearman correlations, independent samples t-test, and Levene's test. Results indicated that performance load follows the structure of the Olympic cycle, with 2024 recording the highest number of competitions and the highest rates of high-performance density compared to 2022, while the post-Olympic year 2025 was characterized by a clear reduction. The coefficient of variation of performances remained stable throughout the four-year period, suggesting that competitive consistency is a stable individual characteristic. Top-ranked athletes (positions 1-12) were clearly distinguished from the rest in terms of high-performance density and mean annual performance. The SB systematically exceeded target competition performance across all years ($p<0,001$), with only 12-18% of athletes matching or surpassing their SB at the target competition. Qualification method (Entry Standard versus Ranking) was not associated with differences in peaking accuracy in any year. Neither seasonal performance consistency nor the magnitude of seasonal deviation were statistically significant predictors of target competition performance. Finally, the Olympic year 2024 was characterized by a dramatic compression of performance variability ($F=376,17$, $p<0,001$), with performances converging toward individual mean levels regardless of each athlete's seasonal deviation. The findings contribute to the empirical documentation of elite-level performance planning and highlight the complexity of peaking in high jump, indicating the need for individualized tapering approaches.

Keywords: periodization,high jump,peaking accuracy,performance profile,Olympic cycle,World Athletics Ranking,tapering,performance consistency

PERIODIZED RESISTANCE TRAINING FOR ENCHANCING SKELETIKAL MUSCLE HYPERTROPHY AND STRENGTH

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Properly designing a resistance training (RT) program plays a crucial role in maximizing muscle hypertrophy and maximum strength. This review aims to evaluate the effectiveness of periodization as a training approach for developing muscle strength and hypertrophy in skeletal muscles. To this end, an analysis of the current literature was conducted, with an emphasis on systematic reviews and meta-analyses examining the comparison between periodized and non-periodized programs. Particular emphasis was placed on a review comprising 12 studies related to muscle hypertrophy, as well as on meta-analytic data concerning maximum strength. Periodization can be described as the organized and pre-planned modification of key training variables, such as volume, intensity, and type of exercises, with the aim of improving performance, managing fatigue, and avoiding plateaus. The main models applied are linear periodization (LP), reverse linear periodization, and undulating periodization (UP), which is characterized by frequent changes in training load. Available data indicate that periodized programs outperform non-periodized ones in terms of maximum strength gains, regardless of training experience level. Although the results are not entirely consistent, the undulating model appears to be associated with greater strength gains, likely due to the increased variety of training stimuli. At the same time, it cannot be ruled out that part of this superiority may also be explained by the principle of specificity. Regarding muscle hypertrophy, the findings are less clear. Linear and undulating programs appear to lead to similar adaptations, particularly in individuals with no prior training experience, while the superiority of periodization over unstructured programs is not clearly documented. Furthermore, the existing literature has certain limitations, such as the short duration of the interventions, the heterogeneity of the protocols, and the limited participation of trained individuals. Overall, periodized training appears to be an effective approach for improving muscle strength, while its effect on hypertrophy remains unclear. Further research is needed, particularly through long-term and methodologically rigorous studies, to draw more reliable conclusions.

Keywords: Training periodization, resistance training, muscle strength, muscle hypertrophy, undulating periodization

PLAYERS TACTICS ON BREAK POINT SITUATIONS ACROSS ALL TENNIS COURT SURFACES

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This study investigates the strategic behavior of elite tennis players under high psychological pressure, focusing specifically on break point (BP) situations critical moments in a match where the receiving player has the opportunity to "break" the server and drastically alter the momentum of the game. The research aims to determine whether players who win break points tend to adopt offensive or defensive tactics, depending on their role (server or receiver), and whether playing surface (clay, grass, A total of 1,475 break points were analyzed across 80 matches from all four Grand Slam tournaments. Each point was classified according to the outcome: offensive (winner, ace, forced error) or defensive (unforced error by the opponent). To examine statistical differences between groups, non-parametric tests were employed (Mann–Whitney U and Kruskal–Wallis), due to non-normal distribution and variance heterogeneity of the data. The results revealed a significant difference in tactical preference depending on the player's role. Servers showed a statistically higher tendency to win break points through offensive strategies, leveraging their initial control of the rally. Conversely, receivers were more successful when relying on defensive strategies, often winning points as a result of their opponent's unforced errors. Contrary to expectations, court surface did not significantly affect tactical choice, suggesting that psychological stress may overshadow environmental factors in high-pressure moments. The findings emphasize the importance of mental resilience, decision-making under pressure, and consistent tactical planning. This study offers valuable insights for coaches, performance analysts, and sports psychologists seeking to optimize athlete performance during the most decisive moments of competition

Keywords: tennis, break point, tactical analysis, court surface

THE ACUTE EFFECT OF UPPER AND LOWER LIMB DRY-LAND STRENGTH TRAINING ON SWIMMING PERFORMANCE

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Swimmers engage in various forms of dry-land strength training before swimming sessions to enhance their swimming performance. The acute effects of upper- and lower-limb muscular endurance training (MET) on swimming performance remain unknown. This study examined the acute effects of upper- and lower-limb MET, performed in separate sessions, on subsequent swimming performance. Twelve swimmers (15.1 ± 1.1 years, body mass: 60.0 ± 5.7 kg, body height: 169.3 ± 7.0 cm) were evaluated before the intervention for one-repetition maximum (1-RM) strength in four exercises: bench press, inclined seated row, full squat, and leg curl. Then they performed two experimental conditions in a randomized, counterbalanced order: the upper limb (UL) condition, which involved bench press on a machine and rowing on an inclined bench, and the lower limb (LL) condition, which included full squats on a machine and leg curl exercises during a dry-land MET training session (3 sets of 20 repetitions at 50% 1-RM, with 40 seconds rest between sets). In both conditions, 20 minutes after the MET, swimmers performed two swimming training tests (ST) consisting of 2 × 50 m arms-only front-crawl sprints and a 400 m front-crawl swim at 94% of their maximum effort. Swimmers were evaluated in both conditions for counter-movement jump, medicine ball throw, and isometric handgrip strength at three separate time points: before MET, after MET, and after ST. Swimming performance and kinematic variables (stroke rate, stroke length, and stroke index) were calculated for both in-water tests in each condition. Performance time in 2 x 50 m, 400 m, and kinematic characteristics did not differ between conditions ($p = 0.14$-0.95). The counter movement jump decreased in the LL only after the MET (before MET: 27.6 ± 4.6 cm, after MET: 25.8 ± 4.8 cm, $\eta p2 = 0.15$, $p = 0.02$). The medicine ball throw and isometric handgrip showed no differences between conditions or time points of measurement ($\eta p2 = 0.03$, $p = 0.50$-0.52). In conclusion, upper- and lower-limb MET, when performed in separate sessions prior to maximum arms-only and submaximal swimming tests, does not alter swimming performance or kinematic characteristics.

Keywords: muscular endurance training, upper and lower limbs, swimming performance, competitive swimming

THE EFFECT OF BATTLE ROPE TRAINING ON SPRINT SWIMMING PERFORMANCE AND UPPER AND LOWER BODY POWER

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Sprint swimming is a high-demand event in which maximal speed, power production, and efficient neuromuscular coordination determine competitive performance. As competitive swimming continues to evolve, various training methods are applied to enhance explosive strength and speed. Among these, battle rope training has attracted increasing interest; however, research data regarding its transfer to swimming performance remain limited. The aim of the present study was to investigate the effect of battle rope training on the sprint performance of university students from the Department of Physical Education and Sport Science specializing in swimming. Twenty students participated in the study (body mass: 75.68 ± 14.63 kg; body height: 174.8 ± 9.8 cm). Participants were divided into an experimental group (n = 13), which performed a battle rope training program, and a control group (n = 7), which trained using resistance bands. The intervention lasted four weeks with a frequency of two training sessions per week. The training protocol followed a variable work-to-rest ratio progressing from 1:4 to 1:2. The experimental group performed eight battle rope exercises targeting the whole body, while the control group performed corresponding exercises using resistance bands. Pre- and post-intervention assessments included a 25 m maximal sprint swim performed with a push-off from the wall, seated medicine ball throws with 2 kg and 3 kg balls, and a maximal vertical jump test. A 2 × 2 repeated measures ANOVA was applied due to the presence of two groups and two time points. The results showed a statistically significant improvement in the 25 m sprint performance in the experimental group ($F(1,18) = 7,992$; p 0.05). In contrast, no statistically significant changes were observed in the medicine ball throws or the vertical jump ($p > 0.005$). In conclusion, battle rope training appears to improve sprint swimming performance without corresponding adaptations in explosive power indicators. The absence of improvement in explosive ability may be related to the limited systematic involvement of swimmers in specialized dry-land training exercises. These findings may be useful for designing specialized strength training programs for sprint swimmers.

Keywords: Keywords: battle ropes, sprint swimming, explosive power, performance

THE EFFECT OF WARMING UP WITH HIGH VS. LOW LOAD WEIGHTED VESTS ON REACTIVE STRENGTH INDEX IN TRACK AND FIELD ATHLETES

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The last decade's, warm-up received a greater attention in order to maximize athletic performance. Studies have shown that weighted vests may acutely enhance power production in individual and team sports, however, research data in track and field athletes are scarce. The purpose of this study was to examine the effect of warming up with a weighted vest with high vs. low loads on reactive strength index and lower body explosiveness in track and field athletes. Ten track and field athletes, all students from the Department of Physical Education and Sports Science of the Democritus University of Thrace (age: 20±1,5 years, height: 1,75±0,05cm, body mass: 70,60±17,04kg) participated in three experimental warm-up conditions in random order: a) warm-up without vest (Control-C), b) with 10% of body mass vest (Light Vest-LV) and c) with 15% of body mass vest (Heavy Vest-HV). The same general and specific warm-up was applied in each condition, with the specific warm-up being performed using the corresponding vest. Following the warm-up conditions, the vest was removed and a passive rest of 6 minutes was taken before the measurements. Measurements included: the reactive strength index (RSI) from 40cm box (DJ), the counter movement jump (CMJ), 3 step long-jump and 40m linear sprint. Statistical analysis was performed using one-way repeated measures analysis of variance and the level of significance was set at $p \leq 0.05$. No significant difference was found for RSI following the three different warm-up conditions ($p=0.712$). However, CMJ height was significantly increased ($p=0.05$) following HV and this increase was significantly higher compared to C ($p=0.030$) and LV ($p=0.044$). No significant difference was found for 3 step long-jump ($p=0.140$) and 0-40m linear sprint ($p=0.561$). These results suggest that warming up with a HV may enhance CMJ height although this positive benefit may not be reflected in RSI, 3 step long-jump and sprint which are partially more technical demanding actions. More studies are needed to reach safe conclusions regarding the effects of warming up with weighted vest in athletic performance in track and field athletes.

Keywords: weighted vests, reactive strength index, CMJ, sprint

THE IMPACT OF AGE AND GENDER IN THE MOTOR COORDINATION ABILITIES OF CHILDREN PRACTICING TAEKWONDO

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While the conditional profile of Taekwondo athletes is widely documented, little or nothing is published in sports studies on motor coordination, especially related to young athletes. Taekwondo puts young athletes in the process of developing complex cognitive skills, such as thinking, identifying cause-and-effect relationships and developing creative thinking and planning skills, offering training chances in the form of motor multifaceted experiences. Additionally, it provides a variety and quantity of movements and demands in regard to coordination capabilities, using specific training methods in order to maximize performance. The study aim was to investigate the age, gender and technical level on motor coordination abilities of Taekwondo in children. One hundred and fifteen children (83 male, 32 female), aged 7.76 ± 1.71 years, divided in three different groups, under 8 (5–7 years), under 10 (8–9 years) and under 12 (10–11 years), underwent three coordination skills tests: the ruler drop test (RDT), assessing visual reaction time, the hexagonal test (HT), assessing agility, and the target kick test (TKT), assessing kicking ability. MANOVA showed significant gender differences for TKT, in which females showed higher scores than males ($p = 0.033$). Significant differences were found in HT and TKT, where the under 12 group showed higher scores than younger athletes ($p < 0.001$). No differences amongst different age groups were found in RDT, showing that this could be a good predictor of Taekwondo performance, assessed at an early stage. High-level athletes showed better scores in all the tests than the low levels, as it was expected. Coordinative performance improves with age and is positively influenced by practicing a sports activity. The predisposition to a particular sport with a well-planned training may lead to a motor proficiency comparable to that reached by older athletes and better than same-age athletes. Considering the results of this study, the assessment of technical–tactical capabilities of young Taekwondo athletes could help to plan and optimize effective youth programs and to find strategies to promote the potential of children.

Keywords: Martial arts, Maturation, Gender Differences, Reactive Time

THE IMPACT OF COVID-19 CHRISIS ON THE TREND DEVELOPMENT OF PEAK SWIMMING RESULTS IN SERBIA AND GREECE

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The sports system during Covid-19 crisis (2020-2023) underwent radical changes that significantly affected athletes' lifestyles. The 2020 was characterized by the most restrictive measures in relation to sports training systems. Each country implemented its own health prevention policies, and national sports organizations adapted training and competitions in different ways. In swimming, an open system was implemented in Serbia (SRB), where all competitive swimmers could train under standard conditions, while in Greece (GRE) the system was restrictive, except for swimmers from national teams, who periodically trained regularly. The aim of this research is to determine the effect of the Covid-19 crisis on the achievement of top swimming results in Serbia and Greece. From the database of swimming results (www.swimrankings.net), the best annual result, expresed in World of Aquatics points /WoAp/, achieved in a analysed calendar ten years (2016 – 2025) period (50m pool in the open category, for all disciplines: 50 till 1500m) in all swimming strokes (freestyle, breaststroke, backstroke, butterfly and medely) by gender (Male and Female) were analysed. Average annual results were analyzed using linear regression where the swimming results were the dependent (y) and the year of the season was the independent variable (x). For each country and each gender, performance trends over the ten-year period were calculated: GRE M and F, y=6.75x + 814.65; y=6.87x + 750.29; SRB M and F, y= -3.05x + 818.50; y=0.95x + 751.59, respectively. At the GRE male, the actual result was nominally different from the linear regression result only in 2020 (a decrease of -20.4 WoAp, as an a negative effect of -2.40%). For the GRE female, differences was find for a period from 2020 till 2022 (-19.6, -13.5 and -11.4 WoA points, -2.50, -1.71 and -1.42%, respectively); For the SRB male and female, the linear regresion and actual results were nominally different only in 2020 (a decrease of -21.3 WoAp, as an a negative effect of -2.65%, and -6.3 WoAp, -0.84%, respectively). Overall, the COVID-19 pandemic had a negative impact on elite swimming performance, with the most pronounced effect observed in 2020, corresponding to an approximate decrease of 2.5%.

Keywords: COVID effect, Training restrictions, Elite swimming performance

VELOCITY LOSS IS HIGHER FOLLOWING TRADITIONAL RESISTANCE TRAINING COMPARED TO CLUSTER TRAINING

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Traditional resistance training (TR) is considered the primary method for increasing muscular strength and muscle hypertrophy. However, one of its main limitations is the potential velocity loss (VL) due to the progressive fatigue that accumulates toward the completion of the training set. One approach to mitigating this decline in velocity is cluster training, which divides a conventional set into smaller subsets (cluster sets) with short inter-repetition rest intervals. The present study aimed to compare the effects of TR vs. cluster training consisting of three-repetitions on mean velocity (MV) during seated shoulder press performed on a Smith machine. A total of 12 participants (n = 12; age: 26.5±6.3 years; mass: 79.8±3.7 kg; height: 179.5±3.5cm) participated in the study. Participants visited the gym on three nonconsecutive days. The first session was conducted to determine each participant's one-repetition maximum (1RM) in the shoulder press in a Smith machine. During the second and third sessions, participants performed in a randomized order, the TR protocol (3 sets of 6 repetitions at 85% 1RM, with 3 minutes of rest between sets) and the cluster protocol (CL3, 3 sets consisting of two clusters of three repetitions at 85% 1RM, with 1 minute of rest between clusters and 2 minutes between sets). Mean velocity (MV) and %VL were recorded using a linear position transducer (Chrono Jump linear encoder). Statistical analysis was performed using a paired samples T-Test, with the level of significance set at $p \leq 0.05$. Significant trend was found following the first set for %VL between TR and CL3 (TR: -43,4±12,4% vs. CL3: -32,4±13,5%, p=0.053), however, significant difference was found for set 2 (TR: -47,2±9,2% vs. CL3: -38,6±14,4%. P=0.020) and set 3 (TR: -50,8±13,9% vs. CL3: -39,2±11,3%, p=0.006). Moreover, MV during sets was significantly higher for CL3, especially during the 4th, 5th and 6th repetitions of the second and third set ($p<0.05$). In conclusion, the findings of this study suggest that CL3, is more effective in maintaining higher movement velocity during the final repetitions of each set as well as preserving %VL in a lower level compared to TR.

Keywords: resistance training, shoulder press, smith machine, mean velocity

ΠΡΟΠΟΝΗΤΙΚΗ ΟΜΑΔΙΚΩΝ ΑΘΛΗΜΑΤΩΝ

EXERCISE TRAINING/COACHING IN TEAM SPORTS

A COMPARATIVE ANALYSIS OF PASSING PERFORMANCE IN COMPLEX I BETWEEN WINNING AND LOSING TEAMS IN U20 MEN'S VOLLEYBALL AT THE 2024 EUROPEAN CHAMPIONSHIP

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The aim of the present study was to record and analyze the technical skill of the finger pass in Sequence I among teams participating in the European U20 Men's Volleyball Championship, and to compare these characteristics between winning and losing teams. The sample consisted of eight matches from the semifinal and final stages of the competition. The variables examined included the type of pass, its zone or direction, the timing of execution, and the quality of the pass. Data was collected through systematic observation and recording of each action, using a specially designed protocol that included separate evaluation scales for each variable. Statistical analysis was performed using the chi-square (x^2) test through the SPSS software, with the level of significance set at $p < 0.05$. The results showed that winning teams used the jump set (finger pass with jump) more frequently, demonstrating superior performance compared to the losing teams. Regarding pass direction, significant differences were observed, with winning teams selecting zones 1 and 2 more often. In terms of timing, winners made greater use of first-tempo sets, indicating faster and more effective offensive development. Concerning pass quality, losing teams exhibited a higher frequency of poor passes, particularly those directed away from the net, whereas winning teams recorded significantly higher rates of perfect passes. These findings suggest that winning teams are likely better trained and technically more proficient, enabling quicker ball distribution and more effective execution of offensive actions. In conclusion, the appropriate selection of pass type, direction, timing, and quality appears to be a decisive factor for success, contributing to improved performance and increasing the likelihood of achieving a winning outcome.

Keywords: set direction, type of set, comparison, evaluation, analysis.

AGE-RELATED DIFFERENCES IN EXTERNAL LOAD DURING TRAINING IN YOUTH FOOTBALL PLAYERS

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The analysis of movement patterns in football indicates that a player performs a wide range of low-, moderate-, and high-intensity actions during a match, including jumps, ball strikes, tackles, turns, sprints, changes of direction, and variations in pace. High-intensity running is a critical determinant of performance, as it is closely associated with key offensive and defensive actions. The present study aimed to investigate the effect of age on the total external load experienced by young football players during all training sessions of a microcycle, an area that has not been extensively examined to date. The parameters assessed included total distance covered, distance at high-intensity speeds, distance at very high-intensity speeds (sprints), and the total number of intense accelerations and decelerations. Thirty-one youth academy football players from a Superleague 2 team participated in the study and were categorized into three age groups: U13, U15, and U17. For each participant, data were collected across three training sessions conducted within a one-week period. External load was monitored using GPS systems in all sessions to record kinetic parameters, including total distance covered, speed zones, accelerations, and decelerations. The collected data were systematically organized and classified according to age group to enable descriptive analyses and the detection of differences among groups. The results demonstrated that age significantly influences the total distance covered across all training units. Older players (U15–U17) covered greater distances at high-intensity speeds, likely due to biological maturation and enhanced aerobic and anaerobic capacities. Moreover, the total number of accelerations and decelerations was significantly higher in U17 players compared with the younger cohorts. These findings underscore the necessity of age- and position-specific training interventions to optimize player development and performance. The study contributes to the understanding of how developmental stage impacts external load in youth football and offers practical insights for coaches and sports scientists in designing targeted training protocols that accommodate age-related physiological differences.

Keywords: Biological Maturation, Training Demands, Team Sports Performance

AGREEMENT OF A THREE-FREQUENCY AND A FIVE-FREQUENCY BIOELECTRICAL IMPEDANCE ANALYZER FOR BODY COMPOSITION ASSESSMENT IN YOUNG ADULTS

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Bioelectrical impedance analysis (BIA) is widely used for assessing body composition due to its noninvasive, rapid, and practical nature in laboratory and field settings. Smaller or portable analyzers may differ from larger systems in frequency structure and impedance profiles, necessitating direct assessment of their outputs before interpretation as interchangeable. This study aimed to examine the agreement between the three-frequency Charder MA601 and the multifrequency Charder MA801 in a sex-balanced sample of young adults. Fifty young adults (25 men and 25 women) underwent body composition assessment with the Charder MA601 and MA801 bioelectrical impedance analyzers at the Physical Performance Laboratory, Department of Physical Education and Sport Science, Democritus University of Thrace. All assessments were performed during the same visit under standardized conditions. Each participant completed two measurements with each analyzer, with the mean of the two used in the final analysis. Agreement was examined using Pearson correlation coefficients and Bland–Altman analysis. Male participants had a mean age of 21.0 ± 1.3 years, height of 178.7 ± 7.6 cm, body mass of 78.2 ± 10.8 kg, and BMI of 24.5 ± 3.1 kg/m², while female participants had a mean age of 21.4 ± 1.1 years, height of 165.2 ± 6.1 cm, body mass of 58.1 ± 7.6 kg, and BMI of 21.3 ± 2.5 kg/m². Correlations across devices were uniformly high (r = 0.9982-1.0000) for body mass, BMI, fat-free mass, skeletal muscle mass, total body water, fat mass, and percentage body fat. Bland-Altman analysis showed minimal mean bias, with differences of -0.02 kg for body mass, -0.01 kg/m² for BMI, -0.15 kg for fat mass, and +0.13 kg for fat-free mass. These findings demonstrate excellent agreement between the MA601 and MA801 in young adults. The MA601 may serve as a practical field-oriented option when comparability with MA801-derived estimates is desired. However, these findings should be viewed as evidence of cross-device agreement rather than direct criterion validity, necessitating further studies against reference methods such as DXA before assuming interchangeability with criterion measures.

Keywords: Fat Mass, Body Composition, Young Adulthood, Obesity

AN ANALYSIS OF SERVE–BLOCK INTERACTION IN ELITE WOMEN'S VOLLEYBALL TEAMS IN THE 2025–2026 GREEK CHAMPIONSHIP

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The aim of the present study was to compare the technical and tactical elements (serve and block) of the teams participating in the Greek Women's A1 Championship 2025–2026 (first round). The sample consisted of six matches played by the teams that ranked in the top four positions. The variables evaluated included the type of serve, its direction and quality, in relation to the type and quality of the block, all of which belong to Complex II. Data collection was carried out through systematic observation and recording of each event (693 game actions) using a structured protocol, which incorporated a five-point rating scale for each variable. Statistical analysis was performed using the chi-square (x^2) test through the SPSS software package. The results revealed a statistically significant relationship between the direction and quality of the serve and both the type and quality of the block. In contrast, no significant relationship was found between the type of serve and the type and quality of the block. In conclusion, the findings indicate a strong association between serve direction and quality and blocking performance (type and quality). These results may be utilized by coaches to design training sessions that focus on the development of these two sequential skills within Complex II. Additionally, it is important to establish specific motor patterns that players are likely to encounter in real match situations (game actions), to enhance the effectiveness of their performance up to the final action in Complex II (counterattack).

Keywords: volleyball, observation, recording, correlation, training

ANALYSIS OF EXTERNAL AND INTERNAL DURING BASKETBALL GAME PLAY

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Basketball is a high-intensity intermittent sport that involves frequent changes in movement intensity, which vary by playing position. Inertial measurement units (IMUs) enable precise quantification of external load and, combined with heart rate monitoring, offer valuable insights for load management and training design. The aim of this study was to quantify match loads of basketball players by position and examine changes in load across game periods. Male basketball players were categorized as guards, forwards, or centers. IMU-derived external load variables included total distance, movement speed zones, accumulated acceleration load, exertions, changes of direction, and jumps. Internal load was assessed using physiological load indices, heart rate responses, and training impulse (TRIMP). Comparisons were made across quarters and between halves, and among the three positional groups. In guards, a significant decline was observed from the 1st to the 4th quarter in total distance covered (1314 ± 251 vs. 963 ± 184 m, $p < 0.001$), accumulated acceleration load (187 ± 39.78 vs. 132 ± 23.49, $p < 0.001$), and TRIMP (45.62 ± 15.16 vs. 27.00 ± 6.63, $p < 0.001$), indicating reduced match performance as the game progressed. Conversely, centers demonstrated higher relative intensity than guards and forwards. They showed greater distance per minute in both the 1st half (119 ± 10.5 m/min vs. 104 ± 13.02 and 96.55 ± 10.15, $p = 0.004$) and 2nd half (128 ± 16.87 vs. 102 ± 9.57 and 97.35 ± 16.08 m/min, $p < 0.001$). Centers also recorded higher very-high-speed distance per minute and greater physio intensity in both halves (all $p \leq 0.036$). IMU technology reveals distinct positional profiles and a substantial decline in several external and internal load indicators as the game progresses. These findings support the use of IMU-derived metrics for individualized training prescription, targeted recovery strategies, and optimization of competitive performance in basketball.

Keywords: Inertial Measurement Units (IMUs), Playing Position, External Load

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (IRONMAN- ΥΠ3ΤΑ-0561410). In the abstract, all the IRONMAN consortium members participated.

ANALYSIS OF HOME COURT ADVANTAGE IN GREEK WOMEN'S BASKETBALL. A LONGITUDINAL STUDY

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Home-court advantage in basketball is one of the most studied phenomena because it significantly influences team performance and outcomes. Until recently, research on home court advantage in women's basketball has been limited. In recent years, however, research interest has increased, with new studies examining the phenomenon under different conditions. This study aimed to analyze the evolution of home court advantage in the Greek women's basketball league (A1 category) over a decade. The sample included games from 2014–2015 to 2023–2024, excluding the 2019–2020 season due to the COVID-19 pandemic. A total of 850 unique games were analyzed, with 1,900 team observations made. The home advantage percentage (HA%) was calculated for each team and season. Data normality was assessed using the Shapiro-Wilk test, and season comparisons were made with the nonparametric Kruskal-Wallis test. Results revealed statistically significant differences in HA% across seasons ($H = 19.18$, $p = 0.0139$), with a moderate effect size (Rank $\eta^2 = 0.1257$). These findings indicate that home advantage in Greek women's basketball is not constant but varies notably between seasons. Understanding this dynamic can help improve game strategy planning and the evaluation of team performance.

Keywords: Home court advantage, women's basketball, performance analysis, longitudinal study

ARE RPE AND SESSION-RPE INTERCHANGEABLE FOR ACUTE: CHRONIC LOAD MONITORING IN WOMEN'S BASKETBALL ACROSS MICROCYCLES?

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Internal training load monitoring is widely used to guide the training process, optimize performance, and reduce the risk of injury or overtraining. The use of the acute:chronic workload ratio has been proposed as a practical approach to quantify changes in load across microcycles. However, it remains unclear whether different internal load metrics, such as RPE and session-RPE, provide interchangeable information when calculating acute: chronic load. Six women's basketball players were monitored over a 7-week in-season training period. Internal training load was recorded for each session using RPE and session-RPE, with session-RPE calculated as the product of RPE and session duration. Acute: chronic load was quantified using a 2/7 ratio based on daily internal load values to detect differences across competitive microcycles. The relationship between RPE and session-RPE was examined using Pearson's correlation coefficient, and differences between the two metrics were assessed using paired-samples t-tests. Across the 7-week monitoring period, a very strong positive correlation was observed between RPE and session-RPE (Pearson's r = 0.90). Despite this strong association, paired-samples t-tests revealed statistically significant differences between the two metrics (p = 0.03), indicating that RPE and session-RPE do not provide identical information when used to characterize internal load across microcycles. In women's basketball, RPE and session-RPE show a very strong correlation but are not interchangeable when monitoring internal load using a 2/7 acute: chronic ratio. Practitioners should be consistent in their choice of internal load metric and cautious when comparing or replacing RPE with session-RPE in the context of load monitoring for performance optimization and injury risk management. There remains a need to evaluate a better market for long-term monitoring of internal load.

Keywords: Training Load, Internal Load, Overtraining

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (IRONMAN- ΥΠ3ΤΑ-0561410). In the abstract, all the IRONMAN consortium members participated.

ASSOCIATION BETWEEN BALL REVERSAL AND OFFENSIVE PERFORMANCE IN THE 2025 EUROPEAN U20 BASKETBALL CHAMPIONSHIP

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Performance analysis in basketball is an essential tool for understanding game factors that contribute to team success. Ball movement, and particularly ball reversal, is considered a key part of offensive strategy and effectiveness, disrupting defensive structures and creating scoring opportunities. However, its relationship with offensive effectiveness and match outcomes remains unclear in youth competitions. This study aimed to examine how ball reversal impacts game outcomes and offensive efficiency during the 2025 European U20 Basketball Championship. Offensive possessions from all 40 tournament games were systematically recorded and analyzed using Lince PLUS observation software. Ball reversal was categorized into four levels: none, one, two, and more than two, while offensive effectiveness was evaluated by points per possession. Statistical analysis was carried out using contingency tables and chi-square (χ^2) tests of independence to explore the relationship between ball reversals and game outcomes (win-lose), and Kruskal–Wallis tests to examine their connection with points per possession. The results revealed that the most common offensive possessions involved zero or one-ball reversals. Ball reversal was significantly associated with game outcome ($\chi^2 = 17.696$, $p < 0.001$), with possessions involving more than two ball reversals being more frequent among winning teams. However, the difference in possession efficiency across the various levels of ball reversal was not significant, although a weak trend was observed ($H = 6.478$, $p = 0.091$). The highest efficiency was observed at one ball reversal (0.97 points per possession), followed by possessions with more than two ball reversals (0.94 points per possession). These findings suggest that while greater ball movement may be more commonly observed in successful teams, the number of ball reversals alone does not substantially affect the efficiency of individual possessions, highlighting the importance of considering not only the frequency but also the contextual and tactical characteristics of ball movement within the tactical structure.

Keywords: ball reversal, basketball, points per possession, performance analysis, efficiency.

ASSOCIATIONS OF PRE- TO POST-MATCH MENTAL FATIGUE CHANGES WITH GPS-DERIVED EXTERNAL LOAD METRICS IN SOCCER PLAYERS

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Mental fatigue has been proposed as a factor that may influence performance in team sports; however, its association with match-derived external load metrics remains insufficiently understood. The purpose of the present study was to examine the relationships between pre- to post-match changes in mental fatigue indicators and GPS-derived locomotor variables in soccer players. A total of 100 observations were included in the study. Mental fatigue was assessed through cognitive-performance indices, including percentage changes in reaction time, response variation, and rate of correct scores (RCS), with higher reaction time and variation and lower RCS interpreted as poorer cognitive performance. External load was monitored during match play using GPS technology, and the following variables were analyzed: total distance, distance per minute, high-speed running plus sprint distance, high-speed running distance, sprint distance, maximal speed, accelerations in Zone 5–6, decelerations in Zone 5–6, and high metabolic load distance. Pearson's correlation coefficients were calculated to determine the associations between mental fatigue indicators and GPS metrics. The results showed that, among the GPS-derived variables, accelerations in Zone 5–6 were significantly correlated with percentage change in reaction time, percentage change in variation, and percentage change in RCS (all $p < .05$). In addition, decelerations in Zone 5–6 were significantly correlated with percentage change in RCS ($p < .05$). These findings indicate that players who performed more high-intensity accelerative actions tended to exhibit modestly poorer cognitive responses, whereas the remaining running outputs were not related to mental fatigue indices. In conclusion, pre- to post-match changes in mental fatigue indicators may be more closely associated with high-intensity accelerative and decelerative actions than with general external load volume, although the observed relationships were small and should be interpreted with caution.

Keywords: mental fatigue, soccer, GPS metrics, external load, cognitive performance, match demands

BODY COMPOSITION VARIATION ACROSS STUDY YEARS IN FEMALE PHYSICAL EDUCATION AND SPORT SCIENCE STUDENTS

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Body composition in university students reflects the interaction of health behaviors, habitual physical activity, and lifestyle-related factors, which may change over the academic years. This issue may be particularly relevant in female Physical Education and Sport Science students, whose studies combine theoretical education with practical and sport-based coursework. Therefore, the present study, conducted in Komotini, Greece, examined whether major body composition variables differed across study years among female students of the Department of Physical Education and Sport Science. Body composition was assessed by multi-frequency bioelectrical impedance analysis using the MA801 Body Composition Analyzer (Charder Medical Co., Taichung City, Taiwan), and one measurement per participant was retained for analysis. The sample comprised 48 female students, with 12 students in each study year. Between-year comparisons were performed for body weight, fat mass, fat-free mass, skeletal muscle mass, percentage body fat, body mass index, fat mass index, and fat-free mass index using one-way analysis of variance. Significant differences were observed for body weight, fat mass, fat-free mass, skeletal muscle mass, percentage body fat, body mass index, fat mass index, and fat-free mass index (all $p < .05$). Descriptively, second-year students showed the highest adiposity-related values, including fat mass (22.30 ± 7.64 kg), percentage body fat (31.07 ± 4.90%), and fat mass index (7.97 ± 2.59 kg/m²), whereas third-year students presented the lowest values for body weight (51.98 ± 5.91 kg), fat-free mass (39.23 ± 2.78 kg), skeletal muscle mass (21.18 ± 1.62 kg), body mass index (19.80 ± 2.28 kg/m²), and fat-free mass index (14.94 ± 1.01 kg/m²). Post hoc analysis indicated that the clearest differences were observed mainly between the second and third years, while fourth-year students also had higher body weight, fat-free mass, and skeletal muscle mass than third-year students. These findings suggest that body composition may vary across study years in female Physical Education and Sport Science students; however, the limited sample size warrants cautious interpretation.

Keywords: Body Composition, Bioelectrical Impedance Analysis, Female University Students, Physical Education And Sport Science, Study Year, Greece

COMPARISON OF BODY COMPOSITION ACROSS STUDY YEARS IN MALE PHYSICAL EDUCATION AND SPORT SCIENCE STUDENTS

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Body composition is a relevant indicator of nutritional and fitness status among university students, while physical activity and fitness levels may vary across educational contexts and study demands. In Physical Education and Sport Science programs, where practical coursework is integral to training, it is worth examining whether body composition differs across study years. Thus, the present study, conducted in Komotini, Greece, compared major body composition variables among male students of the Department of Physical Education and Sport Science across years of study. Body composition was assessed by multi-frequency bioelectrical impedance analysis using the MA801 Body Composition Analyzer (Charder Medical Co., Taichung City, Taiwan), and one measurement per participant was retained. The final sample included 48 male students with known study year: 1st year (n = 12), 2nd year (n = 12), 3rd year (n = 12), and 4th year (n = 12). One-way analyses of variance were performed for body weight, fat mass, fat-free mass, skeletal muscle mass, percentage body fat, body mass index, fat mass index, and fat-free mass index. Descriptively, 1st-year students showed a leaner profile than 4th-year students, with lower fat mass (9.36 ± 4.30 vs 13.25 ± 7.51 kg), percentage body fat (12.17 ± 4.80 vs 15.92 ± 7.01%), and fat mass index (3.18 ± 1.34 vs 4.52 ± 2.36 kg/m²), whereas body weight, fat-free mass, skeletal muscle mass, and fat-free mass index were broadly comparable. However, no statistically significant differences were found between study years in any variable (all $p > .05$), including fat mass [$F(3,44) = 0.88$, $p = .464$], percentage body fat [$F(3,44) = 0.89$, $p = .456$], and fat mass index [$F(3,44) = 0.78$, $p = .514$]. These findings indicate that male students did not differ significantly in body composition according to study year. Although the descriptive pattern suggested a leaner profile in earlier-year students, this interpretation remains tentative because physical activity was not directly assessed.

Keywords: Body Composition, Bioelectrical Impedance Analysis, University Students, Physical Education And Sport Science, Study Year, Male Students

COMPARISON OF BODY COMPOSITION BETWEEN FEMALE PHYSICAL EDUCATION AND SPORT SCIENCE STUDENTS AND FEMALE STUDENTS FROM OTHER ACADEMIC DEPARTMENTS

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Body composition differences across university student groups may be associated with discipline-specific patterns of physical activity, exercise participation, and lifestyle behavior. In this context, comparing female students in Physical Education and Sport Science with those in other academic departments may provide useful insights into discipline-related variation in adiposity and lean mass characteristics. Accordingly, the present study, conducted in Komotini, Greece, examined between-group differences in major body composition variables. Body composition was assessed by multi-frequency bioelectrical impedance analysis using the MA801 Body Composition Analyzer (Charder Medical Co., Taichung City, Taiwan), and one measurement per participant was retained for analysis. The final sample included 75 female students with known departmental affiliation, of whom 50 were enrolled in Physical Education and Sport Science and 25 in other departments. Between-group comparisons were performed for body weight, fat mass, fat-free mass, skeletal muscle mass, percentage body fat, body mass index, fat mass index, and fat-free mass index using one-way analysis of variance. Statistically significant differences were observed for percentage body fat [$F(1,73) = 5.27$, $p = .025$] and fat mass index [$F(1,73) = 4.60$, $p = .036$], with female students of Physical Education and Sport Science showing lower values than students from other academic departments. Descriptively, percentage body fat was 25.59 ± 4.89% in the Physical Education and Sport Science group and 29.27 ± 8.17% in the non-Physical Education and Sport Science group, whereas fat mass index was 5.61 ± 1.72 and 6.96 ± 3.48 kg/m², respectively. Differences in fat mass and visceral adiposity showed a similar direction but did not reach statistical significance. Overall, the findings suggest a more favorable adiposity profile among female Physical Education and Sport Science students than among female students from other departments. However, interpretation should be cautious given the relatively small and unequal group sizes, and physical activity and exercise participation were not directly evaluated.

Keywords: Body Composition, Bioelectrical Impedance Analysis, Female University Students, Physical Education And Sport Science, Adiposity, Greece

COMPARISON OF BODY COMPOSITION BETWEEN MALE PHYSICAL EDUCATION AND SPORT SCIENCE STUDENTS AND MALE STUDENTS FROM OTHER ACADEMIC DEPARTMENTS

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Body composition in university students is shaped by habitual physical activity, lifestyle behaviors, and the broader educational context, while students enrolled in physical education appear to be more physically active than peers from other fields of study. Against this background, the present study, conducted in Komotini, Greece, examined whether male students from the Department of Physical Education and Sport Science differed from male students enrolled in other academic departments in major body composition variables. Body composition was assessed by multi-frequency bioelectrical impedance analysis using the MA801 Body Composition Analyzer (Charder Medical Co., Taichung City, Taiwan), and one measurement per participant was retained for analysis. The final sample included 65 male students with known departmental affiliation, of whom 40 were enrolled in Physical Education and Sport Science and 25 in other departments. Group comparisons were performed for body weight, fat mass, fat-free mass, skeletal muscle mass, percentage body fat, body mass index, fat mass index, fat-free mass index, appendicular skeletal muscle index, and visceral fat area using one-way analysis of variance. No statistically significant between-group differences were observed in any of the examined variables (all $p > .05$). The closest finding to statistical significance was noted for fat-free mass index, which tended to be higher in Physical Education and Sport Science students than in students from other departments (20.68 ± 1.48 vs 19.93 ± 2.20 kg/m²; $F(1,63) = 1.99$, $p = .164$). Overall, the findings do not support clear differences in body composition between male students of Physical Education and Sport Science and their peers from other departments within the present sample. However, the small and unequal group sizes should be considered when interpreting these results, while the slightly more favorable numerical profile observed in the Physical Education and Sport Science group remains descriptive. In addition, because physical activity and exercise participation were not directly assessed, no inference can be made regarding the mechanisms underlying the observed pattern.

Keywords: Body Composition, Bioelectrical Impedance Analysis, University Students, Physical Education And Sport Science, Male Students, Greece

COMPARISON OF WHOLE-BODY AND SEGMENTAL PHASE ANGLE ACROSS STUDY YEARS IN PHYSICAL EDUCATION AND SPORT SCIENCE STUDENTS

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Phase angle, derived from bioelectrical impedance analysis, is considered a sensitive indicator of cellular integrity, nutritional status, and physical fitness, and has been associated with muscle strength and aerobic fitness in different populations. In students of Physical Education and Sport Science, whose studies combine academic requirements with practical and sport-based coursework, phase angle may provide useful information on potential differences in physical status across study years. Therefore, the present study, conducted in Komotini, Greece, examined whether whole-body and segmental phase angle differed across study years among students of the Department of Physical Education and Sport Science. Phase angle was assessed by multi-frequency bioelectrical impedance analysis using the MA801 Body Composition Analyzer (Charder Medical Co., Taichung City, Taiwan), and one measurement per participant was retained for analysis. The final sample consisted of 96 students with available year-of-study data, including 12 male and 12 female students from each academic year (first through fourth).Between-year comparisons were performed for the whole-body, right arm, left arm, right leg, and left leg phase angles using a one-way analysis of variance. No statistically significant differences were observed for whole-body phase angle [$F(3,94) = 2.15$, $p = .102$], right arm phase angle [$F(3,94) = 1.37$, $p = .258$], or left arm phase angle [$F(3,94) = 1.79$, $p = .158$]. In contrast, significant between-year differences were identified for right leg phase angle [$F(3,94) = 3.01$, $p = .036$] and left leg phase angle [$F(3,94) = 3.21$, $p = .029$]. Descriptively, first-year students showed the highest values for right leg (6.59 ± 0.83°) and left leg phase angle (6.63 ± 1.07°), whereas third-year students displayed lower corresponding values (5.69 ± 0.63° and 5.68 ± 0.66°, respectively). Post hoc analysis indicated that the clearest differences were observed between the first and third study years in both lower-limb measures. These findings suggest that lower-limb phase angle may vary across study years in Physical Education and Sport Science students; however, the small sample sizes, the lack of physical activity evaluation,and the influence of sex should be considered when interpreting the results.

Keywords: Phase Angle, Bioelectrical Impedance Analysis, Physical Education And Sport Science Students, Segmental Analysis, Study Year, Greece

CORRELATION ANALYSIS BETWEEN KINEXON LPS AND AI-BASED MULTI-CAMERA TRACKING SYSTEMS FOR PLAYER MONITORING IN BASKETBALL

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Accurate tracking of player movement is essential for performance analysis, load monitoring, and injury prevention in basketball. This study investigates the correlation between a Kinexon Local Positioning tracking system and an AI-driven multi-camera tracking system deployed on a basketball court. The camera-based system consists of four synchronized action cameras positioned around the court, enabling full spatial coverage. Through a calibration process, the cameras are geometrically aligned to a shared coordinate system, allowing reconstruction of player positions in the 3D space of the court. The proposed vision-based system exploits computer vision techniques for player detection and identification within each camera frame. Using multi-view geometry and data fusion, individual player trajectories are projected onto the court, enabling continuous tracking without the need for wearable devices. This approach provides a non-invasive and scalable alternative to traditional sensor-based systems. To evaluate the reliability of the camera-based method, we compared it with the Kinexon LPS system across three key performance metrics: total distance covered, acceleration, and deceleration. The correlation coefficients between the two systems were found to be 0.93 for distance, 0.91 for acceleration, and 0.93 for deceleration, indicating a strong agreement. The results demonstrate that AI-based multi-camera tracking can achieve high accuracy comparable to established LPS systems. Additionally, camera-based approaches offer several advantages, including reduced reliance on wearable hardware, lower maintenance costs, and the ability to extract richer contextual information such as tactical formations and player interactions. In conclusion, the integration of calibrated multi-camera systems with AI-based tracking presents a promising solution for sports analytics. The high correlation values validate its applicability in real-world scenarios, suggesting that such systems can complement or even replace traditional tracking technologies in basketball performance analysis.

Keywords: Key Performance Metrics, Markerless Technology, Training Load

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (DLiS- ΥΠ3ΤΑ– 0559995). In the abstract, all the DLiS consortium members participated.

CORRELATION ANALYSIS BETWEEN LOCAL POSITIONING SYSTEMS (LPS) AND INERTIAL MEASUREMENT UNITS (IMU) FOR PERFORMANCE METRICS IN BASKETBALL

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Accurate quantification of athletic performance in basketball is essential for optimizing training, monitoring workload, and reducing injury risk. This study investigates the correlation between a Local Positioning System (LPS) and wearable Inertial Measurement Units (IMUs) in capturing key performance indicators during competitive basketball gameplay. The analysis focuses on three metrics: total distance covered, number of jumps, and high-intensity jumps exceeding 30 cm. The two systems rely on distinct sensing principles. LPS provides spatial tracking via radio-frequency localization, enabling continuous monitoring of players' positions across the court. In contrast, IMUs measure motion dynamics using accelerometers, gyroscopes, and magnetometers, capturing detailed biomechanical information. Performance events are identified through analytical processing of sensor data. Specifically, jump events in IMUs are detected using vertical acceleration patterns and flight-time estimates, whereas LPS-derived events rely on positional changes and inferred vertical displacement. Distance is computed through trajectory reconstruction in LPS and motion integration in IMUs. To assess the level of agreement between the two systems, correlation analysis was conducted across the selected metrics. The results demonstrate strong correlations for distance ($r = 0.8846$), jumps ($r = 0.8215$), and jumps exceeding 30 cm ($r = 0.7980$). These findings indicate a high level of consistency, particularly for distance measurements, while the slightly lower correlations in jump-related metrics may be attributed to differences in event-detection sensitivity and sensor resolution. The results highlight the complementary strengths of both technologies. LPS systems excel in capturing spatial and tactical information, whereas IMUs provide detailed insights into explosive movements and biomechanical performance. IMUs offer a portable and infrastructure-independent solution, while LPS enables comprehensive court-level tracking. In conclusion, the observed correlations support the validity of both systems for basketball performance monitoring. Their combined use has the potential to enhance data accuracy and provide a more comprehensive understanding of athlete performance in real-game conditions.

Keywords: Basketball, Local Positioning System, Inertial Measurement Units, Performance Monitoring, Athlete Tracking

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (DLiS- ΥΠ3ΤΑ– 0559995). In the abstract, all the DLiS consortium members participated.

CORRELATION BETWEEN AEROBIC CAPACITY, MUSCULAR POWER AND BODY COMPOSITION IN FEMALE BASKETBALL PLAYERS

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Abstract Basketball is a sport characterized by multidirectional movements, including multiple jumps, repeated short distance sprints, and sudden changes of direction. Body composition, speed, jumping ability, and aerobic capacity play a leading role in an athlete's performance on the court. However, the link between these variables in female basketball players is scarce. The aim of the study was to investigate the correlation between aerobic capacity, muscular power and body composition in female basketball players. Eleven female athletes participated in the study (age: 20±2 years, mass: 70.3±12.4kg, height: 1.73±0.1m). During two nonconsecutive athletes visited the laboratory for the evaluation of body composition (Dual-Energy X-ray Absorptiometry, DEXA) and 15-second repeated jumps (optojump next) while during the second day their aerobic capacity was measured. The Pearson r correlation coefficient was used, and the level of significance was set at p≤0.05. Significant correlation were observed between VO2MAX and CMJ height percent loss (r: 0.667 , p: 0.025) , VO2MAX with total lean mass (r: -0.609, p: 0.047) and trunk lean mass (r: -0.667, p: 0.025) total distance covered during the YoY o test with CMJ height percent loss (r: 0.667, p: -0.025) and total lean mass (r:-0.609, p: 0.047) , maximum speed during the Yo Yo test and percent fat (r: 0.779, p: 0.005). The study's findings indicate that aerobic capacity was significantly associated with body composition and the percentage loss in CMJ jump height. Similarly, the total distance covered during the aerobic test showed a meaningful relationship with both the percentage loss in CMJ jump height and lean body mass. Overall, the results suggest that female basketball players with higher aerobic capacity may exhibit a lower percentage decline in CMJ performance. At the same time, athletes with greater lean body mass appear to demonstrate lower aerobic capacity. These findings may contribute to the development of more effective training programs for female basketball players. Improving aerobic capacity may support the ability to sustain repeated power efforts, such as vertical jumping.

Keywords: Keywords: Basketball, aerobic capacity, body composition, VO2MAX

CORRELATION BETWEEN SESSION RATING OF PERCEIVED EXERTION, HEART RATE, AND CARDIO LOAD IN FEMALE BASKETBALL PLAYERS ACROSS TWO OFFICIAL MATCHES

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Monitoring internal training load is crucial for optimizing performance and recovery in team sports such as basketball. Common indicators, including session rating of perceived exertion (sRPE), heart rate (HR), and cardio load, provide valuable insights into athletes' physiological and perceptual responses. This study examined relationships among sRPE, average heart rate (HRavg), and cardio load, as measured by Polar Team Pro, in 10 semi-professional female basketball players (1.73 ± 6.4 cm, 69.4 ± 12.4 kg, 20.5 ± 1.17 yrs) during two official games of the 2025-2026 championship. Data normality was assessed with the Shapiro–Wilk test, and Pearson correlation analysis was used to evaluate relationships among these variables. Results showed a very strong positive correlation between HRavg and cardio load ($r = 0.840$, $p < 0.001$), indicating strong agreement among heart rate-derived measures. Cardio load and sRPE were also strongly correlated ($r = 0.769$, $p < 0.001$), suggesting that cardio load closely reflects perceived exertion. The correlation between HRavg and sRPE was moderate ($r = 0.534$, $p = 0.023$), indicating some variability between subjective and physiological responses. These findings suggest that while sRPE is practical and informative, it does not closely align with heart rate responses. Cardio load provides a more robust representation of both physiological and perceptual demands during competition. Combining subjective (sRPE) and objective (HR-based) metrics is recommended for a comprehensive assessment of internal load in female basketball players.

Keywords: SRPE, Heart Rate, Cardio Load, Internal Load

CORRELATION OF SUBJECTIVE WELLNESS AND TRAINING LOAD WITH NEUROMUSCULAR FUNCTION OF HIGH-LEVEL GOALKEEPERS IN FOOTBALL

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In team sports the main objective of the training process is to manage the stimuli to optimize team performance. To monitor the training load there are objective tools (GPS, HR monitors) but also subjective tools (Hooper questionnaire for wellness and RPE). Apart from the training load the resend research suggests that assessing neuromuscular fatigue through jumping tests offers a new potential to evaluate the effect of the training process. Currently, there is a lot of research concerning training load and fatigue in football but in the most cases the goalkeepers are excluded. Then the purpose of this study is to examine the correlations between subjective wellness score and training load with the performance on different jumping tests that target evaluating neuromuscular fatigue. The participants were three professional goalkeepers from the 2nd greek division. The training load was monitored daily with Hooper questionnaire (1-7 likert scale) and RPE (1-10 borg scale) and CMJ, DJ and 10/5 tests executed on a time mat (Chronojump) to assess the neuromuscular fatigue. The data was gathered for one month during the competitive season. The analysis revealed correlations between the different neuromuscular fatigue tests (CMJ, DJ, DJ RSI, 10/5 RSI). From Hooper questionnaire, “fatigue” had correlations with all the wellness parameters except DJ RSI, “sleep” correlated with DJ but RPE and “soreness” didn’t show any correlation with the jumping tests. Interestingly, the RPE also didn’t reveal any correlation with the neuromuscular monitoring, contrary to the field football players. As a conclusion, the neuromuscular monitoring seems to be predicted by the subjective wellness responses for goalkeepers, similarly to previous research in field players, with different variations between the examined parameters. Furthermore, the lack of correlations for RPE should be investigated further.

Keywords: Jumping Evaluation, Reactive Strength Index, Hooper Questionnaire, RPE

CORRELATIONS AMONG HEART RATE INDICES BEFORE AND AFTER MATCH PLAY IN MALE FUTSAL PLAYERS

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Heart Rate Variability (HRV) serves as a key indicator of the body's ability to adapt to and recover from intense physical exertion. This measure is influenced by the autonomic nervous system; however, prior exercise sessions may also affect HRV outcomes. The purpose of the study was to investigate the correlations between HRV metrics before and after a futsal game in male players. Fourteen futsal players participated in this study, organized into two teams consisting of seven players each. HRV was monitored prior to the initiation of the game to establish baseline physiological parameters. For HRV data collection, a Polar Pro wearable belt containing sensors and a detachable tracker was used. Players remained lying on the field for 5 minutes, and the recording of the HRV started. The same procedure was conducted at the end of the 2×20-minute game. After data extraction, the collected values included HRV, measured as the Root Mean Square of Successive Differences (RMSSD), average RR interval (the difference between two consecutive heartbeats), and minimum and maximum RR. The Pearson correlation coefficient was utilized in the analysis. Significant correlations were identified between HRV (RMSSD) and average RR (pre-game: r = 0.81; post-game: r = 0.65), between average RR and minimum RR (pre-game: r = 0.66; post-game: r = 0.66), and between maximum RR pre-game and maximum RR post-game (r = 0.84). The current results reveal strong positive correlations between HRV and indices derived from the RR interval in futsal players, both before and after assessment. From a practical perspective, the significant interrelationships observed indicate that simple metrics based on the RR interval, which are easier to measure in field settings, can be effectively used by practitioners and coaches. These metrics may assist in monitoring athletes' recovery status, adapting training loads, and evaluating overall readiness, particularly in high-intensity, intermittent sports like futsal.

Keywords: Futsal, Heart Rate, Male Athletes.

CORRELATIONS BETWEEN BIOLOGICAL MATURATION, BODY COMPOSITION AND PHYSICAL PERFORMANCE IN YOUTH TEAM-SPORT ATHLETES

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Biological maturation, body composition and muscular strength are key determinants of physical performance in youth team sports. Understanding how these factors interrelate may help optimize talent identification and training design in young athletes.Ninety children, basketball, volleyball and soccer athletes were assessed. Maturity status was estimated using age at peak height velocity (Aphv). Anthropometric and body composition measures included body mass index (BMI), body fat percentage and lean mass (kg). Physical performance was evaluated using handgrip strength and standing long jump. Pearson correlation coefficients were calculated among all variables. Aphv showed a strong positive correlation with lean mass (r = 0.78) and moderate positive correlations with handgrip strength (r = 0.50) and long jump (r = 0.57), indicating that more mature children tended to have greater muscle mass and better strength and power performance. BMI correlated strongly with body fat percentage (r = 0.70) and moderately with lean mass (r = 0.56), but only weakly with handgrip strength (r = 0.22) and weakly and negatively with long jump performance (r = −0.22). Body fat percentage presented a moderate negative correlation with long jump (r = −0.39) and negligible correlations with lean mass (r = 0.02) and handgrip strength (r = 0.03). Lean mass was moderately and positively correlated with handgrip strength (r = 0.53) and long jump (r = 0.36). Handgrip strength and long jump were moderately and positively associated (r = 0.39).In youth team-sport athletes, more advanced biological maturation and higher lean mass are associated with superior strength and power performance, whereas higher body fat is associated with reduced jump performance. BMI reflects both fat and lean components and shows limited value as an isolated indicator of physical performance. These findings highlight the importance of considering maturity status and detailed body composition, rather than BMI alone, when evaluating and monitoring physical fitness in young basketball, volleyball and soccer players.

Keywords: Age at Peak Height Velocity, Strength, Basketball, Volleyball, Soccer

DO SCRIMMAGE DRILLS REPLICATE EXTERNAL LOAD MATCH DEMANDS IN BASKETBALL?

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The objective of this study was to compare external load demands between training sessions, scrimmages and official match-play in basketball players. Basketball is characterised by high-intensity intermittent actions, and training tasks are often designed to replicate the physical demands of competition. However, previous research has demonstrated that external load responses may vary between training and competitive contexts. Typically, competition imposes greater physiological and mechanical demands, though these responses are susceptible to variability due to constraints such as player numbers, court dimensions, and drill structure. Fourteen semi-professional players were monitored over a four-week in-season period, including four official matches and corresponding training scrimmage sessions. External load variables, including distance per minute (distance/min) and accumulated acceleration load per minute (AAL/min), were calculated using an inertial measurement unit system. For each player, mean values from scrimmage and match conditions were compared using paired-samples t-tests. Significant differences were observed between conditions, with both distance/min (96.86 vs 92.72, t = 2.96, p = 0.011) and AAL/min (14.60 vs 13.60, t = 2.98, p = 0.011) being higher during scrimmage compared to official matches. These findings contrast with previous studies reporting greater loads during competition, suggesting that appropriately designed scrimmage drills may replicate or even exceed match demands. It should also be noted that external load demands are influenced by multiple context-related factors, such as the team's level relative to its opponents, competitive goals, playing style, congested playing time, and the continuous duration of participation during matches, which can vary significantly between training and official matches. Coaches can use structured forms of training drills to meet or exceed the demands of competition, supporting performance development and load management strategies.

Keywords: Basketball, Scrimmage, External Load

EFFECT OF 4-WEEKS ECCENTRIC TRAINING PROGRAM ON HAMSTRING-TO-QUADRICEPS RATIO IN FEMALE BASKETBALL PLAYERS

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Basketball is a high intensity team sport which includes repeated explosive movements. A high rate of lower extremity injuries has been reported in women's basketball mainly because of the poor hamstring-to-quadriceps ratio. Eccentric exercise may strengthen lower body strength asymmetries although the data are scarce in female basketball players. The purpose of the study was to investigate the effects of 4-weeks eccentric based training on hamstring-to-quadriceps ratio in well trained basketball players. Eleven female players (age: 19.3±1.1 years; mass: 70.3±11.8kg; height: 1.73±0.06m) participated in the study. Players visited the laboratory and the basketball court on two different days. During the first day, isokinetic torque at 60° knee extensors and flexors was measured. During the second day, countermovement jump (CMJ), 0-20m linear sprint and T-Test agility were measured. Following the initial measurements players were divided according to their hamstring-to-quadriceps ratio to eccentric group (EG, n=7) and control (C, n=4). Then, 4 weeks of eccentric exercise followed, including Nordic, reverse Nordic and Kettlebell swings completing 2 training sessions per week. Measurements were repeated after the end of the training program. A 2-way ANOVA was used for the statistics, and the level of significance was set at $P \leq 0.05$. No significant differences were found for all performance measurements within and between groups ($p > 0.05$). However, EG tended to increase the hamstring-to-quadriceps ratio for the right (from 48.9±8.5% to 56.1±5.2%; $p = 0.079$) and left leg (from 47.8±4.5% to 52.0 ± 4.8%; $p = 0.105$). In addition, percentage comparison between groups showed that EG increased the hamstring-to-quadriceps ratio compared to C (right leg: EG: 16.7±15.1% vs. C: 0.5±0.6%, $p = 0.03$; left leg: EG: 9.1±9.7% vs. C: -4.0±15.0%, $p = 0.185$). In conclusion, the results of the study suggest that eccentric exercise may improve the hamstring-to-quadriceps ratio and consequently may lead to enhanced performance and injury prevention. Two training sessions per week of Nordic, reverse Nordic and Kettlebell swings may be added to the training programs of female basketball players.

Keywords: Key words: Nordic, kettlebell swings, isokinetic torque, performance tests.

EFFECTS OF 7 WEEKS OF INSTABILITY STRENGTH TRAINING ON PHYSICAL FITNESS IN MALE ADOLESCENT SOCCER PLAYERS

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Strength training is a key factor for success in soccer. Studies have showed that especially in adolescent players strength training should be a major component when designing training programs. However, during the past decades, strength training under unstable conditions (i.e. on a Bosu ball) has gained popularity in order to strengthen core muscles, improve balance, increase muscle proprioception and enhance performance. However, whether strength training on an unstable condition compared to traditional strength training, is more effective in enhancing the physical fitness components of adolescent soccer players remains largely unclear. The aim of this study was to compare the effects of strength training performed on stable vs. unstable condition on physical fitness in male adolescents soccer players. Twenty male adolescents U14 soccer players participated in this study. Participants were randomly assigned on a traditional strength training group (TR, n=9) or a Bosu strength training group (BST, n=11). Both groups followed the same periodized circuit strength training program for 7 weeks including five body weight exercises. The BST performed all exerises on a Bosu ball. Pre and Post tests included countermovement Jump (CMJ) height, standing long jump(SLJ), agility T-test, 30sec push-ups, 30sec sit-ups and repeated sprint ability (RSA). Significant main effects for time were observed for the CMJ height (p=0,002), the SLJ (p<0,001), the T-test (p=0,026) and the push-ups (p<0,001), indicating an improvement from pre-to post- test. No significants difference was found for sit-ups (p=0,175), RSAbest (p=0,315), RSAtotal (p=0,684). No main effects of Group and Time x Group interactions were found. The results of the study suggest that strength training performed with circuit body mass exercises on a Bosu ball may lead to similar increases in physical fitness components compaired to TR training.

Keywords: strength training, agility, unstable surfaces

EVALUATION OF AGREEMENT BETWEEN LPS AND IMU SYSTEMS FOR SPEED METRICS IN BASKETBALL PERFORMANCE ANALYSIS

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Monitoring athlete speed in basketball is essential for assessing performance intensity, tactical behavior, and physical demands. This study evaluates agreement between a Local Positioning System (LPS) and wearable Inertial Measurement Units (IMUs) in measuring two key speed-related metrics: average and maximum speed. The two systems use fundamentally different sensing approaches. LPS provides position-based tracking through radio-frequency localization, from which speed is derived via temporal differentiation of player trajectories. In contrast, IMUs estimate speed indirectly through acceleration data from embedded accelerometers, gyroscopes, and magnetometers, requiring integration and filtering. These methodological differences introduce challenges in accurately capturing instantaneous and peak speed values. Correlation analysis was performed to assess consistency between the two systems. The results indicate moderate agreement for average speed ($r = 0.8201$), suggesting that both systems can reasonably capture overall movement intensity. However, the correlation for maximum speed is lower ($r = 0.6893$), indicating notable discrepancies in detecting peak performance events. The reduced agreement, particularly for maximum speed, can be attributed to factors including sensor noise, differences in sampling frequency, filtering methods, and the difficulty of capturing short-duration, high-intensity actions. IMU-based speed estimation is especially sensitive to integration errors and drift, while LPS measurements may be affected by positional smoothing and latency, leading to underestimation of rapid speed changes. These findings suggest that while both systems are suitable for monitoring general speed characteristics, caution is required when interpreting peak speed metrics. The results highlight limitations of relying on a single sensing modality for high-intensity performance analysis. In conclusion, although LPS and IMU systems demonstrate acceptable agreement for average speed, their lower consistency in maximum speed estimation underscores the need for improved data fusion techniques and algorithm refinement. Combining both systems may provide a more robust, comprehensive assessment of basketball player speed.

Keywords: Local Positioning System, Inertial Measurement Units, Load Monitoring

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EXAMINING THE ROLE OF OFFENSIVE MODALITIES AND PLAY TYPES IN GAME OUTCOME IN YOUTH BASKETBALL

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Performance analysis in basketball provides valuable insights into the tactical behaviors associated with team success, particularly in youth development contexts. Understanding how different offensive modalities and play types relate to game outcomes may help coaches optimize training design and decision-making. The purpose of this study was to examine the relationships among offensive modalities, play types, and game outcomes in youth basketball. Offensive possessions from 20 games of the Greek Rising Stars U18 Tournament were systematically analyzed using the observational software Lince Plus. Possessions were categorized by offensive modality (transition, early offense, and set offense) and play type (pick-and-roll, post-up, isolation, etc.) for both the winning and losing teams. Descriptive statistics and chi-square (χ^2) tests of independence were used to explore potential associations among offensive modalities, play types, and match outcome (win vs. loss). The results indicated that organized set offense was the most frequently observed offensive modality, regardless of game outcome. No statistically significant differences were identified between winning and losing teams across the offensive modalities, suggesting that effectiveness may be influenced more by execution quality than by the selection of offensive modality. However, variations in specific play types between winning and losing teams were observed, suggesting that play type selection may contribute to performance differences. Further research, including a larger dataset and additional contextual variables, is required to confirm these observations and to better understand the role of offensive decision-making in competitive success.

Keywords: Basketball, performance analysis, youth, offensive tactics, play types

FROM SELECTION TO PERFORMANCE: THE RELATIVE AGE EFFECT IN THE FIBA U17 WORLD CHAMPIONSHIP

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Abstract The relative age effect refers to the advantage that athletes born earlier in the same calendar year have, especially in annual age classification systems. In developmental basketball, findings on how the relative age impacts competitive performance remain inconsistent, and few studies have looked at this phenomenon at the highest international level. This study aimed to explore the effect of relative age in the FIBA U17 World Championship by analyzing (a) how athletes are distributed by birth quarter, (b) their relation to playing time, and (c) their influence on competitive performance. The sample included 574 athletes from 25 national teams who took part in U17 competitions in 2018, 2022, and 2024. The players were divided into four groups based on their birth quarter. Variables examined were playing time per game and the performance efficiency index adjusted to 40 minutes of play. The analysis involved a chi-square test to evaluate the distribution of birth quarters among basketball players and a nonparametric Kruskal-Wallis test to compare the groups. Results indicated a significant deviation from an equal distribution ($p < .001$), with a higher number of athletes born in the first and second quarters and fewer born in the third and fourth quarters, confirming the relative age effect in selection. However, no significant differences were found in either playing time ($p = .719$) or performance per 40 minutes ($p = .110$) among the four groups. In summary, these findings suggest that the relative age advantage mainly influences athlete selection at the top levels of developmental basketball but does not impact competitive performance. This supports the idea that, while the relative age phenomenon influences team composition, overall performance at the elite level may depend on multiple factors beyond relative age advantage.

Keywords: Key Words: Relative Age Effect, basketball, World Cup, efficiency, participation time

MAINTENANCE OF JUMPING ABILITY FOLLOWING PLYOMETRIC TRAINING AND A PERIOD OF DETRAINING IN FEMALE VOLLEYBALL ATHLETES

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Maintaining athletic performance following a period of detraining is a critical issue in training design. Plyometric training is a key method for improving jumping ability. However, during the competitive season or phases of reduced training load, detraining is often unavoidable. Understanding the extent to which training adaptations are retained is essential for effective training planning. The purpose of the present study was to investigate the maintenance of jumping ability following a period of plyometric training and subsequent detraining in female volleyball players. A total of 48 amateur female athletes participated in the study. They followed an 8-week plyometric training program (2–3 sessions per week) alongside their regular volleyball training, followed by a 4-week detraining period during which they continued only volleyball practice. Jumping ability was assessed using the SJ, CMJ, and DJ tests at four different time points. Statistical analysis was performed using repeated measures ANOVA with Bonferroni post-hoc comparisons. Following the plyometric training period, a statistically significant improvement in jumping performance was observed in all tests (SJ: +8.9%, CMJ: +9.6%, DJ: +10.2%, p 0.05). Despite these reductions, performance values remained significantly higher compared to baseline measurements (p 0.30) suggests that training adaptations were not eliminated during the reduced training period. These findings indicate that plyometric training induces strong neuromuscular adaptations, which are largely preserved even after a period of detraining. This may be attributed to the retention of neural activation and muscle stiffness. In conclusion, plyometric training significantly enhances jumping ability, and these adaptations are largely maintained even after four weeks of detraining.

Keywords: athletic performance, volleyball, retention, neural activation.

MONITORING EXTERNAL LOAD AND NEUROMUSCULAR RESPONSES IN FEMALE VOLLEYBALL ATHLETES: A PRE–POST MATCH STUDY

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Participation in five-set volleyball matches imposes substantial acute neuromuscular fatigue on female athletes due to the high frequency of explosive jumping, rapid accelerations and decelerations, and frequent changes of direction, which may contribute to short-term performance deterioration and elevated injury risk. The aim of this study was to examine the relationship between external load and changes in neuromuscular performance in female volleyball players using force plate assessments. Neuromuscular performance was assessed pre- and post-match using a Bertec 3D force plate (1000Hz), focusing on jump height and reactive strength index (RSI). External load metrics, including Accumulated Acceleration Load (AAL) and Jump Load, were collected via Kinexon's local positioning system (LPS) tracking system. Data processing and statistical analyses were conducted using Python 3.11. Paired t-tests were used to assess pre–post differences, while Pearson correlation coefficients examined relationships between percentage changes in performance variables and external load. No statistically significant differences were observed between pre- and post-measurements for jump height ($p = 0.271$) or RSI ($p = 0.767$). Correlation analysis revealed no significant associations between percentage changes in performance variables and external load metrics ($p > 0.05$). Weak relationships were observed, including a small positive correlation between jump height change and AAL ($r \approx 0.24$) and a moderate trend between RSImod and Jump Load ($r \approx 0.29$), but these did not reach statistical significance. A key limitation of this study is that only neuromuscular performance outcomes were monitored, while detailed kinematic data—potentially more directly related to injury risk—were not assessed, which may have limited the ability to fully characterize movement-specific fatigue responses and their implications for injury risk.

Keywords: Jumping Performance, Accumulated Acceleration Load, Jump Load

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MONITORING EXTERNAL LOAD INTENSITY ACROSS THE EUROLEAGUE BASKETBALL SEASON

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The purpose of this study was to examine potential variations in external load across different phases of the competitive season in a EuroLeague basketball team. Considering that a competitive basketball season is characterized by a limited pre-season period, early high-importance matches, and periods of schedule congestion, it could be hypothesized that teams may progressively adjust or increase match intensity throughout the season. A total of 19 home matches were analyzed using an inertial measurement unit team system (Kinexon), based on external load metrics, such as total distance covered and distance covered at high speed. In order to assess potential trends throughout the season, the matches were categorized into three phases: early season (Matches 1–6), mid-season (Matches 7–13), and late season (Matches 14–19). All variables were analyzed using one-way analysis of variance (ANOVA). No statistically significant differences were observed between the three phases regarding total distance covered ($F = 1.213$, $p = 0.325$) or high-speed distance ($F = 0.241$, $p = 0.789$). These findings suggest that external load intensity remain stable throughout the competitive season, despite in the current study the selection of matches consisting solely of home matches. This stability supports previous evidence indicating that match demands are primarily influenced by contextual and situational factors, such as playing style, opponent characteristics, and travel demands, rather than temporal progression. Therefore, external load monitoring should account for match context when evaluating external load demands in elite basketball.

Keywords: Distance covered, Elite Basketball, External Load Monitoring

NEUROMUSCULAR FATIGUE MONITORING IN PROFESSIONAL FOOTBALL PLAYERS, INTRA-WEEK FLUCTUATION AND CORRELATION WITH THE TRAINING LOAD

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Neuromuscular fatigue (NMF) is a reduction in the maximal voluntary force induced by exercise, with neuromuscular function changes that are due to repeated or sustained muscular contraction. This can last up to four days after a demanding competition but different individuals show relevant differences in recovery profiles because the recovery time after a stimulus can have an individual component. Vertical jumps tests are used widely to assess NMF, apart from the jump height, the reactive strength index (RSI) is a valid tool to assess NMF. The 10/5 repeated jumps test is an alternative to CMJ to assess RSI in athletes, and the execution of only one trial is sufficient. The purpose of this study was to evaluate the fluctuation of NMF during the training microcycle and reveal the correlations with the training load. The participants were members of a high level football team. The 10/5 RSI used to evaluate NMF. Objective, subjective training load and wellnes evaluated by GPS trackers and questionnaires. The players had an familarization period for the 10/5 RSI, after this period the base values were assessed. Then they repeated the test during the training week. Throuought this period as part of their daily routine, the staff were collecting the training load and wellness data. The ANOVA analysis revealed that RSI decreased in the middle of the week, immediately after the training load of the most demanding training day. There was negative correlation with the RPE and the perceived sleep quality and fatigue. Furthermore, there was negative correlation with external load parameters such: Dis 19-25, Acc3, Dec3 and Acc2-3. According to the results, the RSI fluctuated during the training week and there were correlations between subjective training load and wellness, as well as with external load parameters. This is consistent with previous studies that suggest the RSI as a potential tool to monitor neuromuscular fatigue. This is the first study to reveal correlations between training load (objective and subjective) and wellness parameters.

Keywords: Performance monitoring, Evaluation, Training readiness, Reactive Strength Index

POSITION-SPECIFIC EXTERNAL LOAD DEMANDS IN FEMALE VOLLEYBALL PLAYERS

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Volleyball is a complex, intermittent, multidirectional, and non-contact sport characterized by substantial physical demands. Players engage in high-intensity movements across multiple planes of motion. Metrics such as jumping frequency, acceleration profiles, and deceleration rates are critical for assessing and monitoring athletes' workloads and performance dynamics. These indicators offer essential data for optimizing training regimens and injury prevention strategies. A key determinant of each player's workload is their designated position on the team, as different positions require distinct movement patterns and physical demands. This study aimed to delineate the specific physical requirements of each volleyball position. Fourteen female volleyball athletes (mean age: 21 ± 1.3 years; mean height: 1.7 ± 0.07 m; mean body mass: 61.6 ± 2.4 kg) participated in competitive scenarios involving three and five-set friendly matches, adhering to the official regulations set forth by the FIVB. The players were categorized into the following positions: Setter, Middle Blocker, Opposite, Libero, and Outside Hitter. The external load was recorded using a Local Position System (LPS), which analyzed the following variables: Accumulated Acceleration Load, Jump Load, and Mechanical Load. Data analysis was conducted using a One-Way ANOVA. The results revealed statistically significant differences across playing positions for all variables examined ($p < 0.05$). Middle Blockers displayed lower workload metrics relative to other player positions, whereas Outside Hitters, Opposites, and Setters exhibited the most elevated values. The Libero position yielded intermediate results across several performance variables. These findings underscore the necessity of accounting for positional differences when evaluating athletes' workloads. Such an approach enables coaches to achieve a more precise assessment of the team's overall training load and to customize training regimens that align with the specific physiological demands of each player.

Keywords: Volleyball, External Load, Playing Position, Female Athletes, Match Demands

POSITIONAL DIFFERENCES IN EXTERNAL LOAD BETWEEN GUARDS AND FORWARDS IN BASKETBALL: ANALYSIS OF ACCUMULATED ACCELERATION LOAD AND DISTANCE PER MINUTE

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Although it is well documented that female basketball players present a different injury profile and pattern than males, data on external load in women's basketball remain limited. In particular, there is a lack of studies that systematically quantify mechanical load across the different movement axes during female basketball competition, especially by playing position. The aim of this study was to investigate differences in external load between guards and bigs in female basketball, using accumulated acceleration load per minute (AAL/min) and distance per minute as key indicators. Players were classified into two positional groups, guards and forwards. External load was recorded using player tracking technology during competitive activities, and AAL/min and distance per minute were calculated. AAL reflects the overall mechanical load associated with accelerations and decelerations across the three movement axes, whereas distance per minute primarily captures horizontal displacement. Independent-samples t-tests were used to compare the two positions for each indicator. No statistically significant difference was observed between positions for AAL/min. Guards demonstrated values of 12.98 ± 2.05 AU, while bigs recorded 12.71 ± 2.16 AU. In contrast, a statistically significant positional difference emerged for distance per minute. Guards covered a greater distance per minute (73.15 ± 10.05 m/min) compared with bigs (68.45 ± 7.03 m/min). These findings indicate that although the overall mechanical load per minute, as quantified by AAL/min across all three movement axes, does not differ substantially between guards and bigs, guards cover significantly greater horizontal distance per unit of time. This likely reflects their more mobile and spatially extensive role on the court, with increased demands for off-ball movement, space coverage, and frequent positional changes in modern basketball. The results may inform position-specific training design and the individualization of conditioning programs to prevent musculoskeletal injuries.

Keywords: Training Load, Muscle Injuries, Performance

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PRE- TO POST-MATCH CHANGES IN HEART RATE VARIABILITY IN FEMALE VOLLEYBALL PLAYERS

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Volleyball is a high-intensity indoor sport that places great physical demands alongside high-level volleyball skills. In volleyball, there is a strong need for internal load monitoring due to the players' high external exposure. Heart Rate Variability can provide information about the athlete's nervous system, while at the same time it is a useful tool to detect the recovery and the readiness of the athletes prior to a competition. The aim of this study was to investigate the changes that occur in Heart Rate Variability before and after a volleyball game. Fourteen female volleyball players (age: 21.0 ± 1.3 years, height: 1.7 ± 0.07 m, body mass: 61.6 ± 2.4 kg) participated in one friendly volleyball game, which included three sets. Heart Rate Variability was monitored in an empty, quiet stadium while the players remained in a supine position for 5 minutes following a three-minute relaxation period. The assessment was performed before and after the match via Polar Team Pro, and the analyzed variables include minimum (min) RR Interval (RR = the time between two successive heartbeats), maximum (max) RR Interval, average RR Interval, and the root mean square of successive differences (RMSSD). Data analysis was performed using a paired-samples T-Test, with a significance level of $p \leq 0.05$. The statistical analyses showed significant changes in most of the examined variables ($p < 0.005$). There was a decrease in min and average RR Interval after the game, in contrast to the fact that there was no significant statistical difference in max RR Interval. The findings of this study suggest that three volleyball sets may lead to a significant decrease in min, average RR Interval, and RMSSD, indicating high heart rate and low activity of the parasympathetic system in female athletes. From a practical point of view, a longer recovery time for the female players following the game may lead to a better activation of the parasympathetic system and therefore to a better monitoring of fatigue.

Keywords: Volleyball, Heart Rate, RMSSD, Athletes

PROFILE OF CATCHBALL ATHLETES: DEMOGRAPHIC AND SOCIAL CHARACTERISTICS OF PARTICIPANTS FROM NORTHERN GREECE.

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Papalia Aggeliki, Amprasi Evaggelia Democritus University oh Thrace, D.P.E.S.S. Catchball is a new dynamic and rapidly emerging team sport that incorporates elements of volleyball and handball. It combines fun, enjoyment, cooperation and physical activity, offering a pleasant and socially engaging way for women to remain active. Although it is less well –known than other sports, it is steadily gaining popularity, especially among women seeking a fun and social way to stay active. The aim of this study was to outline the profile of athletes who participate in catchballfrom Northern Greece, focusing on demographic, and social characteristics, as well as information regarding the duration of involvement and weekly training frequency. A total of 104 catchball athletes from northern Greece participated in the research, aged 23-58 years, completing a questionnaire that examined demographic and social characteristics, along with their duration of involvement in catchball. From the questionnaire it emerged that most athletes were between 40-50 years old, among of them, 70 were married, 89 had at least one child and 5 reported having grandchildren, highlighting the presence of women with multigenerational family roles. The majority had been involved in catchball for approximately three years, and most reported training three times per week. The results showed that catchballattracts primarily middle –aged women with established family responsibilities, who nevertheless maintain a consistent level of physical activity and long –term engagement with the sport. These findings emphasize that catchball is a highly accessible and inclusive form of physical activity for women with multiple roles and responsibilities, offering opportunities for social interaction, physical exercise and empowerment.

Keywords: catchball, women, team sport, demographic characteristics

PROFILE OF CATCHBALL ATHLETES: EDUCATIONAL AND EMPLOYMENT BACKGROUND OF PARTICIPANTS FROM NORTHERN GREECE.

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Catchball is a rapidly expanding team sport that attracts an increasing number of adult and middle aged women, offering a fun and enjoyable way for women to remain physically active. This study aimed to investigate the educational and employment background, as well as the duration of involvement and the frequency of weekly training, of women participating in catchball. A total of 104 Catchball athletes from northern Greece completed a questionnaire assessing their educational background, employment status, years of participation in catchballand weekly training frequency. The results indicated that the majority of athletes had completed university –level education, reflecting a highly educated participant profile. Regarding employment status, 37 athletes were civil servants, while 30 were employed in the private sector, indicating a broad distribution across professions. The majority had been involved in catchball for approximately three years, and most reported training three times per week. These findings highlight that catchball attracts women from varied educational and professional backgrounds who maintain a consistent commitment to physical activity. Catchball appears to offer an accessible, motivating and socially supportive environment that encourages long –term participation among adult women.

Keywords: Catchball, women, team sport, education, employment status

RELATION OF TIME AND QUALITY OF PASSES TO COUNTER-ATTACKING IN HIGH-LEVEL MEN'S TEAMS IN GREEK A1 CHAMPIONSHIP 2025–2026

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The aim of the present study was to compare technical-tactical elements (pass and counterattack) of teams that participated in the A1 men's championship for the 2025–2026 season (A round). The sample consisted of six (6) matches played between teams that finished in the top four positions. The data evaluated included the quality and timing of passes in relation to the counter-attack. These technical details were recorded through observation and documentation of each event (578 matches-related incidents) using a structured protocol with an individual scale (5-point scale) for each variable. The statistical analysis performed was the chi-square test (χ^2) using the SPSS program. After processing the data, it was found that there is a significant relation between time and quality of pass in relation to the counter-attack (type, direction, quality). In conclusion, the results show a strong correlation between pass skills and counter-attacking, particularly the time and quality of passes in relation to the type, direction and quality of the counter-attack. These findings could be used as technical details to improve the competitive characteristics of players as well as for coaches to develop parts of team training programs. Additionally, the results could be used as effective indicators of counter-attacking due to the high correlation between the aforementioned sequential skills in competitive phases.

Keywords: time, quality, pass, counter-attack

RELATIONSHIP AMONG EXTERNAL LOAD VARIABLES IN HANDBALL: IMPLICATIONS FOR LONGITUDINAL MONITORING

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Handball is defined by its intermittent, high-intensity demands, which impose substantial external load requirements on players. In contrast to sports like soccer and basketball, the body of research examining the interrelationships among external load parameters in handball remains relatively sparse, particularly regarding their efficacy in tracking athlete performance. This study aimed to investigate correlations among specific external load metrics collected during competitive handball matches to identify optimal indicators for long-term performance monitoring and improvement. A total of eighteen male handball players (mean age: 19.06 ± 2.11 years) were enrolled in the study. External load parameters were quantified during an official match utilizing the KINEXON Local Positioning System (LPS). The analysis concentrated on critical performance indicators, including total playing time, overall distance traveled, distance covered per minute, and Accumulated Acceleration Load (AAL). Correlation analysis indicated robust associations between playing time and total distance covered (r = 0.826) and between playing time and AAL (r = 0.884), demonstrating that external load metrics are significantly influenced by match participation. Additionally, a particularly strong correlation was observed between total distance and AAL (r = 0.965), reinforcing the notion that both metrics reflect the overall external load volume experienced by the players. Among the relative indicators, distance covered per minute showed a strong correlation with AAL/min (r = 0.880). These findings suggest that absolute metrics such as total distance and AAL effectively quantify overall match load, whereas time-normalized variables are better suited for longitudinal assessments. The combination of distance covered per minute and AAL/min is the most valuable indicator for monitoring external load in handball players, as it accurately captures match intensity despite varying playing times.

Keywords: Handball, External Load, Longitudinal Monitoring

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (DLiS- ΥΠ3ΤΑ– 0559995). In the abstract, all the DLiS consortium members participated.

RELATIONSHIP BETWEEN BLOCKING (TYPE AND QUALITY) AND DEFENSE (ZONE AND TYPE) IN ELITE WOMEN'S TEAMS: 2025 VOLLEYBALL WORLD CHAMPIONSHIP

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This study aimed to compare the technical and tactical aspects of blocking and defense among teams competing in the 2025 Women's World Championship. The sample comprised four matches involving the teams that secured the top four positions. The variables examined included block type and block quality, along with their relationships to defensive zones, types of defense, and defensive quality, all as components of Sequence II. Data collection involved systematic observation and the documentation of each event, comprising 462 game episodes, through a structured observational protocol that utilized a distinct five-point rating scale for each variable. The statistical analysis was performed using the chi-square test in SPSS. The findings revealed no significant association between block type and defense type. However, block type did show a significant association with both defensive zone and defensive quality. Block quality was significantly linked to factors such as defensive zone, type of defense, and overall defensive quality. The findings underscore the close relationship between blocking and defense, particularly regarding the type and quality of the block, as well as the zone and quality of subsequent defensive actions. These insights may offer valuable guidance for coaches in designing practice drills and creating training scenarios that better replicate the sequential interaction of these skills during match play. The ultimate goal is to enhance the effectiveness of the final actions in rallies, especially in counterattack situations.

Keywords: Comparison, Performance Analysis, Evaluation, Technical Skills, Complex II

RELATIONSHIP BETWEEN EXTERNAL LOAD AND JUMPING PERFORMANCE CHANGES IN FUTSAL PLAYERS: A PRE–POST ANALYSIS

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Acute fatigue induced by match play is considered a potential risk factor for injury in team sports, as elevated external loads can compromise neuromuscular function and movement control. In futsal, the high-intensity, intermittent nature of the game leads to substantial mechanical and metabolic stress, yet the extent to which external load during a single match is reflected in acute changes in jumping performance remains unclear. The purpose of this study was to investigate the relationship between external load and changes in jumping performance in futsal players using force plate assessments after one match. Jumping performance was assessed pre- and post-match using a Bertec 3D force plate (1000 Hz), focusing on jump height and reactive strength index (RSI). External load metrics, including Accumulated Acceleration Load (AAL) and Jump Load, were collected using Kinexon's local positioning system (LPS). All data processing and statistical analyses were conducted using Python 3.11. Paired t-tests examined pre–post differences, and Pearson correlation coefficients explored relationships between percentage changes in performance variables and external load measures. No significant differences were observed between pre- and post-measurements for jump height ($p = 0.911$) or RSI ($p = 0.912$), with trivial effect sizes (Cohen's d 0.05). Weak-to-moderate associations were observed, including a small negative relationship between AAL and jump height change ($r \approx -0.15$) and a moderate trend between jump height change and Jump Load ($r \approx 0.34$), though these did not reach statistical significance. These findings suggest that external load measures may not directly reflect acute jumping performance changes in futsal players. However, in this study, only jumping performance was evaluated, and it was not possible to evaluate changes in kinematic characteristics that may be relevant to injury risk.

Keywords: Team sports, Neuromuscular Performance, Accumulated Acceleration Load

The project is co-funded by the European Union – NextGenerationEU through the Recovery and Resilience Facility (RRF) for the period 2022–2025, with the contribution of the National Public Investment Programme (PIP) and national resources covering VAT (DLiS- ΥΠ3ΤΑ– 0559995). In the abstract, all the DLiS consortium members participated.

SEASONAL CHANGES IN TRAINING LOAD IN VETERAN MALE BASKETBALL PLAYERS

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Veteran basketball may represent an important and engaging form of organized physical activity for middle-aged adults; however, limited evidence is available regarding the competitive demands experienced by this population during long-term organized participation. The aim of the present study was to quantify match load in veteran male basketball players across a championship season and to examine whether participation in official competition may provide a meaningful physical stimulus. Nineteen veteran male basketball players (45.16 ± 6.02 years), representing different teams competing in a veteran basketball championship, were monitored using the KINEXON Local Positioning System (LPS; KINEXON, Munich, Germany). Data were collected during 12 official matches, with 4 matches analyzed at the beginning, 4 in the middle, and 4 at the end of the regular season. The examined variables were distance covered per minute, physio load, accumulated acceleration load per minute, maximum speed, jumps, and exertions per minute. Differences across the three phases of the season were assessed using one-way ANOVA. Significant differences were observed for physio load, accumulated acceleration load per minute, and jumps. Specifically, physio load increased from 514.97 at the start of the season to 589.04 at mid-season and 750.22 at the end. Accumulated acceleration load per minute increased from 9.31 at the start to 12.02 at mid-season and remaining elevated at 11.01 at the end. Similarly, jumps increased progressively from 18.58 to 22.84 and 30.84 across the three phases. In contrast, no significant differences were found for distance covered per minute, maximum speed, or exertions per minute. Overall, these findings suggest that participation in veteran basketball is associated with progressively greater physiological and locomotor demands across the season and may provide a meaningful physical stimulus that supports active and health-promoting engagement in middle-aged men.

Keywords: Master Athletes, Physical Activity, Training Load

SEX-BASED DIFFERENCES IN ANTHROPOMETRY AND PERFORMANCE IN HANDBALL PLAYERS: A COMPARATIVE ANALYSIS

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Handball is a high-intensity, dynamic team sport that places significant loads on the lower limbs and joints, particularly the hip and knee, due to frequent jumps, rapid directional changes, and physical contact. Female athletes, influenced by biomechanical and physiological differences, are particularly susceptible to joint instability and injury. The purpose of the research is to examine female handball players in order to compare their anthropometric characteristics, physical performance, and throwing abilities with reference values reported for male handball players. For the purposes of the study, a large sample of female players aged 14–40 years, including amateur and elite levels, was tested and analysed. The participants were grouped according to their level of performance to allow more precise evaluation. To fulfil the objectives of the study, the following research techniques were used: review and analysis of available scientific literature; anthropometric measurements (height, weight, BMI); physical tests (20 m sprint, vertical rebound); and motor tests (throwing velocity from 3 steps and with rebound). Comparative analysis with male players was conducted using published data from studies with similar testing protocols. Statistical analysis of the results was performed using descriptive statistics and comparative methods. All data were analysed using the Microsoft Excel software package. The results revealed very large differences in 20 m sprint (3.8 ± 0.3 s vs 3.1 ± 0.2 s) and vertical rebound (35.4 ± 5.7 cm vs 47.5 ± 6.0 cm), as well as large differences in throwing performance (64.1 ± 9.7 km/h and 65.3 ± 9.6 km/h vs ~80–82 km/h), while the difference in BMI (23.4 ± 3.5 vs 24.5 ± 2.0 kg/m²) was small. These findings indicate that the differences are mainly related to speed, explosive power, and sport-specific performance rather than body composition. In conclusion, female handball players demonstrate lower performance levels compared to male reference data, particularly in motor and throwing abilities.

Keywords: HANDBALL, FEMALE ATHLETES, ANTHROPOMETRY, MOTOR PERFORMANCE, THROWING VELOCITY, SEX DIFFERENCES

THE EFFECT OF BASKETBALL DRILL CONSTRAINTS ON EXTERNAL LOAD DEMANDS

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The aim of this study was to compare external load demands between the standard training scrimmage drill and a modified rule condition drill with a reduced shot-clock (14 s) in basketball players. During practice, specific drills may replicate match conditions or even impose greater demands. Previous research has demonstrated that external load demands in basketball drills are highly dependent on task constraints, such as player number, court dimensions, and rule modifications, which can substantially alter the intensity. Fourteen semi-professional players were monitored over a four-week in-season period. External load variables, including distance per minute (distance/min) and accumulated acceleration load per minute (AAL/min), were calculated using an inertial measurement unit system. For each player, mean values from scrimmage and modified rule conditions were compared using paired-samples t-tests. Significant differences were observed between conditions, with the modified rule drill resulting in higher external load compared to scrimmage for both distance/min (115.71 vs 96.86, $t = -7.92$, $p < 0.001$) and AAL/min (16.61 vs 14.60, $t = -5.95$, $p < 0.001$). These findings indicate that reducing shot-clock duration substantially increases the physical demands of training, likely due to increased game pace, more frequent transitions, and reduced recovery opportunities between actions. These results highlight the importance of training design in basketball, demonstrating that manipulation of drill constraints can be used to systematically increase external load. Such drills may be utilized to exceed match demands or simulate high-intensity in-game scenarios, thereby improving players' readiness for competition. Future research should investigate the chronic effects of these training strategies on match performance and physical development in basketball players.

Keywords: Keywords: Modified Drills, Training Desing, Basketball

THE EFFECT OF CHANGING COACHES DURING THE SEASON ON THE COMPETITIVE PERFORMANCE OF BASKETBALL TEAMS: MYTH OR REALITY

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Coaches' substitutions during the season are a common intervention in the technical management of basketball teams, aimed at improving competitive performance. The purpose of this study was to investigate whether changing coaches during the season is associated with improved competitive effectiveness of basketball teams. The games of six top European National leagues during the 2024–2025 season were studied. The coaching changes were obtained from the official websites of the leagues and teams, or from internationally recognized basketball websites. In total, 24 coaching changes were observed across 95 teams. To compare the win percentage (Win%) before and after the coaching change, a paired t-test was used, with a significance level of $p < 0.05$. The results showed an average improvement in Win% of 3.8% after the coaching change across the entire sample; however, this difference was not statistically significant, thus failing to confirm the effect of the coaching change on team performance. 52.7% of teams showed improved performance after a coach change, with December and January as the "hot" months for changes. Management should consider the overall competitive and organizational context before making a coaching change. Future research could examine the short- and long-term effects, as well as the factors that enhance or limit the outcomes of a coaching change.

Keywords: coaching effect, coaches' changes, basketball, performance

THE EFFECT OF COMBINED TRAINING PROTOCOLS ON THE CHANGE IN JUMPING ABILITY OF ADULT FEMALE VOLLEYBALL ATHLETES

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Jumping ability is a key determinant of performance in volleyball. Effective management of training load and the selection of appropriate training stimuli are critical for both improving and maintaining performance, especially during long competitive seasons. Although resistance training and plyometric training have been extensively studied, limited data exists regarding the combined application of different strength training modalities and the longitudinal development of jumping ability. The purpose of this study was to investigate the effects of three different combined strength training protocols on the jumping ability of adult female volleyball athletes, as well as to examine the maintenance of adaptations during a subsequent plyometric training phase and a period of detraining. A total of 64 female volleyball athletes (aged 18–32 years) participated in the study and were randomly assigned to three experimental groups and one control group. The experimental groups followed, for eight weeks, one of the following protocols: (a) resistance training combined with plyometric exercises, (b) suspension training combined with plyometric exercises, and (c) a combined program including resistance training, suspension training, and plyometric exercises. This was followed by an eight-week period of plyometric training and a final four-week period of volleyball-specific training. Measurements were conducted at four time points and included squat jump (SJ), countermovement jump (CMJ), free-arm countermovement jump (FCMJ), drop jump (DJ), block jump (BJ), and approach jump (AJ). Following the combined training period, a statistically significant improvement was observed in all jump tests (8.5–10%, $p<0.001$) in the experimental groups, with the largest effect sizes found in the groups that included resistance training. The plyometric phase did not lead to further performance increases; however, it maintained the adaptations at a high level. During the detraining period, a small decrease (0.5–1%) was observed, without loss of the overall improvement. No significant changes were found in the control group. These findings suggest that combined strength training protocols constitute an effective strategy for improving the jumping ability of adult female volleyball athletes. Plyometric training appears to function primarily as a mechanism for maintaining performance, while short-term detraining with sport-specific characteristics does not negate the positive adaptations.

Keywords: neuromuscular adaptation, training load, explosive strength, match performance, detraining

THE EFFECT OF PRACTICING VISUAL PERCEPTION GAMES IN WHOLE BODY REACTION TIME OF CHILDREN AGED 8-10 YEARS IN VOLLEYBALL

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Volleyball is classified as an open –skilled sport, in which the environment, equipment, and players' positions constantly change. The characteristics of the environment determine when the movement should start and the goal is to adapt moment to the changing environment. This is why athletes need to have developed Whole Body Reaction Time (WBRT), the ability of an individual to respond quickly and accurately with whole body to the appearance of a visual stimulus. The purpose of this study was to examine the effect of practicing visual perception games in whole body reaction time of children in volleyball. Thirty –two (n=32) female volleyball players aged 8 -10 years took part in the study and were randomly divided into two equal groups: the Experimental Group (EG), which followed a visual perception training program, and the Control Group (CG), which followed a typical volleyball training program. The intervention lasted 6 weeks, with a frequency of two sessions per week and a duration of 24 minutes per session. Whole body reaction time was assessed using the "Whole Body Reaction Timer" (Takei Instruments). Measurements were conducted before the start of the intervention, at the end and one week after the intervention without any additional training. The two –way repeated measures ANOVA revealed significant differences between the groups from pre –test to post –test and from pre –test to retention –test, with the EG demonstrating statistically significantly higher mean scores compared to the CG. In conclusion, participants in the EG improved their WBRT and maintained this improvement. Therefore, the specific exercises used in the EG, can be recommended to coaches as an effective method for developing and improving whole body reaction time.

Keywords: volleyball, children, whole body reaction time

THE GEOGRAPHY OF HOME COURT: INVESTIGATING HOME ADVANTAGE BY COUNTRY IN THE EUROLEAGUE

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Home advantage (HA) remains one of the most persistent phenomena in professional sports, significantly influencing game outcomes. The purpose of this study was to quantify the size of home advantage (HA%) for EuroLeague teams by country of origin for the period 2016–2025. A total of 1,740 regular-season games were analyzed, with data sourced from the official EuroLeague website. The HA% index was calculated for each country to map and compare home advantage across participating countries. The nonparametric Kruskal-Wallis test was used to evaluate differences between countries, with $p < 0.05$ as the level of statistical significance. The results showed no statistically significant difference between countries ($H = 1.301$, $p = 0.315$). However, there were notable variations in HA% values, with Turkey having the highest percentage (70.61%) and France the lowest (58.13%). The existence of home-court advantage, even at the highest level of basketball, such as the EuroLeague, underscores the need for thorough preparation for away games. Coaches should develop training content and tactics for their teams that simulate high-pressure environments, such as those encountered in away games, to build psychological resilience and adaptability.

Keywords: basketball, EuroLeague, home court advantage, countries

THE INFLUENCE OF STRENGTH LEVEL ON SOCCER PHYSICAL FITNESS BETWEEN STRONGER AND WEAKER FEMALE PLAYERS

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ABSTRACT Muscle strength is a determinant of performance in several team and individual sports. In soccer, stronger athletes are faster, produce greater amounts of power, apply their force rapidly (i.e. rate of force development) although no differences have been found in lean mass and fat. However, the data are scarce regarding the influence of muscle strength in female players. The purpose of the present study was to examine the role of lower body muscular strength in athletic performance between female soccer players and to investigate the correlation between physical fitness parameters. A total of 20 first-division female soccer players participated in the study (age: 23.6±5.3 years; height:1.66±0.05m; mass: 61.4±6.7kg). All players were healthy, regularly engaged in training and competition, and free from recent injuries that could affect performance. Data collection was conducted during two nonconsecutive days to minimize fatigue effects. On the first day, anthropometric characteristics, body composition via skinfolds and maximal isometric leg extension (MIF) were assessed using a dynamometer. On the second day, participants performed vertical jumps (CMJ) via OptoJump and then standing horizontal jumps and agility (T-Test) and change-of-direction (505 test) were measured. Participants were subsequently divided into two groups stronger vs. weaker according to the median value of MIF per mass. The analysis included the correlation coefficient Pearson r, the T-Test for independent samples and the level of significance was set at $p \leq 0.05$. Correlation analysis showed that MIF was significantly correlated with CMJ power/mass ($r=0.631$, $p=0.003$), while fat free mass correlated with CMJ power ($r=0.885$, $p=0.001$). Stronger players were older ($p=0.038$), shorter ($p=0.048$), jumped higher in CMJ ($p=0.048$), tended to have a greater long jump ($p=0.080$), had a lower time in 505 from both sides ($p<0.05$) but no difference was found for T-Test ($p=0.212$) The results indicated that stronger female players demonstrated significantly superior performance almost across all tested variables compared to weaker players.. These results suggest that lower body muscular strength appears to be a key determinant of athletic performance in female soccer players.

Keywords: Keywords: muscle power, strength, change of direction, soccer

THE RELATIONSHIP BETWEEN SET-PLAY EFFECTIVENESS AND MATCH PHASE IN THE EUROPEAN MEN'S FOOTBALL CHAMPIONSHIP

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In recent years, the systematic study of football has demonstrated the critical importance of set plays, regardless of the level, gender, or tournament context, both for goal scoring and overall match outcomes. The aim of this research was to record set pieces and determine whether their effectiveness is independent of the tournament stage (group stage, quarterfinals, semi-finals, and the final). The sample consisted of 728 set pieces from the 2020 European Men's Football Championship, specifically focusing on the top 16 teams based on their tournament progression. Data were collected using SportScout software. The types of set pieces studied included: a) corner kicks, b) penalty kicks, c) indirect free kicks, and d) direct free kicks. Statistical processing involved frequency analysis and Crosstabs analysis using the Chi-Square test. As expected, the majority of set pieces occurred during the group stage. However, their effectiveness remained independent of the tournament phase (Chi-square=9.58, p=.670). These results suggest that a team's performance in set pieces remains stable regardless of the competitive stage. This may indicate that set pieces are a "controlled" aspect of the game, seemingly unaffected by the shifts in psychology or fatigue that occur throughout high-level competitions.

Keywords: Performance Analysis, Video Analysis, Technical-Tactical Behavior

THE ROLE OF THE HAMSTRINGS IN SPEED AND AGILITY IN FEMALE BASKETBALL PLAYERS

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Basketball is a sport that consists of repeated explosive movements such as short-distance sprints and rapid and continuous changes of direction. Lower body muscle strength and body composition have a decisive role in fitness performance of female basketball players. However, data are scarce regarding the link between body composition, lower body explosive strength and fitness performance in female basketball players. The aim of the study was to investigate the correlation between body composition isokinetic knee extension and flexion dynamometry with sprinting and agility in female basketball players. The study involved 11 young female basketball players (age: 19.3±1.1 years, mass: 70.3±12.4kg, height: 1.73±0.06 m). The players were assessed on two different days in body composition, isokinetic knee extension and flexion dynamometry at 180 degrees, linear 0-20m sprint and agility with the T-Test. The Pearson r-correlation coefficient was used for statistical analysis. The results showed significant correlation between total fat with 0-20m linear sprint (r:0.632, p: 0.037) and with T-Test (r: 0.606, p: 0.048). A significant correlation was found between quadriceps extension torque per mass with the 0-20m sprint (right leg r: -0.602 p: 0.050, left leg r: -0.661 p: 0.027) and significant correlations with hamstring flexion torque per mass (right leg r: -0.705 p: 0.015, left leg r:0.669 p: 0.024). Finally, a notable correlation was found between the torque per mass in the hamstring flexion of both legs and the T-Test (right leg r: -0.688, p:0.019, left leg r: -0.650, p: 0.030). The above results suggest that hamstrings torque has a significant role in sprinting and agility in female basketball players. Caution should be given to excess increases in fat mass since it might be a limiting factor for performance. From a practical perspective, the addition of eccentric exercise might enhance hamstring strength and as a consequence improve performance in several basic skills on the basketball court.

Keywords: torque, speed-strength, peak torque, sprint.

TRAINING LOAD DISTRIBUTION ACROSS THE WEEKLY MICROCYCLE IN SEMIPROFESSIONAL FEMALE BASKETBALL

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Planning and distributing training loads throughout the weekly microcycle are essential for preparing basketball players for competition. While it is common to organize training load around game day, there is limited data on how training load is distributed specifically among semi-professional female athletes. The purpose of the study was to systematically monitor 10 female players (1.73 ± 6.4 cm, 69.4 ± 12.4 kg, 20.5 ± 1.17 yrs) from a Greek basketball team over the first 4 weeks of the in-season period and examine how internal load indicators (session rate of perceived exertion, sRPE) varied throughout the week. The weekly schedule typically included five training sessions, one game, and one day off, with sessions categorized based on their proximity to match day. Internal heart rate and perceived exertion were measured using the Polar Team Pro system, enabling real-time monitoring of all metrics. The results showed a microcycle structure with progressive load accumulation early in the week, consistently high mid-week loads, and systematic tapering before match day. Internal load (sRPE) peaked on match day (708.5 ± 289.7 AU), with lower loads observed on match day -3 (381.5 ± 145.6 AU), match day -2 (292.5 ± 94.0 AU), and match day -1 (293.5 ± 141.4 AU), followed by a sharp decrease post-match + 1 (411.10 ± 178.73 AU). These findings suggest that internal training load is generally higher earlier in the week and decreases before competition, allowing players to enter the game in a recovered and prepared state.

Keywords: internal training load, basketball, microcycle, periodization

TYPE AND DIRECTION OF PASS – COUNTER ATTACK IN HIGH-LEVEL MEN'S TEAMS IN GREEK CHAMPIONSHIP A 1 2025–2026

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The aim of the present study was to compare technical-tactical elements (pass and counterattack) of teams that participated in the A1 men's championship for the 2025–2026 season (A round). The sample consisted of six (6) matches played between teams that finished in the top four positions. Evaluated were the type and direction of the pass in relation to the type, direction and quality of the counter-attack. These technical details were recorded through observation and documentation of each event (582 match-related incidents) using a structured protocol with an individual scale (5-point scale) for each variable. The statistical analysis performed was the chi-square test (x^2) using the SPSS program. After processing the data, it was found that there is a significant difference in the type and direction of the pass in relation to the type, direction and quality of the counter-attack. In conclusion, the results show a strong correlation between the successive skills observed and recorded in Syndrom II. Coaches could use these findings to emphasize specific training components or game situations related to counter-attacks and their effectiveness, so that players and teams can achieve more effective competitive actions.

Keywords: defense, pass, observation, counter-attack

VARIATION OF EXTERNAL LOAD ACROSS MATCH QUARTERS IN BASKETBALL

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The purpose of this study was to examine variations in external load across basketball match quarters. Understanding how physical demands change within a match may provide valuable information for performance optimization, load management, and match strategy. Eleven players were monitored across five official matches. External load variables, including distance per minute (distance/min) and accumulated acceleration load per minute (AAL/min), were calculated using an inertial measurement unit system. For each player, mean values across matches were computed for each game quarter (Q1–Q4). Differences between quarters were analyzed using repeated measures analysis of variance. Significant differences were observed across quarters for both distance ($F = 5.35$, $p = 0.005$) and AAL ($F = 7.45$, $p = 0.001$). Distance was highest in Q1 (103.46 ± 16.87) and lowest in Q4 (90.35 ± 16.11), with intermediate values in Q2 (97.29 ± 10.86) and Q3 (98.45 ± 15.23). Similarly, AAL values were higher in Q1 (15.22 ± 1.88) compared to Q4 (13.30 ± 1.79), with moderate values observed in Q2 (14.33 ± 1.31) and Q3 (14.73 ± 1.89). Pairwise comparisons revealed that both distance and AAL were significantly lower in Q4 compared to Q1 ($p < 0.05$). Additionally, significant differences were observed between Q1 and Q3 for both variables, while AAL was also significantly higher in Q3 compared to Q4 ($p < 0.05$). These findings indicate a reduction in external load across match quarters, highlighting the importance of considering within-match variations possibly due to fatigue or change of match strategy. Such variations should be considered when designing training strategies and managing player rotations during competition. Future research should further investigate the temporal distribution of external load within matches and examine the influence of contextual factors such as opponent level, score margin, and match dynamics on these responses.

Keywords: Keywords: Basketball, External Load, Distance, Accumulated Acceleration Load, Match Quarters, Performance

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ΠΕΡΙΛΗΨΕΙΣ - ABSTRACTS

ΚΙΝΗΤΙΚΗ ΑΝΑΠΤΥΞΗ-ΜΑΘΗΣΗ-ΑΠΟΔΟΣΗ

MOTOR DELEVOPMENT-LEARNING-PERFORMANCE

CONVERGENT VALIDITY OF THE KÖRPERKOORDINATIONSTEST FÜR KINDER WITH THREE SUBTESTS (KTK3) IN SCHOOL-AGED CHILDREN

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The Körperkoordinationstest für Kinder (KTK; Kiphard & Schilling, 2007) is a widely used tool for the assessment of motor coordination for children and adolescents 5-14 years old. Although original KTK includes four tests (KTK4), many researchers use the three of them (KTK3; Coppens et al., 2021; De Meester et al., 2016), namely walking backwards on a balance beam, jumping sideways, and moving sideways, since the fourth one (one-legged hopping over foam obstacles) is considered time consuming and risky for ankle sprain (Pion et al., 2014). The technical adequacy of the KTK3 is well supported (Novak et al., 2017); however, further investigation for its psychometrics is needed before its use in other populations and countries. Therefore, the aim of this study was to examine the psychometric properties of the KTK3 among Greek children. To this end, the KTK3 was administered to 269 boys and 275 girls aged 8–12 years (M = 9.9 ± 1.1). Factor analysis revealed significant correlations among the three subtests of the KTK3 (r = .43–.59), with factor loadings (λ = .56 –.77), the values of Average Variance Extracted (AVE = .50) and Composite Reliability (CR = .75) supporting its convergent validity. The absence of significant gender differences, combined with the significant age differences identified in the total score of the KTK3, further supports the convergent validity of the KTK3, as they reflect known trends in the development of motor coordination during childhood (Barnett et al., 2016). Results of the study underscore the technical adequacy of this tool for its use in Greek children aged 8-12 years old for the assessment of their motor skills. Further research is needed to check its adequacy for younger and older children in our country and for children with motor impairments, as well as to examine other aspects of its validity and reliability.

Keywords: Motor competence, Psychometric Characteristics, Motor Skills, Balance, Locomotor Skills

KINETIC THEATRE AS AN ALTERNATIVE PHYSICAL EDUCATION APPROACH TO ENHANCING PRESCHOOL CHILDREN'S PLAYFULNESS

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Movement is an inherent trait of preschool children and is closely linked to contemporary pedagogical approaches that utilize the arts as a medium for learning. In modern kindergartens, alternative instructional methods incorporating creative expression, music and bodily engagement play a crucial role in fostering experiential and imaginative development. In this context, kinetic theatre integrates theatrical expression, movement exploration and playful interaction, offering a creative and stimulating environment for active participation and experiential learning. The purpose of the present study was to investigate the effect of a kinetic theatre intervention program on preschool children's playfulness. In particular, it investigated the program's impact on the five dimensions of playfulness: physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy and sense of humour. It also explored whether the program's effects were retained three months post-intervention (follow-up), as well as whether children's responses differed according to gender and geographic area. The sample consisted of 333 preschool children aged 4–5 years from Thessaloniki, Northern Greece. Data were collected before the implementation of the intervention, immediately after its completion and three months later. Two research instruments were used: a) a demographic characteristics questionnaire and b) the Children's Playfulness Scale (CPS) which assesses the dimensions of playfulness. The intervention program lasted six weeks, with the program' s design and implementation being carried out by the researcher within early childhood physical education settings. The findings revealed a positive effect of the kinetic theatre on children's playfulness both immediately after the intervention and three months later. Furthermore, the results indicated that both boys and girls benefited equally from participation in the program, regardless of their geographical background. However, the results highlighted that preschool children from rural areas demonstrated higher levels of manifest joy. Overall, kinetic theatre can serve as an effective pedagogical tool in early childhood education. By integrating movement, play and artistic expression, it provides both physical education teachers and kindergarten educators with a creative instructional approach that supports children's holistic development.

Keywords: Kinetic Theatre,Playfulness,Preschool Age,Physical Education,Intervention Program

RELIABILITY OF THE MOVEMENT ASSESSMENT BATTERY FOR CHILDREN—SECOND EDITION (MABC-2) IN YOUNG ADULTS: A PRELIMINARY STUDY

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Developmental Coordination Disorder (DCD) is a neurodevelopmental disorder, that persists from childhood into adulthood and is characterized by impairments in motor coordination that negatively affect daily life activities highlighting the need for assessment. The Movement Assessment Battery for Children -2 (MABC-2) is a reliable tool used to assess motor skills in children and adolescents, and it is recommended for use with adults, however its reliability remains underexplored. The purpose of the present study was the assessment of MABC-2 reliability, in young adults. 20 young adults (13 males, 7 females; mean age = 24.2 years) participated in the study. Test-retest reliability was assessed using the a two-week interval and intraclass correlation coefficient (ICC) was estimated. Regarding the total score of MABC-2, ICC was 0.75 (moderate reliability) while the internal consistency coefficient Cronbach's α was good showing strong internal consistency (0.87). In addition, total scores for manual dexterity (ICC =0.88), aiming and catching (ICC = 0.81) and balance (ICC = 0.76) indicated moderate reliability for all items, while the internal consistency was strong for all items with Cronbach's α values ranging from good to excellent (manual dexterity = 0.93, aiming and catching = 0.89, balance = 0.87). All in all, the results indicated that reliability values ranged from good to excellent. In conclusion, these preliminary findings provide initial evidence that MABC-2 can be a reliable assessment tool in young adults, however, further research is recommended.

Keywords: MABC-2,reliability,DCD,motor difficulties,young adults

THE EFFECT OF A PSYCHOMOTOR EDUCATION PROGRAM ON MOTOR COMPETENCE IN PRESCHOOL CHILDREN

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Psychomotor education uses movement and physical activity as means of promoting children's holistic development. During the preschool years, it is considered a particularly appropriate pedagogical approach, as it addresses both developmental characteristics and the individual needs of each child. Within this context, motor competence is recognized as a key component of child development. The purpose of the present study was to compare the motor competence of children who participated in a psychomotor education program with that of their peers who did not participate in a similar program. The study sample consisted of 40 preschool children (Mage = 52.8 months, SD = 9.61), who were allocated to an experimental group (EG, N = 20) and a control group (CG, N = 20). Children in the EG participated in a structured psychomotor education program twice a week, with each session lasting 60 minutes, over a period of six months. Motor competence was assessed using the Test of Gross Motor Development–3 (TGMD-3). Statistical analyses were conducted using JASP (Version 0.96.0), and differences between the two groups were examined with independent samples t-tests. The results revealed that the EG achieved statistically significantly higher scores on the total TGMD-3 compared with the CG. Similarly, statistically significantly higher performance was observed in both locomotor skills and ball skills. In conclusion, participation in the psychomotor education program was associated with higher levels of motor competence in preschool children compared with their peers.

Keywords: fundamental movement skills, early childhood, TGMD-3, psychomotor education

THE IMPACT OF TARGETED TRAINING ON THE DEVELOPMENT OF DEPTH PERCEPTION IN VOLLEYBALL

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Deliberate practice is a highly focused and effortful method of improving skills, requiring sustained effort and focused attention from the athlete. At the same time, the coach provides feedback during training, and there is continuous motivation among the athletes, ensuring that engagement remains high. Therefore, this method is considered particularly effective for developing Depth Perception (DP), the ability of an individual to perceive the distance of upcoming objects, which plays a crucial role in open –skill sports, especially ball sports such as volleyball. The present study aimed to investigate the impact of deliberate practice on the development of depth perception in volleyball. Thirty –two (n=32) female volleyball players aged 8 -10 years participated in the study. They were randomly divided into two individual groups of 16 players each: the Experimental Group (EG), and the Control Group (CG). The EG group participated in 12 deliberate practice sessions during 6 weeks, 24 min per session, to improve DP. The CG followed a typical training program. Before the intervention, after and one –month after the intervention without practice, DP was evaluated using “Electric Depth Perception Tester” (Takei Instruments). Two Way Repeated Measures ANOVA was conducted to demonstrate the impact of educational intervention measurements across DP efficacy, and revealed significant differences between EG and CG from pre –test to post –test and retention –test, demonstrating the EG superior performance compared to the CG. In conclusion, participants in the EG improved their DP and maintained this improvement over the time. These findings suggest that deliberate practice can be recommended to volleyball coached as an effective method for developing DP in young athletes.

Keywords: depth perception, deliberate practice, volleyball, kids

ΝΕΕΣ ΤΕΧΝΟΛΟΓΙΕΣ ΣΤΗ ΦΥΣΙΚΗ ΑΓΩΓΗ & ΤΟΝ ΑΘΛΗΤΙΣΜΟ

NEW TECHNOLOGIES IN PHYSICAL EDUCATION & SPORTS

ASSESSMENT OF MOTOR BEHAVIOR USING THE MOVEMENT ABC-2 THROUGH A VIRTUAL REALITY INTERVENTION PROGRAM IN STUDENTS ATTENDING A SECONDARY SCHOOL INTEGRATION CLASS

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Fully immersive programs constitute a contemporary technological approach that enables users to enter and interact with digital environments through multisensory stimuli and physical activity. Virtual Reality (VR) applications develop three-dimensional simulations of either realistic or imaginary worlds, offering innovative perspectives for supporting motor learning. The present study aimed to investigate the effectiveness of two different intervention approaches for improving the motor skills assessed by the test in children with learning difficulties attending inclusion classes. Specifically, a program based exclusively on fully immersive virtual environments was compared with a combined program integrating VR activities with conventional motor exercises. The study involved twenty-eight children (n = 28), with a mean age of 12.82 ± 0.86 years, who were randomly assigned to two intervention groups. During the initial session, participants were assessed using the Movement ABC-2, while the second session focused on familiarizing them with the activities. This was followed by 16 intervention sessions, each lasting 24 minutes, conducted twice per week at the facilities of the Department of Physical Education and Sport Science. The combined program group participated alternately in VR sessions and conventional motor activities. In both programs, a progressive increase in difficulty was implemented, adjusted to the participants' performance level. Data analysis was conducted using a Two-Way Repeated Measures ANOVA. The results showed a statistically significant main effect of measurement ($F(2,52) = 28.722$, p 0.05), nor was there a significant main effect of group ($F(1,26) = 0.567$, $p > 0.05$). Overall, the findings suggest that VR programs can enhance, in the long term, the motor skills assessed by the test in children with Specific Learning Difficulties. Furthermore, the lack of differentiation between the interventions indicates that both fully immersive environments and combined approaches are equally effective, supporting the use of VR as a means of motor skill training.

Keywords: full immersion, integration class, motor skills, Movement ABC-2

DIGITAL LEARNING AND PHYSICAL EDUCATION: THE USE OF CANVA IN TEACHING PRACTICE.

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The integration of digital tools in education has significantly transformed teaching practices, with platforms such as Canva gaining increasing importance in the modern educational process. Canva is a web-based graphic design tool that enables educators to create visually engaging and rich instructional materials, such as presentations, posters, infographics, and worksheets. Its ease of use, accessibility, and wide variety of ready-made templates make it particularly popular across all levels of education. From the educators' perspective, Canva serves as an effective tool for instructional design and the development of educational materials. At the same time, its use encourages differentiated instruction and the creation of collaborative learning activities. Of particular interest is the application of Canva in Physical Education, a subject area in which the use of digital tools has traditionally been limited. Canva can be utilized to design visual content related to exercises, sports rules, training programs, and health and wellness topics, thereby enhancing students' understanding and engagement. Furthermore, it provides students with opportunities to develop projects, such as physical activity plans or awareness campaigns, promoting experiential learning and collaboration. This study presents a concise overview of the Canva platform within the context of digital technology integration in education. It also examines selected tools offered by the platform, with a particular emphasis on their pedagogical use by Physical Education teachers, as well as by students. In conclusion, Canva is an innovative educational tool that can be effectively utilized in both general education and Physical Education. Its successful implementation requires appropriate teacher training to ensure its meaningful integration as a supportive tool in the teaching and learning process.

Keywords: Artificial Intelligence, Canva, Physical Education, Education

EFFECTS OF VIRTUAL REALITY TRAINING ON ELITE GOALKEEPERS IN REACTION TIME & RESPONSE INHIBITION

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Virtual reality (VR) has emerged as a promising tool for sport-specific training, yet evidence regarding its effectiveness in elite soccer goalkeepers remains limited. The aim of this study was to investigate the effect of a three-week VR training program on reaction time and response inhibition in elite goalkeepers. Seven elite youth male goalkeepers from a Super League 1 academy, all with no previous VR training experience, participated in a single-group pre–post intervention study. The program consisted of four weekly VR sessions of 20–30 minutes, with progressive increases in task difficulty. Training and assessment were conducted using the Mentis V.R. platform (Vplayer and Vkeeper) and a Meta Quest 3 headset. Reaction time and response inhibition were assessed through goalkeeper-specific VR tasks administered before and after the intervention under identical initial testing conditions. Statistical analysis was performed using paired-samples procedures according to data distribution. The results demonstrated a statistically significant improvement in response inhibition following the intervention, whereas no statistically significant change was observed in reaction time. These findings indicate that short-term VR training may be an effective supplementary method for improving inhibitory control and perceptual-cognitive adaptation in elite goalkeepers, although its effect on reaction time may require longer or more intensive intervention. Despite the practical relevance of the findings, the small sample size, lack of a control group, and short intervention period limit generalizability. Further controlled studies are needed to determine the long-term training value of VR and its transfer to on-field goalkeeper performance.

Keywords: virtual reality, goalkeepers, cognitive skills, decision-making, intrinsic motivation.

EFFECTS OF VIRTUAL REALITY TRAINING ON ELITE GOALKEEPERS IN VISUAL SEARCH AND DECISION MAKING AND VISUOSPATIAL WORKING MEMORY

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Virtual reality (VR) has emerged as a promising method for sport-specific training, yet evidence regarding its application in elite soccer goalkeepers remains limited. The purpose of this study was to investigate the effects of a three-week VR training program on visual search and decision-making, as well as visuospatial working memory, in elite goalkeepers. Seven elite youth male goalkeepers from a Super League 1 academy, all with no prior VR experience, participated in a single-group pre–post intervention study. The intervention consisted of four weekly sessions lasting 20–30 minutes, with progressive increases in task difficulty. Training and assessment were conducted using the Mentis V.R. platform (Vplayer and Vkeeper) and a Meta Quest 3 headset. Visual search and decision-making were examined through a goalkeeper-specific passing task requiring rapid identification of the unmarked teammate and accurate action selection under time pressure, while visuospatial working memory was assessed through a goalkeeper-specific shooting task with increased perceptual complexity. Statistical analysis was performed using paired-samples procedures according to data distribution. The results showed a statistically significant improvement in visual search and decision-making following the intervention, whereas visuospatial working memory did not show a statistically significant change. These findings suggest that short-term VR training may be an effective supplementary method for enhancing perceptual-cognitive performance related to fast information processing and action selection in elite goalkeepers, although a brief intervention may be insufficient to induce measurable changes in visuospatial working memory. Despite the practical relevance of these findings, the small sample size, absence of a control group, and short intervention period limit generalizability. Further controlled studies are needed to clarify the long-term value of VR training and its transfer to on-field goalkeeper performance.

Keywords: virtual reality, goalkeepers, cognitive skills, decision-making, intrinsic motivation.

FROM THEORY TO PRACTICE: INNORATIVE TEACHING APPLICATIONS IN PHYSICAL EDUCATION WITH DIFFIT

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The rapid development of artificial intelligence in education has led to the emergence of innovative tools that support differentiated instruction, such as Diffit. Diffit is a digital platform based on artificial intelligence technologies, which enables educators to create customized educational material according to students' cognitive level, needs, and interests. The main objective of the tool is to support personalized learning and enhance accessibility to knowledge. Diffit operates by allowing educators to input thematic content or sources, which the platform then automatically transforms into differentiated texts, comprehension questions, vocabulary lists, and activities tailored to different levels of difficulty. This paper presents the use of Diffit in the subject of Physical Education. Although this subject is primarily experiential and movement-based, the tool can support its theoretical dimension, such as understanding sports rules, health concepts, and physical fitness. Furthermore, Physical Education teachers can create differentiated material for students with varying levels of knowledge, thereby enhancing participation and student engagement. In summary, Diffit leverages artificial intelligence to support differentiated instruction and inclusive education. Its effective implementation requires the development of digital skills by educators and its pedagogical integration into teaching practice.

Keywords: Diffit, Physical Education, differentiated instruction, artificial intelligence

FULL IMMERSION PROGRAM ON THE IMPACT OF REJECTING AND RECEIVING CHILDREN WITH SPECIFIC LEARNING DISABILITIES

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Virtual Reality (VR) constitutes a contemporary technological application that enables users to interact with three-dimensional virtual environments through multisensory experiences, opening new pathways in both education and motor skill rehabilitation. The present study examined the effectiveness of two different interventions in improving throwing and catching skills in children with Specific Learning Difficulties. More specifically, the study investigated the impact of a fully immersive VR program compared to a combined program integrating VR activities with traditional motor exercises. The sample consisted of twenty-eight children (n = 28), with a mean age of 12.82 ± 0.86 years, who were randomly assigned to two intervention groups. Motor skills were assessed using the Movement ABC-2 test. The intervention lasted eight weeks and included a total of sixteen sessions, each lasting 24 minutes, conducted twice per week. Participants in the combined program alternated between VR sessions and traditional activities. In both intervention formats, a gradual increase in task difficulty was implemented to support progressive skill development. Statistical analysis of the data was conducted using a Two-Way Repeated Measures ANOVA. The results revealed a statistically significant main effect of measurement ($F(2,52) = 6.432$, p 0.05), nor was there a significant main effect of group ($F(1,26) = 0.399$, $p > 0.05$). In conclusion, the findings suggest that the implementation of VR-based programs can contribute to the long-term improvement of upper limb motor skills in children with Specific Learning Difficulties. The absence of differences between the two interventions indicates that both fully immersive environments and combined approaches can lead to similar outcomes, supporting the use of VR as a tool for motor skill training.

Keywords: Virtual Reality, Specific Learning Disabilities, throwing, catching

INVESTIGATING HOMECOURT APPLICATION VALIDITY AND RELIABILITY IN BASKETBALL SHOT RECORDING

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The analysis of competitive performance is an essential tool for understanding and improving it in modern basketball. In recent years, the use of digital applications for recording game data has increased significantly, enabling coaches and researchers to collect and analyze data in real time. However, the scientific use of these tools requires an investigation of their validity and reliability. The purpose of the present study was to investigate the validity and reliability of the HomeCourt application in recording basketball shots. The evaluation was conducted by comparing three recording methods: (a) video recording via the app, (b) shot location mapping through the app's built-in algorithm, and (c) external observation using an action camera by an independent observer. A total of 420 game recordings from 30 participants were analyzed, with each participant performing 125 shots across the 14 preselected shooting zones of the app. Overall, 3, 750 shot attempts, including both successful and unsuccessful shots per zone, were examined. Data analysis included descriptive statistics, paired t-tests, Pearson correlation coefficients, and intraclass correlation coefficients (ICCs). The results revealed very high correlations between video recordings and external observations for successful shots (r = 0.990), unsuccessful shots (r = 0.994), and total attempts (r = 0.995), while correlations for the shot location mapping were moderate to high. The ICC indicated good reliability across the three recording methods (ICC ≈ 0.79), and most pairwise comparisons showed no statistically significant differences. The findings suggest that the application demonstrates a high level of validity and satisfactory reliability, particularly in the video recording function, and can serve as a valuable tool for performance analysis in basketball in both research and training contexts.

Keywords: Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording Keywords: Home Court App, performance analysis, basketball, digital applications, reliability, validity, shot recording

LONG-TERM, SPACE-THEMED HUMANOID ROBOT INTERVENTION IMPROVES ELEMENTARY STUDENTS' KNOWLEDGE IN HEALTH AND SPACE EXPLORATION

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Embedding thematic elements in Physical Education (PE) can support experiential learning and more focused attention (Pesce et al., 2013). Specifically, space-themed interventions such as NASA's "Train Like an Astronaut" (TLA) have shown to increase interest in PE (Min et al., 2018; Lin et al., 2019). Socially assistive robots have emerged as promising tools for capturing children's attention (Matarić et al., 2007). This work integrates a space-themed activity with a humanoid robot, engaging children in a serious game to support learning of healthy behaviors and space exploration. Participants were 141 students (10-11 years old) who took part in a 6-week intervention, consisting of two 20-minute weekly sessions, and were randomly assigned to a control or an experimental group. All participants performed high-intensity interval training exercises from NASA's "Train Like an Astronaut" (TLA) challenge. In the experimental group, the humanoid robot NAO delivered the primary instructions, supported by the human instructor, whereas in the control group, sessions were led by the human instructor. The exercises included warm-up, squats, crunches, bear crawls and crab walks, with slight weekly variations introduced to sustain interest. At the start of each session, either the humanoid or human instructor delivered information related to physical activity and human space exploration. Participants' knowledge of these concepts was surveyed pre- and post-intervention. At the same time, all students participated in a long-term STEM intervention, called Stories of Tomorrow by Bogner and Sotiriou (2018), which challenged them to organize a sustainable colony on Mars. Knowledge scores improved both in control (Pre, 2.85±0.18; Post, 3.54±0.2; $p<0.003$) and experimental groups (Pre, 3.12±0.20; Post, 4.61±0.23; $p<0.001$). However, the experimental group showed significantly higher numbers of correct responses compared to the control group (Control, 3.54±0.21; Experimental, 4.61±0.23; $p<0.001$). This study confirms the feasibility of integrating a humanoid in PE. The observed knowledge improvement in the experimental group can be attributed to the robot acting as a social agent making the concepts more tangible and relevant to the students. These findings highlight the potential of robot-assisted learning in PE and education more broadly.

Keywords: Human-robot interaction, Physical Education, Social Robots, Educational Robots, Humanoids, Knowledge of Human Health and Space Exploration

REVIEW OF TPACK RESEARCH IN PHYSICAL EDUCATION

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Physical Education (PE) is intertwined with movement and the teaching of motor patterns, as supported by Siedentop (2007). The innovative approach to learning through technology by Mishra & Koehler (2006) created a new scientific dynamic in research and teaching. TPACK is not the effect of technology on teaching according to Talebian et al. (2014), but the way in which a more qualitative approach to teaching practice is achieved. After checking and categorizing research on TPACK in PE (N=47) it was found. The dominant question in the first studies is: how is PE of movement consistent with the use of technology that requires immobility, wonders Niess, among others (2011). Initially, the development of tools to measure the effectiveness of TPACK was investigated, with a leading case being that of Schmidt et al. (2009). Liang, Tsai & Chai (2011) investigated the impact of the individual components of the TPACK theory, while Russell (2012) the barriers and limitations that are posed. A series of studies focused on the impact of training and increasing the ability of PE teachers to integrate technology into teaching, through studies that investigated self-efficacy, the most important of which is that of Semiz & Ince (2012). Some works try to clarify the impact of the school environment and available resources on the application of technology in PE, as reported by Juniu (2011). In another group of studies, the research of Krause & Lynch (2016) aimed to find and evaluate all the qualitative characteristics of the application of the TPACK model in PE teaching. In the COVID-19 pandemic, researchers, such as Killian (2021), shifted their interest to the use of asynchronous platforms and tools and to the evaluation of the related process. A typical example of the asymmetrical relationship between the application of technological knowledge of teachers in Pedagogical Schools and the use of Artificial Intelligence (AI) is the research of Ng (2023), which reinforces the principle of personalization, but also the need for knowledge of algorithms on the part of teachers. The research field in education through the theoretical approach of TPACK is an inexhaustible source of thought.

Keywords: TPACK (Τεχνολογική Παιδαγωγική Γνώση Περιεχομένου),Φυσική Αγωγή,Ενσωμάτωση Τεχνολογίας,Εκπαιδευτική Τεχνολογία,Αυτοαποτελεσματικότητα (Self-efficacy),Τεχνητή Νοημοσύνη (AI) στην Εκπαίδευση

THE IMPACT OF AN AUTONOMOUS FULL IMMERSION VIRTUAL REALITY INTERVENTION ON THE SELF-PRESENCE OF CHILDREN AGED 9-12

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Within the theoretical framework of Dynamic Systems Theory, the aim of the present study was to examine the effects of two different intervention programs designed to practice and enhance perceptual abilities in children aged 9–12 years: one program based on a fully immersive virtual environment and one based on conventional activities, with regard to children's self-presence in relation to the games. The participants were thirty-two (n = 32) children aged 9–12 years, who were randomly assigned to two groups: the fully immersive virtual environment group, which followed a perceptual abilities program based on fully immersive virtual environments using the Oculus Quest 2, and the conventional activities group, which followed a perceptual abilities program based on conventional activities. As a measurement instrument, part of the questionnaire developed by Ho, Lwin, Sng, and Yee (2017) was used, and specifically the "Self-presence" factor of the questionnaire, measured on a five-point Likert-type scale ranging from "very much" (1) to "not at all" (5). For the statistical analysis of the data, an independent-samples t test was conducted. Homogeneity of variance was examined using Levene's test, while normality of the data was assessed using the Shapiro–Wilk test. The analysis of the data revealed no statistically significant differences between participants in the two intervention groups with respect to Self-presence. Lower scores, though not statistically significant, were observed among those who participated in the conventional activities intervention. In conclusion, participants, regardless of intervention group, demonstrated positive self-presence in relation to their engagement with both virtual reality games and conventional activities games.

Keywords: Children aged 9–12 years,self-presence,virtual reality

THE POSITION OF ESPORTS IN CONTEMPORARY SPORT

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The rapid development of esports has raised questions regarding their place within the field of sport and highlights the need for conceptual clarification. The aim of the present study was to examine whether esports meet key criteria commonly attributed to traditional sport and to explore the possibility of their inclusion as a distinct category within it. The study was based on a theoretical approach employing concept analysis and a focused review of the relevant literature, with emphasis on studies examining the definition and characteristics of esports. The analysis focused on dimensions widely used in defining sport, including the organized and competitive nature of the activity, the existence of rules, the requirement of specific skills, institutional organization, and spectator involvement. Based on the synthesis of the literature, esports appear to exhibit structured competitive systems, clearly defined rules embedded in digital environments, and significant demands on cognitive, perceptual, and psychomotor skills. In addition, the presence of organized leagues, international tournaments, and professional pathways indicates the development of an institutional framework. Audience engagement and the role of digital media further highlight the social dimension of esports as a competitive activity. At the same time, certain differences are identified, mainly related to the limited role of physical exertion and the mediation of performance through technological systems. These differences do not appear sufficient to exclude esports from broader interpretations of sport. Overall, the findings suggest that esports meet key criteria commonly used to define sport and may be approached as a distinct category reflecting contemporary forms of organized and competitive activity.

Keywords: Esports, Sport classification, Concept analysis, Competitive gaming, Sport definition, Physical activity

ΟΡΓΑΝΩΣΗ & ΜΑΡΚΕΤΙΝΓΚ ΤΟΥ ΑΘΛΗΤΙΣΜΟΥ & ΤΗΣ ΑΝΑΨΥΧΗΣ

ORGANIZATION & MARKETING OF SPORT TOURISM & RECREATION

AN ASSESSMENT OF SERVICE QUALITY IN GREEN EXERCISE SPACES

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The continuous increase in both the number and use of green exercise spaces highlights the growing importance of systematically assessing service quality in such environments. Green exercise, defined as physical activity conducted in natural settings, has been widely associated with enhanced physical and psychological well-being. However, the quality of services provided in these spaces plays a critical role in shaping user satisfaction, participation frequency, and long-term engagement. The present study aims to assess service quality in green exercise spaces through the collection and analysis of data obtained from a structured questionnaire, developed in collaboration with an organization operating in this field. The research seeks to evaluate users' perceptions of service quality and to identify the key factors that influence satisfaction, commitment, and continued participation in outdoor physical activities. The questionnaire examines multiple dimensions of service quality, including the condition and maintenance of natural environments, safety and accessibility, availability and quality of facilities, and the responsiveness and reliability of those responsible for managing these spaces. Additionally, it explores patterns of participation, such as frequency and duration of exercise, as well as factors related to personal well-being, motivation, and level of involvement in green exercise activities. Furthermore, the study investigates how perceived service quality in green exercise spaces affects users' overall experience and their willingness to maintain an active lifestyle in natural environments. Emphasis is also placed on identifying strengths and weaknesses in current service provision, as well as areas requiring improvement. The findings of this research are expected to provide valuable insights for the effective planning and management of green exercise spaces. By highlighting the importance of high service quality standards, the study contributes to the development of strategies aimed at enhancing user satisfaction, promoting sustainable physical activity, and supporting long-term engagement in green exercise. Ultimately, the results will assist policymakers and practitioners in optimizing the design and delivery of services in outdoor exercise environments, ensuring both user well-being and environmental sustainability.

Keywords: Outdoor exercise spaces,Service quality,User satisfaction,Well-being,Service management,Service evaluation,Physical activity

ASSESSING SELF-COMPASSION IN INDIVIDUALS PARTICIPATING IN YOGA PRACTICES: DIFFERENCES ACROSS DEMOGRAPHIC CHARACTERISTICS AND PARTICIPATION FREQUENCY

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In recent years, there has been a growing interest in alternative forms of physical activity that promote both physical and psychological well-being, with yoga emerging as one of the most widely adopted practices. This research explores the benefits of participation in yoga, with a particular focus on the concept of self-compassion. Yoga, as both a philosophical framework and a practical method, has been shown to offer multiple benefits across various domains of life, including significant psychological advantages (Silveira & Smart, 2020). An increasing number of individuals facing mental and physical health challenges are turning to alternative approaches, such as yoga, to improve their well-being. Self-compassion has emerged as a central construct in contemporary psychological research. It is defined as the ability to treat oneself with kindness, recognize one's experiences as part of the shared human condition, and maintain a non-judgmental attitude toward personal shortcomings and failures. Previous studies have demonstrated that self-compassion is positively associated with life satisfaction, personal growth, happiness, adaptive coping, and even weight loss, while being negatively related to depression, anxiety, thought suppression, and perfectionism. The primary aim of this research is to assess levels of self-compassion among individuals participating in yoga practices and to examine its relationship with participation history and demographic characteristics. A total of approximately 130 adult participants completed an online questionnaire distributed via Google Forms. The instrument included demographic questions and the Self-Compassion Scale, which has been translated and validated in Greek. The study tests the hypothesis that higher levels of engagement in yoga practices are associated with increased levels of self-compassion. Additionally, it investigates whether self-compassion varies across demographic variables. Data were analyzed using the statistical software SPSS, employing correlation analyses as well as group comparison tests (independent samples t-test and one-way ANOVA). The findings of this research aim to support the growing interest in yoga participation by highlighting its psychological benefits and contribution to overall well-being. Furthermore, the results are expected to inform practitioners and participants about the potential development of self-compassion through yoga and to contribute to the existing literature on the mental health benefits of yoga practices.

Keywords: Self-Compassion, Yoga, Psychological Well-being, Participation, Demographic Differences

BUSINESS PLAN DEVELOPMENT: A CASE STUDY OF SALTY SOIL IN THE TOURISM SERVICES SECTOR

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In recent years, the tourism sector has increasingly shifted toward experience-based models that emphasize authenticity, personalization, and active participation, creating new opportunities for diversified tourism enterprises. Within this context, the development of structured and sustainable business plans has become essential for ensuring competitiveness and long-term viability. This study aims to develop a comprehensive and realistic business plan for an enterprise operating in the broader tourism services sector, focusing on the case of Salty Soil, a Greek company engaged in general tourism services while also actively operating in sport tourism, team-building activities, and outdoor experiences. The main objective is to analyze the company's internal and external environment, evaluate its strategic framework, and identify key factors influencing its performance, sustainability, and growth potential within a highly competitive and dynamic market. The research follows a qualitative case study design and is based on primary data collected through structured interviews with three key members of the company, including the owner and employees, all actively involved in tourism and outdoor activity management. The interview protocols focused on business objectives, service portfolio, customer segments, strategic orientation, and sustainability practices. The findings indicate that Salty Soil operates through a diversified service model, offering a combination of tourism services such as guided tours, sport activities, outdoor experiences, and team-building programs, primarily targeting international visitors and corporate groups. This multidimensional approach enhances the company's ability to respond to different market segments while strengthening its competitive position. Its competitive advantage lies in delivering flexible, small-scale, and experience-driven services that promote active engagement and meaningful interaction with local culture and the natural environment. At the same time, the results highlight key challenges, including intense competition, limited financial resources, and pricing pressures. The strategic analysis emphasizes that differentiation, service diversification, staff training, partnerships with local stakeholders, and the enhancement of digital presence are critical for future growth. Furthermore, the company adopts sustainable practices by supporting local economies and promoting environmentally responsible tourism activities. Overall, the study highlights the importance of strategic planning in strengthening the competitiveness and long-term sustainability of diversified tourism enterprises operating in experience-driven markets.

Keywords: business plan, experiential tourism, tourism services, strategic planning, sustainability

CULTURAL DEVELOPMENT'S IMPACT ON LOCAL GOVERNMENT: A CASE STUDY OF THE MUNICIPALITY OF ATHENS.

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The country's cultural life is interwoven with Cultural Heritage (museums, archaeological sites, and monuments) and Contemporary Civilization (music, conservatories, theater, dance, cinema-audiovisual media, and visual arts). In accordance with international and European standards, the City of Athens and its Organization for Culture, Sports, and Youth (OPANDA) are planning their cultural policy based on the development of investment infrastructure and the recruitment of specialised human resources. Operating on behalf of the Municipality are Municipal Radio 9.84, Athens Development Agency, DAEM S.A., Technopolis Athens, the Industrial Gas Museum, INNOVATHENS, ATHENS Culture Net, the "Poio" Workshop, Art in Public Spaces, the Digital Arts Festival, the Summer Film Festival, Premiere Nights, and "Little Paris". Under the direction of the Department of Culture, OPANDA operates 5 theaters (Olympia-Maria Callas, Kalouta Multipurpose Hall, Kolonou Open-Air Theater, Gravas Open-Air Theater, Goudi Open-Air Theater), 4 museums ("Angeliki Hatzimichali," Plato's Academy Digital Museum, "Eleftherios Venizelos," and the Dodecanese House), 4 exhibition spaces (Arts Center, "Melina," "Journey through Old Athens" and "Sotiris Charidimos"), 3 Art Gallery buildings, 3 Library buildings, the Music Ensembles, the Symphony Orchestra, the Philharmonic, the Choir, the Big Band, and the Greek Music Workshop. The purpose of this study is to present and catalog the programs and activities developed at the centers, municipal enterprises, and cultural units of the City of Athens, as a case study. The cultural offerings include annual educational and recreational programs, cultural events, musical-theater performances, concerts, visual arts and photography exhibitions, lectures, guided tours, street art, readings, and talks. For methodological purposes, the information was gathered through interviews with staff members working in different departments of the organizations. The study's findings highlight the multitude of programs and events in various locations, the participation of citizens and visitors in artistic activities, the creation of new partnerships, and the promotion of local communities. It can therefore be concluded that the creation and promotion of cultural products foster citizens' connection to cultural events, develop the secondary economy, and increase human capital's employment. In conclusion, the Municipality of Athens can serve as a model for the strategic redesign of cultural policy by other local government bodies.

Keywords: Cultural Products, Local Government, Cultural Development

DESIGN AND IMPLEMENTATION PROCESS OF SPORTS FOR ALL PROGRAMS: A CASE STUDY OF THE ATHENS MUNICIPAL SPORTS ORGANIZATION

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The process of designing and implementing Sports Programs and Events for All (P.A.g.O – E.A.g.O) is complex due to each stakeholder's differences in terms of size, structure, human resources, logistical infrastructure, and financial status. The aim of the study is to highlight the process between the General Secretariat for Sport (G.S.S.) and the Organization for Culture, Sport, and Youth of the Municipality of Athens (O.P.A.N.D.A). The law required procedure includes O.P.A.N.D.A's accreditation, submission of its application-proposal to the G.S.S., O.P.A.N.D.A.'s decision to carry out the programs, and the submission of the corresponding request to G.S.S. along with the confirmation of budget allocation for the relevant year. This is followed by the issuance of the relevant Common Ministerial Decision (CMD) regarding the positions for physical education graduates (P.F.A.) by G.S.S, along with the relevant approvals for the departments and program categories, while at the same time O.P.A.N.D.A.'s Board of Directors takes a decision on the recruitment of P.E.T. and sends the draft recruitment announcement to the G.S.S. Upon publication of the announcement, interested P.E.T. submit applications, and signs the employment contracts. Submission to the G.S.S. of the reports on the implementation of sections, the completeness of P.E.T. data, and the categories of sections is followed by the issuance of a funding decision to O.P.A.N.D.A, and its submission of program implementation reports and expense reimbursement forms, as well as documentation for the settlement of the funding.The methodological approach was carried out by retrieving administrative documents from various departments of G.S.S. and O.P.A.N.D.A as well as by collecting information from senior executives. The study's findings highlight the increased number and time-consuming nature of the implementation stages, as well as the demanding coordination required among different departments such as Administration, Sports, Finance, Legal, etc., within a specific timeline. In conclusion, the completion of the necessary P.A.g.O. implementation process could be facilitated by potential training of human resources and the upgrading of the organizational framework The description and systematization of P.A.G.O. implementation process presented in this study could serve as a model for other local government agencies.

Keywords: Sports for all programs, local goverment, implementation process

FACTORS INFLUENCING ENROLLMENT IN EARLY CHILDHOOD SWIMMING PROGRAMS: EVIDENCE FROM A SURVEY STUDY

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The purpose of this study was to investigate parental perceptions and the key factors influencing participation in infant swimming programs. A total of 132 parents participated in the study by voluntarily completing an online questionnaire (Microsoft Forms) assessing motivations, perceived benefits, and satisfaction with program characteristics. The survey achieved full geographical coverage of Greece. Descriptive analysis (1 to 5 Likert scale; strongly disagree to strongly agree) revealed highly positive parental perceptions across all domains. Developmental benefits were among the most highly valued factors, with parents strongly endorsing improvements in motor development (mean average score: M = 4.66), perceptual abilities (M = 4.47), and overall physical development. Familiarization with the aquatic environment received the highest rating (M = 4.84), highlighting its central importance. Psychosocial aspects were also rated highly, including enjoyment (M = 4.79), emotional development (M = 4.59), and parent-infant bonding, which 66.4% of participants rated as “extremely important.” Socialization was considered important by the majority of respondents (58.0%), although with slightly greater variability. Health- and safety-related perceptions were also evident, with parents acknowledging contributions to immune function (M = 4.40) and sleep quality (M = 4.14), while perceived acquisition of basic water survival skills received comparatively lower, yet still positive, ratings (M = 3.92). Motivational factors appeared multifactorial, with intrinsic aspects such as enjoyment and bonding outweighing external influences (e.g., recommendations from friends – 42.0% / or health professionals – 11/.0%). Program quality was evaluated very positively, including instructor clarity, feedback, and approachability (M = 4.73), as well as safety and organization of the environment. Overall satisfaction was high, with the vast majority of parents expressing willingness to recommend the program (100%) and continue participation (95.4%). In conclusion, infant swimming programs are perceived by parents as highly beneficial for early childhood development, emotional bonding, and water familiarization. These findings highlight the importance of such programs in promoting early engagement in physical activity and supporting holistic child development.

Keywords: Baby swimming, parental perceptions, online study

IMPLEMENTATION OF OUTDOOR ACTIVITY PROGRAMS TO ENCHANCE THE TOURISM EXPERIENCE

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In recent years, a gradual transition has been observed from traditional mass tourism to a more contemporary form of tourism, which places greater emphasis on alternative and sustainable forms of development and demonstrates a strong interest in service quality, experiential activities, and direct interaction with the environment. This shift reflects changing tourist preferences, as modern travelers increasingly seek meaningful, personalized, and environmentally responsible experiences. Activities such as hiking, cycling, mountaineering, rock climbing, and water sports now constitute a key component of modern tourism products, contributing both to their diversification and to the sustainable development of tourist destinations. The aim of the present study was to investigate the role of outdoor activity programs in the development and enhancement of the tourism experience through a comprehensive review of the existing literature. In this context, the main theoretical concepts and their interrelationships were analyzed, while key theoretical models of the tourism experience were presented. Particular emphasis was placed on exploring the relationship between participation in outdoor activities and factors such as satisfaction, well-being, and the strengthening of individuals' connection with the natural environment. Furthermore, the study examined the multiple benefits of outdoor activity programs for participants, local communities, and the natural environment, including economic development, social cohesion, and environmental awareness. At the same time, it addressed key challenges and limitations, such as issues related to environmental impact, infrastructure, safety, and the need for proper management and regulation. The findings indicate that outdoor activity programs play a crucial role in shaping high-quality, authentic, and sustainable tourism experiences. They not only enhance visitor satisfaction but also contribute to local development and promote environmental consciousness. Finally, the study proposes a set of comprehensive recommendations for the effective planning and management of outdoor activity programs. These include the adoption of sustainable practices, the integration of local communities in the planning process, the development of appropriate infrastructure, and the implementation of policies that ensure environmental protection and visitor safety. These recommendations aim to support tourism professionals and policymakers in maximizing the positive impacts of outdoor tourism while ensuring the preservation of natural resources for future generations.

Keywords: Outdoor activities,Tourism experience,Sustainable tourism development,Tourism product,Participant satisfaction,Alternative tourism

INTEGRATED AND LIVEABLE SPORTS AND TOURISM DEVELOPMENT IN MOUNTAINOUS AREAS: A CASE STUDY OF THE MUNICIPALITY OF AGRAFA

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This study explores the prospects for integrated and livable development with a focus on sports and outdoor recreation in mountainous areas, using the Municipality of Agrafa as the main case study. The quality of life in remote mountainous communities is directly linked to the participation of residents, especially young people, in social and sporting events that promote physical and mental well-being. Despite the rich natural landscape and the latent potential of water sports in the Agrafa region (rivers: Acheloos, Agrafiotis, Megdovas and Lake Kremaston), sporting activity remains limited due to deficiencies in infrastructure and the absence of an organized strategy. The purpose of this research is to propose a strategic framework for the transition to a model of "integrated and livable development" that strengthens regional identity. The methodology uses a comparative analysis of successful international and national models. The Segre Olympic Park in La Seu d'Urgell, Spain, is a case in point, demonstrating how multi-purpose technical interventions (flood protection, hydroelectric power generation and sports use) transform natural resources into international training centres and year-round tourist attractions. National examples, such as Konitsa (the 'kayaking city') and Metsovo (cross-country skiing and mountain running), further demonstrate how the sporting exploitation of water and mountain elements acts as a catalyst for the local economy. The study proposes a 'bottom-up' strategy where Grassroots Sports is the basis. Through sports development programmes and targeted interventions, local athletes are developed into authentic ambassadors of their homeland. This approach ensures sustainable development that avoids mass tourism patterns, protects the pristine environment, creates new employment opportunities and keeps young people from emigrating, thus limiting the demographic decline of mountainous areas. In conclusion, synergy between local authorities, sports organizations and civil society is essential to create ideal living conditions and at the same time create a top sports recreation destination in mountainous areas. The research confirms that the development of Mass Popular Sports contributes significantly both to the quality of life of residents and to the wider economic development of the region.

Keywords: Integrated and Livable development,Sports, Outdoor Recreation, Mountainous areas, River sports

OUTDOOR ACTIVITIES AS A TOOL FOR TOURISM DESTINATION DEVELOPMENT

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In recent years, tourism has undergone a significant transformation, shifting from mass tourism models to more sustainable, experience-based forms that emphasize authenticity, active participation, and environmental responsibility. Within this context, outdoor activities have emerged as a key component of modern tourism development strategies. This research, conducted within the framework of sport tourism and recreation, aims to investigate the role of outdoor activities as a strategic tool for tourism destination development and differentiation. The primary objective is to examine how outdoor activities contribute to economic growth, social development, environmental sustainability, and the enhancement of destination competitiveness. The study adopts a mixed methodological approach, combining qualitative and quantitative elements. Data collection is based on an extensive literature review, analysis of theoretical frameworks related to sport tourism and nature-based tourism, and the examination of case studies, including the region of Messinia and cycling tourism development in Northern Italy. The study also incorporates empirical insights from tourism practices and existing research findings. The results indicate that outdoor activities, such as hiking, cycling, climbing, and water sports, significantly contribute to local economic development by generating employment opportunities and increasing demand for local services and products. Furthermore, they promote social cohesion, strengthen local identity, and foster authentic interactions between visitors and host communities. From an environmental perspective, outdoor tourism encourages sustainable practices and the responsible use of natural resources, although it also requires careful planning to prevent environmental degradation and long-term ecological imbalance. Additionally, the findings highlight the importance of destination differentiation, as outdoor activities enable regions to develop unique tourism identities and attract niche markets, thereby enhancing competitiveness and overall destination image. However, challenges related to infrastructure development, strategic planning, and stakeholder coordination are identified as key barriers. The study concludes that the effective integration of outdoor activities into tourism strategies requires coordinated action among public authorities, private stakeholders, and local communities. Strategic planning, investment in infrastructure, sustainable management, and targeted marketing are essential for maximizing the benefits of outdoor tourism and supporting long-term sustainable development.

Keywords: outdoor activities, tourism development, sport tourism, destination competitiveness, sustainable tourism, nature based tourism

SMALL- AND MEDIUM-SCALE SPORTING EVENTS AS A LEVER FOR TOURISM PROMOTION AND SUSTAINABLE REGIONAL DEVELOPMENT

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Sport tourism has emerged as a rapidly growing field that integrates physical activity with travel experiences, contributing significantly to local and regional development. While large-scale mega-events have traditionally attracted most academic and policy attention, increasing emphasis is now placed on the role of small- and medium-scale sporting events in promoting sustainable tourism and regional growth. These events are characterized by lower organizational costs, limited infrastructure requirements, and a stronger connection with local communities. The purpose of this study is to systematically review the international literature regarding the contribution of such events to tourism promotion and sustainable regional development. A systematic literature review methodology was adopted, following a structured and transparent process for identifying, selecting, and analyzing relevant studies. Data were collected from major academic databases using keywords related to sport tourism, small-scale sporting events, economic impact, destination image, and sustainability, focusing on studies published within the last decade. The findings suggest that small- and medium-scale sporting events can generate important economic benefits by increasing tourist expenditure, extending the tourism season, and supporting local businesses, while requiring relatively low financial investment. Furthermore, these events contribute to social development by enhancing community pride, encouraging local participation, and promoting healthier lifestyles among residents. From a spatial and environmental perspective, they facilitate the use and promotion of existing infrastructure and natural resources, improving the attractiveness and visibility of destinations without creating excessive environmental pressure. However, certain challenges are also identified, including temporary disruptions to residents' daily life, issues related to event organization, and the need for effective environmental management. Overall, the literature indicates that when strategically planned and properly managed, small- and medium-scale sporting events can serve as effective tools for tourism promotion and sustainable regional development. The study provides useful insights for policymakers, event organizers, and tourism stakeholders, highlighting the importance of integrating such events into long-term regional development strategies in order to maximize their positive impacts and minimize potential negative effects.

Keywords: Sport tourism, small-scale sporting events, tourism promotion, sustainable development

UNDERSTANDING THE SOCIAL LEGACY OF SPORTING EVENTS: RESIDENTS' AND NON-RESIDENTS' PERCEPTIONS OF AN LPGA TOURNAMENT

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This study investigates the multidimensional social impacts of hosting a professional sporting event by conceptualizing an LPGA tournament as a branded experience that generates both functional and symbolic legacies for the host community. Moving beyond traditional economic impact assessments, the research develops and validates a comprehensive Social Impact Scale (SIS) and applies it to compare perceptions between residents and non-residents of the host city. Grounded in Social Exchange Theory and sport branding perspectives, the study examines how golf involvement, event perception, and residency shape attitudes toward hosting and civic engagement. Study 1 focused on scale development and validation. Two focus groups (N = 12) generated 98 perceived impact statements, from which 41 items were retained for Exploratory Factor Analysis using a pilot sample (N = 227). The final 28-item, eight-factor model explained 75.3% of total variance and captured both positive and negative dimensions: Economic Benefit, Tourism Development, Community Image, Community Cohesion, Sport Interest and Participation, Disruption, Economic Burden, and Infrastructure Strain. Confirmatory Factor Analysis demonstrated strong model fit (CFI = .96, TLI = .92, RMSEA = .05), with high reliability and validity (α = .84–.93; AVE = .65–.82), supporting the SIS as a robust tool for assessing non-mega sport event impacts. Study 2 tested the structural model using survey data from 538 LPGA spectators in Lancaster, Pennsylvania (260 residents; 278 non-residents). Structural Equation Modeling indicated good model fit (CFI = .92, RMSEA = .06). For residents, golf involvement predicted event perception (β = .46), which influenced perceived economic benefit and community image; these factors significantly shaped attitudes toward hosting and enhanced civic engagement (β = .31). Among non-residents, event perception influenced economic and tourism-related impacts but did not significantly predict civic engagement. Multi-group analysis confirmed residency as a key moderator. Overall, residents emphasized tangible community benefits, whereas non-residents perceived more symbolic and sport-related gains.

Keywords: Social impacts, LPGA tournament, Non-mega sport events, Community perceptions

ΟΡΓΑΝΩΣΗ & ΜΑΡΚΕΤΙΝΓΚ ΤΟΥ ΑΘΛΗΤΙΣΜΟΥ

ORGANIZATION & MARKETING OF SPORTS

CAN THE UTILIZATION OF THE PROMOTION MIX IN BADMINTON PREDICT AUDIENCE ATTRACTION? A CASE STUDY

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Sports marketing is a complex managerial process that involves identifying the needs of (potential or actual) consumers and utilizing appropriate tools to attract, satisfy, and retain them. Attracting consumers can be even more challenging in the case of less popular sports. The aim of this study was to examine whether the utilization of the promotion mix—and more specifically sports media, sports advertising, star athletes, sports sponsorship, and national team performance—can attract audiences to the sport of badminton. The sample consisted of 104 individuals, mainly males aged 18–25, who were familiar with the sport but did not actively participate in it. Data were collected using the questionnaire developed by Sedky et al. (2022), as adapted into Greek by Malamadakis et al. (2025) for less popular sports. The instrument consisted of five factors and 23 variables: (a) sports media (4 variables), (b) sports advertising (6 variables), (c) star athlete (6 variables), (d) sports sponsorship (4 variables), and (e) national team performance (4 variables). Audience attraction was also measured using a questionnaire by Sedky et al. (2022) with 4 variables, which has been validated in a Greek population with high internal validity and reliability (Malamadakis et al., 2025). All responses were recorded on a 5-point Likert scale. A regression analysis was conducted using the statistical software Jamovi, with the promotion mix factors as independent variables and audience attraction as the dependent variable. The results indicated that sports advertising, star athletes, and national team performance can predict audience attraction in less popular sports. The limited sample size does not allow for broad generalization of the findings. However, the random sampling and the internal consistency of the research factors provide a basis for useful recommendations for badminton professionals.

Keywords: badminton, sports marketing, promotion mix, audience attraction

CHILDREN'S PARTICIPATION IN SPORT EVENTS: BENEFITS AND PRINCIPLES OF EFFECTIVE ORGANIZATION

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The effective organization and management of sports academies constitute an important factor for the development of youth sport, the promotion of physical activity, and the strengthening of community engagement. The purpose of this study was to examine the organizational structure and management practices of sports academies, while also highlighting the role of sports marketing strategies, sport facilities, and their broader social impact. The research focuses on sports academies that provide training programs for children and adolescents and contribute not only to athletic development but also to social interaction and community participation. Data for the present study were collected through an extensive literature review and through online research of "best practices" implemented by sports academies both in Greece and internationally. The research design followed a descriptive and analytical approach in order to explore how organizational planning, management structures, sports facilities, and sports marketing strategies contribute to the effectiveness and sustainability of sports academies. The study highlights the importance of organizational structure, human resources, and sport facilities as essential elements that influence the operation and sustainability of sports academies. The findings of the study indicate that well-structured organizational models combined with effective sports marketing strategies can significantly enhance the visibility, participation rates, and long-term sustainability of sports academies. At the same time, the provision of appropriate sport facilities supports the effective delivery of training programs and contributes to a positive sport experience for participants. Effective communication strategies, brand identity, and relationship building with parents, athletes, and the wider community contribute to the visibility and sustainability of academies. The adoption of basic management practices, including planning, organization, and service quality management, supports the professional operation of sports organizations and enhances their ability to attract and retain participants. In conclusion, the successful organization and management of sports academies, supported by qualified human resources, proper internal coordination, and suitable sport facilities, constitute essential factors for their long-term development and for the promotion of sport as a tool for youth development and social cohesion.

Keywords: sports academies,sport management,sports marketing,human resources,sport facilities,youth sport development,organizational structure,leadership,youth

EVALUATING THE COMPLIANCE OF THE JU-JITSU INTERNATIONAL FEDERATION (JJIF) STATUTES WITH THE OLYMPIC CHARTER: IMPLICATIONS FOR INTERNATIONAL OLYMPIC COMMITTEE RECOGNITION

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The Olympic Charter constitutes the fundamental regulatory framework governing the operation of the Olympic Movement and defines the rights and obligations of International Federations. Compliance of International Sports Federations with its principles is a key prerequisite for recognition by the International Olympic Committee (IOC), although it does not automatically guarantee their inclusion in the Olympic system. The aim of the present study was to evaluate the degree of compliance of the statutes of the Ju-Jitsu International Federation (JJIF) with the provisions and principles of the Olympic Charter, within the context of the IOC recognition process. To achieve this objective, a qualitative research approach was adopted, based on content analysis and comparative evaluation of official documents. Specifically, a systematic comparison was conducted between the statutes of the JJIF and selected articles of the Olympic Charter related to governance, autonomy, anti-doping regulations, ethics, and the organizational structure of International Federations. The findings of the analysis indicate that the JJIF demonstrates a high level of institutional compliance, as it incorporates key principles of good governance, recognizes the jurisdiction of the Court of Arbitration for Sport (CAS), and adheres to the World Anti-Doping Code. Furthermore, its statutory provisions align with the fundamental values of Olympism, including equality, transparency, and the protection of sport integrity. However, the results also reveal that such compliance, although necessary, is not in itself a sufficient condition for IOC recognition. The recognition process is influenced by additional factors, such as the global development and popularity of the sport, its strategic relevance, and the broader priorities of the Olympic program. In conclusion, this study suggests that while the JJIF largely fulfills the regulatory requirements of the Olympic Charter, IOC recognition constitutes a multifactorial process that extends beyond formal institutional compliance. These findings contribute to a better understanding of the complex criteria underlying Olympic recognition and highlight the importance of both regulatory alignment and strategic positioning within the international sport system.

Keywords: Olympic Charter, International Olympic Committee Recognition, Ju-Jitsu International Federation (JJIF), Institutional Compliance, International Sports Governance

EVALUATION OF PARENTAL ATTITUDES TOWARD THE PARTICIPATION OF CHILDREN AGED 4–8 YEARS IN BASKETBALL: A CASE STUDY IN KOMOTINI

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Children's participation in organized sports from an early age is a key factor in children's physical and psychosocial development. This study aimed to examine parental attitudes toward the participation of children aged 4–8 years in basketball and to investigate whether these attitudes differ based on parents' current and/or past participation in physical activity. The sample comprised 84 parents of children enrolled in basketball academies in Komotini, Greece. Data were collected using a structured questionnaire based on the Theory of Planned Behavior (Ajzen, 2002), as conceptualized by Conner and Sparks (1996) and adapted for the Greek population by Alexandris et al. (2022). The instrument employed a seven-point Likert scale. For the purposes of this study, the following were adapted for use with the parent population: a) Attitudes, comprising seven-point Likert scale items, b) Subjective norms, comprising three variables and c) Perceived behavioral control, comprising four variables. The independent variable concerning parental participation in physical activity was derived from Iatridis et al. (2017). Data collection was conducted in both printed and electronic formats, and statistical analysis was performed using SPSS. The results indicated satisfactory reliability for the constructs of attitudes and subjective norms, whereas the reliability of perceived behavioral control was initially low but improved slightly after the removal of one item. Descriptive analysis revealed generally high scores across all constructs, with attitudes receiving the highest evaluations. Analysis of variance (ANOVA) revealed statistically significant differences only for perceived behavioral control, with parents who had engaged in physical activity solely in the past reporting higher levels compared to those who were active both in the past and at present. Although the study is primarily exploratory in nature, its findings can already be utilized by administrators of sports academies.

Keywords: basketball academies, parental attitudes, perceived behavioral control, parental exercise

FACTORS INFLUENCING FITNESS CENTER PARTICIPATION AND MEMBER RETENTION: A THEMATIC ANALYSIS OF MEMBER PERSPECTIVES

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Fitness centers are one of the main venues worldwide for participation in exercise programs, yet attracting and retaining members remains a major challenge. Numerous studies have explored consumer behavior to understand individuals' decisions to join and remain in exercise services. The aim of this study was, through interviews, to examine what influences people's decision to start exercising at a fitness center, their expectations during their first visit, and the reasons that would encourage them to remain active members. Sixty individuals (30 men and 30 women) of various ages (<18 to 60+ years) and with different levels of experience of fitness center membership participated in the study. Following an extensive literature review, the participants were asked the following open-ended questions: 'What would motivate you to start exercising in a fitness center?', 'How would you like to be treated on your first day at a fitness center?', and 'What would make you stay as a fitness center member?' Thematic analysis was used to analyze the data. The results revealed that health and appearance were the primary factors motivating participation, rather than psychological factors such as stress management or self-confidence. Regarding their first visit, participants emphasized the importance of positive and respectful treatment, while comfort was mentioned to a lesser extent. Long-term retention was mainly associated with clean facilities and experienced, well-trained staff, whereas social interaction was less frequently reported. In conclusion, the findings confirm that health- and appearance-related motives are central to attracting individuals to fitness centers. The initial experience plays a critical role in both attraction and retention, particularly through respectful treatment—an aspect that has received limited attention in previous literature. Additionally, the results highlight the importance of service quality, especially cleanliness, and the employment of specialized staff to enhance member participation and long-term commitment.

Keywords: member retention,exercise motivation,customer experience,fitness center,thematic analysis

GOING GREEN IN SPORTS CLUBS: THE IMPACT OF AN ENVIRONMENTAL CSR INTERVENTION PROGRAM ON MEMBERS' SATISFACTION AND PSYCHOLOGICAL COMMITMENT

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Over the years, Corporate Social Responsibility (CSR) has become an increasingly important way for sport organizations to engage with stakeholders and address environmental and social challenges. In participatory sport environments, CSR initiatives may also influence how members perceive the social role and responsibilities of their clubs. This study examined whether the implementation of a three-month environmental responsibility intervention program at a tennis club could influence members' perceptions of the club's environmental, economic, and social responsibility, as well as their satisfaction and psychological commitment. The intervention program consisted exclusively of environmental responsibility actions, such as recycling initiatives and the use of tennis balls made from recycled materials. A total of 250 club members participated in the study by completing questionnaires before and after the intervention. CSR perceptions were measured through nine items representing three dimensions—economic, environmental, and social initiatives—adapted from Park et al. (2015). Customer satisfaction was assessed with three items based on Maxham and Netemeyer (2002), while psychological commitment was measured using three items derived from Scanlan et al. (1993). Data were analyzed using Jamovi. After descriptive statistics and normality tests indicated non-normal distributions, Wilcoxon signed-rank tests were conducted to examine differences between the two measurement points through Paired Samples T-test. The results showed that members' perceptions of environmental responsibility increased significantly following the intervention. Perceptions of social responsibility and overall satisfaction also improved. In contrast, perceptions of economic responsibility declined significantly after the intervention. No statistically significant differences were observed in members' psychological commitment. Overall, the findings suggest that environmental initiatives can enhance members' perceptions of environmental and social responsibility and improve satisfaction. However, such initiatives alone may not be sufficient to strengthen psychological commitment. Sport organizations may therefore benefit from implementing more comprehensive CSR strategies rather than isolated initiatives.

Keywords: Corporate Social Responsibility, satisfaction, psychological commitment, sport clubs

HOW MUCH CAN THE POPULARITY OF BADMINTON INCREASE? QUESTIONNAIRE ADAPTATION & EVALUATION OF PROMOTION MIX FACTORS IN LESS POPULAR SPORTS

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The concept of "sports popularity" remains complex and multidimensional, as there is no universally accepted definition. It is typically reflected through indicators such as spectator attendance or participation in sports activities. In Greece, badminton, despite its introduction in 1988, is still considered a less popular sport. Within this context, sports marketing—and particularly the promotion mix—can serve as a key tool for enhancing its visibility. The aim of the present study was to adapt the questionnaire developed by Sedky et al. (2022) to the sport of badminton, as it has already been adapted into Greek by Malamadakis et al. (2025) for less popular sports, and to investigate the evaluation of promotion mix factors by the audience. Data were collected using the adapted 23-item questionnaire, which includes five factors: (a) sports media (4 variables), (b) sports advertising (6 variables), (c) star athlete (6 variables), (d) sports sponsorship (4 variables), and (e) national team performance (4 variables). The sample consisted of 104 individuals, mainly males, who were familiar with the sport but did not actively participate in it. Reliability analyses using Cronbach's alpha, conducted through the statistical software Jamovi, indicated high internal consistency across all factors. Descriptive analyses revealed a moderate evaluation of all promotion mix factors included in the study. Notably, participants indicated that badminton should be more actively promoted through sports media in order to gain popularity. The findings of this study can serve as a foundation for further research by sport managers, aiming to enhance the attraction of spectators, participants, and sponsors.

Keywords: badminton, marketing mix, promotion mix, visibility, less popular sports

ORGANIZATIONAL STRACTURE AND MANAGEMENT OF SPORTING EVENTS IN THE REGION OF CRETE

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In recent years, the role of local governance in the development and promotion of sport has gained increasing attention, particularly in the context of regional planning and community engagement. This study investigates the structure and organization of sport events within the Region of Crete, with particular emphasis on the role of local government authorities in the planning, management, and implementation of sport-related activities. The primary aim of the research is to explore the administrative framework of sports management at the municipal level and to evaluate the key internal and external factors influencing the organization of sport events through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. A qualitative research design was employed, utilizing semi-structured interviews as the main data collection method. The research sample consisted of three Deputy Mayors responsible for sports, representing the municipalities of Heraklion, Rethymno, and Archanes-Asterousia. Participants were selected through purposive sampling, based on their institutional role and direct involvement in decision-making processes related to sports administration and event organization. The collected data were analyzed thematically, allowing for an in-depth examination of participants' perspectives. The findings indicate that the organizational capacity of municipalities varies significantly, with larger urban areas demonstrating more developed sports infrastructure and greater administrative efficiency. In contrast, smaller municipalities face constraints related to limited financial resources, infrastructure deficiencies, and staffing challenges. Furthermore, the analysis highlights sports tourism and inter-municipal collaboration as key opportunities for regional development, while also identifying bureaucratic barriers and funding limitations as major threats. The results suggest that the effectiveness of sport event management is closely linked to organizational structure and stakeholder coordination. Overall, the study underscores the importance of strategic planning, institutional collaboration, and effective governance in enhancing the sustainability and development of sports initiatives at the regional level, offering practical insights for policymakers and local authorities.

Keywords: sport management, local government, sport events, SWOT analysis, regional development, Crete

SUSTAINABLE MARKETING AND CUSTOMER RELATIONSHIP MANAGEMENT: THE CONTRIBUTION OF ENVIRONMENTAL RESPONSIBILITY TO LONG-TERM CUSTOMER LOYALTY

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Sustainable Marketing constitutes one of the most important pillars of contemporary business strategy , as it integrates the objectives of economic growth with enviromental protection and social responsibility. The aim of this study is to examine the role of sustainable marketing and environmental responsibility in building consumer trust and long-term loyalty, with particular emphasis on customer relationship management (CRM). The study is based on a comprehensive literature review of academic articles, books and research studies related to sustainable marketing, corporate social responsibility, consumer behavior and customer loyalty. Key theoretical approaches, such as the Triple Bottom Line model, are presented, along with contemporary sustainability practices implemented by companies at both international and national levels. Furthermore, three case studies (Patagonia, Nike and Korres) are analyzed in order to illustrate how sustainability strategies can enhance corporate image, strengthen consumer trust, and contribute to the development of long-term relationships with customers. The findings indicate that companies adopting authentic and transparent sustainability practices gain a competitive advantage, and foster higher levels of customer loyalty. In addition, sustainable marketing is shown to play a crucial role in improving brand reputation and aligning corporate values with the expectations of socially and environmentally conscious consumers. The study concludes that sustainable marketing is no longer an optional strategy but a necessary approach for modern businesses, as it supports long-term value creation, strengthens corporate credibility, and promotes a more responsible and sustainable business environment.

Keywords: Sustainable marketing, Environmental responsibility, Customer relationship management, Customer loyalty, Corporate social responsibility

THE ACTIVITIES OF THE SPORTS ORGANIZATION OF THE MUNICIPALITY OF ALEXANDROUPOLI AND THE ORGANIZATION AND MANAGEMENT OF THE MAJOR COMPETITIONS IN RECENT YEARS

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THE ACTIVITIES OF THE SPORTS ORGANIZATION OF THE MUNICIPALITY OF ALEXANDROUPOLI AND THE ORGANIZATION AND MANAGEMENT OF THE MAJOR COMPETITIONS IN RECENT YEARS N. Mitiletsis 1, A. Giannakopoulos 1, G. Yfantidou 1 1Democritus University of Thrace, D.P.E.S.S., Komotini, Greece Email: mitilenick@hotmail.com The aim of this research was to study and highlight the sports activities of mass sports, exercise programs for everyone and especially for vulnerable social groups such as the unemployed, the elderly and people with disabilities, as well as the organization and administration of the most important competitions organized in the Municipality of Alexandroupolis in recent years under the auspices of the sports organization of the Municipality of Alexandroupolis. The main responsibilities of this department are the management of sports facilities, the control of safety, cleanliness and technical adequacy of the facilities, as well as the planning of sports activities and competitions of various levels and categories. Regarding mass sports activities, there is an increasing participation of citizens, as well as more variety in exercise programs and mass sports activities, always under the guidance and supervision of physical education teachers. At the same time, in the area of organizing competitions, I will refer to RUN GREECE, which has become an institution and is organized annually with the participation of athletes of various age groups and competitive levels. Other examples are the Panhellenic badminton championship of the open category for men and women, as well as the International Tournament “World Aquatics Water Polo World Cup Women” which was held at the new Municipal swimming pool. Many other events will be mentioned in the presentation of our work. The conclusion of our study is that the Municipality of Alexandroupolis, either as the main organizer or as a co-organizer of sports activities and events, presents a systematic approach to their implementation and at the same time lays the foundations and has the guarantees for even greater participation of athletes and importance of sports events and domestic and international competitions.

Keywords: Sports Organisation, Sport Science, Athletic Development

ΦΥΣΙΚΗ ΔΡΑΣΤΗΡΙΟΤΗΤΑ

PHYSICAL ACTIVITY

ACCESS TO ALTERNATIVE PHYSICAL ACTIVITY: A SYSTEMATIC LITERATURE REVIEW (SLR)

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This study aims to systematically synthesize the primary literature on barriers, facilitators, and forms of participation of minority and immigrant populations in physical activity and alternative forms thereof. Particular emphasis is placed on the structural dimension of access and the role that different contexts and ways of organizing physical activity play in shaping inequalities in participation. A Systematic Literature Review was conducted in accordance with the PRISMA 2020 guidelines, adopting a mixed-methods approach. The literature search was carried out across three major databases, Scopus, Web of Science Core Collection, and PubMed—between January and March 2025, with the search process completed in March 2025. The search was restricted to peer-reviewed articles published between 2015 and 2025, in order to ensure a focus on contemporary social, cultural, and institutional conditions influencing access to physical activity. The initial search yielded a total of 1,231 records across the three databases. Six studies that met the predefined inclusion criteria and focused on minority or immigrant populations were included in the final sample. Thematic synthesis of findings revealed that participation in physical activity is influenced by multi-level barriers, including practical constraints such as time and cost, sociocultural factors such as language and cultural perceptions, as well as structural features of the exercise settings themselves. Social support, flexibility, and perceived benefits for physical and mental health were identified as key facilitating factors. At the same time, organised forms of physical activity appear to be associated with increased structural exclusion compared to commercial or self-organised activities. The findings suggest that the field remains under-researched, with a limited number of primary studies, insufficient geographical coverage, and a limited focus on alternative or non-formal forms of physical activity. Further empirical, multi-level, and culturally sensitive research approaches are needed to better understand and address inequalities in physical activity participation.

Keywords: Systematic review, physical activity, minority populations, migrants, barriers to participation, structural exclusion, social inclusion

ATTITUDES AND AWARENESS OF SENIOR FEMALE PHYSICAL EDUCATION STUDENTS TOWARDS EXERCISE DURING MENSTRUATION

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The purpose of this study was to investigate the attitudes and awareness of senior female students towards participation in physical activity during menstruation, with the aim of evaluating the adequacy of the knowledge provided to future physical education teachers by the academic environment. A total of sixty-five (n = 65) female students (age: 21.43 ± 1.6 years), in the final stage of their undergraduate studies at the Department of Physical Education and Sport Science at Democritus University of Thrace, voluntarily participated in the study. Data were collected using a structured questionnaire consisting of 35 open- and closed-ended questions addressing menstrual-related characteristics, physical activity habits, prior athletic experience, sources of information, self-perceived knowledge, and further educational needs. Statistical analyses were conducted using SPSS software, including descriptive statistics, Spearman's rank correlation coefficient and independent samples t-tests. The results indicated that only 18.5% of the surveyed female students considered themselves well-informed, whereas 63.1% reported having some knowledge but requiring further education, and 18.5% reported uncertainty. The primary sources of menstrual-related information were family (56.9%) and the internet (20%), while only 7.7% identified the university as a source of knowledge. No statistically significant relationships were found between self-perceived knowledge and attitudes toward menstruation (r_s = −0.072, p = 0.568), or between knowledge and exercise-related variables (frequency and intensity of physical activity), indicating that practical engagement in sports does not substitute for scientific knowledge. Furthermore, no significant differences were observed between athletes and non-athletes in attitudes toward physical activity during menstruation (p = 0.073). Most female students (75.4%) supported continuing physical activity during menstruation. However, 35.4% recommended avoiding swimming, while smaller proportions suggested avoiding weight training (16.9%) and running (15.4%), reflecting the persistence of misconceptions. These findings reveal a critical gap between general awareness and applied knowledge, highlighting the important role of formal education in preparing future physical education teachers. Targeted curricular interventions are needed to correct misconceptions and strengthen evidence-based knowledge about exercise during menstruation.

Keywords: menstruation, physical activity, health education, female students, physical education

ATTITUDES OF FIRST-YEAR FEMALE PHYSICAL EDUCATION STUDENTS AT DEMOCRITUS UNIVERSITY TOWARD EXERCISE DURING MENSTRUATION

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The purpose of this study was to investigate the attitudes of first-year female students of the Department of Physical Education and Sport Science at Democritus University of Thrace towards participation in physical activity during menstruation. A total of one hundred and fifteen (n = 115) first-year female students, aged 18.24 ± 0.6 years, at the beginning of their undergraduate studies, voluntarily participated in the study. Data were collected using a structured questionnaire consisting of 35 open-ended and closed-ended questions. The questionnaire included items related to personal characteristics of the menstrual cycle, the frequency and type of physical activity performed, previous athletic experience, and symptoms experienced during menstruation, as well as the extent to which these symptoms affect their physical and psychological performance. Furthermore, the study examined the students' general perceptions regarding participation in exercise during menstruation, the potential influence of their social environment and their level of awareness of the effect of exercise on menstrual symptoms. Statistical analyses were conducted using SPSS software, including descriptive statistics and Spearman's rank correlation coefficient to examine relationships between variables. The results indicated that 33.9% of the surveyed female students were unsure about their knowledge regarding the menstrual cycle, with 44.3% feeling sufficiently informed but needed further clarification. Furthermore, 54.8% of participants perceived that their performance was affected physically and psychologically, while 47% avoided training for 1-4 days and 35.7% felt uncomfortable exercising during menstrual phase. A significant relationship was observed between comfort in exercising and symptom intensity, while no significant differences emerged between athletes and recreational exercisers. In addition, higher self-perceived knowledge was associated with easier communication about menstrual issues. The conclusions of the present study contribute to a better understanding of female students' perceptions and behaviors regarding physical activity during menstruation. In addition, they highlight the need for targeted education and awareness among future physical education professionals concerning the management of dysmenorrhea through exercise and the individualized adaptation of training programs during this period.

Keywords: Keywords: menstruation, physical activity, dysmenorrhea, exercise abstinence

BRIEF FUNCTIONAL MOVEMENT INTERVENTION IN THE WORKPLACE: EXAMINING CHANGES IN PERCEIVED MUSCULOSKELETAL PAIN AND MOOD AMONG OFFICE EMPLOYEES

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This study examined the effects of a brief functional movement intervention implemented during working hours on perceived musculoskeletal pain and mood among office employees. Seven employees (n=7) participated in a four-week program consisting of two sessions per week, lasting approximately 15 minutes each. The intervention included mobility, activation and ergonomic re-education exercises performed mainly in a seated position, allowing participation without disrupting the normal workflow. Evaluation was conducted using the WHO-5 Well-Being Index, the Perceived Stress Scale (PSS-10) and the International Physical Activity Questionnaire – Short Form (IPAQ-SF), along with repeated measurements of the Visual Analogue Scale (VAS) for pain and the Emotions Scale (EMS) prior to each session. Descriptive analysis indicated favourable trends toward reduced neck and low back discomfort (VAS) and improvements in emotional state (EMS) during the intervention period, while participation remained stable within the real workplace environment. These findings suggest that brief functional movement interventions implemented during working hours may represent a feasible approach for addressing musculoskeletal discomfort and supporting employee wellbeing. Further research with larger samples is required to confirm these preliminary observations.

Keywords: workplace exercise, functional movement, musculoskeletal pain, wellbeing

CENTRALLY OBESE SCHOOLCHILDREN WITH ADEQUATE CARDIOVASCULAR FITNESS HAD A BETTER LIFESTYLE PROFILE THAN NORMAL-WEIGHT ONES WITH LOW CARDIOVASCULAR FITNESS

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Obesity and low levels of physical fitness (PF) are serious public health issues that could adversely affect health in later life. The aim of this study was to investigate the relationships between schoolchildren's cardiorespiratory fitness (CRF), obesity status clusters, and lifestyle profiles. A total of 177,091 schoolchildren aged 6 to 18 years old participated in the study. Trained physical education teachers measured students' anthropometric characteristics and PF levels using the Euro-fit test battery, evaluating them in accordance with established criteria. Lifestyle behaviors were evaluated with a standardized questionnaire, and four profiles were identified: (1) Normal weight & Fit; (2) Normal weight & Unfit; (3) Centrally obese & Fit; and (4) Centrally obese & Unfit. Normal weight participants with moderate/high CRF presented healthier findings in all lifestyle factors and better PF outcomes than sub-groups with low CRF (all P-values<0.05). Participants classified as centrally obese with moderate/high CRF had healthier dietary habits, less screen time, more sleep, and better PF measurements than non-obese peers with low CRF (all P-values<0.05). Centrally obese individuals with moderate/high CRF had increased odds by 47% and 33%, for sufficient dietary habits, 26% and 10% for acceptable screen time, 56% and 33% for adequate physical activity (PA), and 23% and 12% for adequate sleep, for boys and girls, respectively, compared to normal weight children with low CRF. Moreover, centrally obese participants with moderate/high CRF from both sexes presented increased odds for moderate/high performances in all PF tests (i.e., strength, flexibility, speed, and agility) as compared to normal weight peers with low CRF. Participants with profiles characterized by higher CRF levels demonstrated better lifestyle profiles and PF outcomes compared to those with unfit profiles, regardless weight status. These findings underscore the importance of maintaining adequate levels of CRF, even in the presence of overweight or obesity, to support a healthier life in children and adolescents.

Keywords: Aerobic fitness, overweight, children, adolescents, physical fitness, central obesity

EFFECTS OF A SCHOOL-BASED EDUCATIONAL INTERVENTION ON LIFESTYLE HABITS AND WELLBEING IN ITALIAN ADOLESCENTS: RESULTS FROM THE DUSE PROJECT

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The increasing prevalence of unhealthy dietary habits and sedentary lifestyles among adolescents represents a major risk factor for the development of non-communicable diseases, including Type 2 Diabetes Mellitus. The European project “Counteracting Diabetes Using Strategies in Education (DUSE)” provided school-based interventions integrating nutrition education and physical activity as effective strategies to promote healthy behaviors. The education was provided to 238 middle- and high-school students, 12 and 16 years respectively. A non-invasive, pre-post intervention design was adopted. Participants completed three validated questionnaires (KIDMED, PAQ-A, KIDSCREEN-27). In addition, food diaries were collected in a subsample to obtain qualitative data on dietary intake. Statistical analyses included descriptive statistics, normality testing, correlation (Spearman), and regression models to explore relationships between sedentary behavior, dietary habits, and psychological wellbeing. Valid questionnaire data were obtained from 67 middle-school and 57 high-school students. In addition, food diaries were collected in a subsample of 92 students (49 middle school and 43 high school students) who completed both the diary and the questionnaire, allowing for integrated dietary analysis. The adherence to the Mediterranean diet was moderate (mean KIDMED 4.5), with only 9% of participants showing high adherence and 28% low adherence. Food diary analysis revealed low consumption of fruit and vegetables, with most students reporting intake frequencies below recommended levels. Breakfast habits were relatively widespread, although a higher tendency to skip breakfast was observed in females. Regression analyses showed that specific healthy eating behaviors (e.g., regular breakfast consumption) were significantly associated with higher adherence to the Mediterranean diet ($p = 0.035$), while lower sedentary behavior was associated with healthier dietary habits ($p = 0.004$). Post-intervention data indicated improvements in dietary choices, increased awareness of healthy habits, and a shift toward healthier snacks and breakfast patterns. These results highlight critical lifestyle issues in adolescents, particularly low adherence to healthy dietary patterns and high variability in behaviors. The educational interventions promoted improvements in dietary awareness and habits, although behavioral changes remain to elucidate. These findings support the importance of targeted, school-based strategies to foster sustainable healthy lifestyles in adolescents.

Keywords: Lifestyle, education, health, nutrition, physical activity

EXAMINING THE RELATIONSHIP BETWEEN E-SPORTS PARTICIPATION AND PHYSICAL ACTIVITY LEVELS IN SPORTS SCIENCE STUDENTS

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EXAMINING THE RELATIONSHIP BETWEEN E-SPORTS PARTICIPATION AND PHYSICAL ACTIVITY LEVELS IN SPORTS SCIENCE STUDENTS Abstract The rapid advancement of digital technologies has significantly transformed leisure behaviors among university students, leading to increased engagement in e-sports activities. Although sports science students are expected to maintain high levels of physical activity, their participation in sedentary digital environments such as e-sports represents an important research domain. This study aims to examine the relationship between e-sports participation and physical activity levels among sports science students. A quantitative correlational research design was employed. Data were collected from university students studying in sports science faculties using the International Physical Activity Questionnaire (IPAQ) and the E-Sports Participation Motivation Scale. Descriptive statistics and Pearson correlation analysis were conducted. The findings revealed a significant positive relationship between physical activity levels and e-sports participation motivation. Physically active students also demonstrated higher engagement in e-sports, particularly in dimensions such as competition, achievement, and social interaction. The results suggest that e-sports should not be considered solely as a sedentary activity but rather as a complementary recreational domain alongside physical activity. These findings contribute to the understanding of hybrid recreational behaviors among university students.

Keywords: E-sports, physical activity, sports science students, recreation, motivation

PHYSICAL ACTIVITY LEVELS AND MEDITERRANEAN DIET ADHERENCE: A COMPARATIVE STUDY BETWEEN PHYSICALLY ACTIVE AND SEDENTARY INDIVIDUALS

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Regular physical activity and balanced nutrition are essential components of modern preventive medicine. They support metabolic regulation, maintain optimal physiological function, and promote overall health. Together, they contribute to improved cardiovascular performance, effective weight management, and enhanced immunity, while significantly reducing the risk of chronic non-communicable diseases such as diabetes and heart disease. The aim of the present study was to examine and compare lifestyle behaviors, with particular emphasis on adherence to the Mediterranean diet and non-exercise physical activity levels, between physically active (people who exercise regularly for at least two times per week) and sedentary (people who do not exercise regularly for at least one year) individuals. The study sample consisted of 20 participants, divided into two groups: an active group (AG, n=10, age 28.1±3.8 years, height 170.14±10.73cm, weight 68.70±8.46kg, and BMI 24.55±2.62kg/m2) and a sedentary group (SG, n=10, age, 27.9±3.3 years, height 178.40±9.67cm, weight 72.40±5.64kg, and BMI 26.29±1.99kg/m2). Dietary habits were assessed using the Mediterranean Diet Score (MEDscore), while total daily physical activity was evaluated through the Global Physical Activity Questionnaire (GPAQ) and expressed as the PAtotal index (min/week). The results indicated that the AG demonstrated a higher mean MEDscore (8.40±1.78) compared to the SG (6.20±2.86), suggesting a positive association between regular exercise and healthier dietary patterns. In addition, total physical activity levels were substantially higher in the AG (1881.75±992.25min/week) than in the SG (509.40±532.83min/week). Although the groups were similar in terms of age, the observed differences in BMI and activity indices are primarily attributable to lifestyle-related behaviors. In conclusion, individuals who engage in systematic exercise not only exhibit higher overall physical activity levels but also demonstrate greater adherence to the Mediterranean dietary pattern. These findings highlight the importance of promoting a multidimensional approach to health, integrating structured exercise with nutritional education, in order to enhance overall well-being.

Keywords: Mediterranean diet,physical activity,sedentary lifestyle,healthy nutrition,chronic diseases

SOCIAL CAPITAL AND SPORTS ACTIVITIES. THE CONTRIBUTION OF SOCIAL CAPITAL TO STRENGTHENING THE RELATIONSHIPS OF INDIVIDUALS INVOLVED IN SPORTS ACTIVITIES (GROUP RUNNING, GROUP GYMNASTICS IN CLASSES)

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Social capital refers to the social bonds, relationships of trust, reciprocity and solidarity that are created through interpersonal interactions and social networks. Although the concept has existed for several decades, systematic research and study has been carried out since the 1970s-80s and later. The main theorists of social capital are P. Bourdieu, P. Putnam and J. S. Coleman. According to Bourdieu, "Social capital is the sum of the real or potential resources associated with the possession of a viable network, with more or less institutionalized relationships, of mutual acquaintance and recognition – or in other words – the membership in a group, which provides its members with the support of the possession of capital, giving them the right to derive advantages, in every sense of the term" (Bourdieu, 1986: 248). Participation in sports activities and running events, especially in the last two decades, has increased significantly. The concepts of diversity and inclusion, participation in sports clubs, are discussed extensively in the public sphere. Several studies highlight the contribution of sport to strengthening social capital, constituting a powerful tool for developing social capital by strengthening networks, trust, but also solidarity and cooperation among participants. Social capital can offer ideas and solutions around these issues. With this research, the aim is to study social capital in sports activities and how its integration will contribute to improving and enhancing citizens' participation in sports activities, and to strengthening social capital for the benefit of the entire sports and local community. A quantitative analysis will be carried out using questionnaires regarding the study of social capital in groups of individuals who participate in team sports activities as well as in running clubs.

Keywords: social capital, sports activities, networks, cooperation

THE EFFECTS OF LACK OF PHYSICAL ACTIVITY DURING INFANCY (0-12 MONTHS)

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Physical activity is a fundamental factor for normal physical and neurodevelopmental progression during infancy. Lack of physical activity during infancy (0–12 months) may significantly affect a child's developmental trajectory. The aim of the present study was to review the literature regarding the effects of physical inactivity in infants aged 0–12 months. A literature search was conducted in the electronic databases Scopus, PubMed, and Google Scholar. The inclusion criteria were: (a) research articles, (b) publications within the last 10 years, and (c) articles written in English. The keywords used were: "Exercise", "Physical Activity", "Inactivity", "Infant", and "Development". The results suggest that during the first year of life, infants experience rapid physical, motor, and neurological development. Limited physical activity may negatively affect the achievement of important developmental milestones, such as sitting, crawling, supporting the body, and attempting first steps. Motor skills are key indicators of typical development, and delays in their acquisition may affect overall functionality and development. Reduced physical activity is also associated with fewer opportunities for environmental exploration. Movement enables infants to interact with objects and people, thereby enhancing learning and skill acquisition. When movement is limited, environmental stimuli are reduced, which may negatively affect cognitive development. Moreover, restricted mobility may impact language and social communication development, as motor experiences are closely linked to social interaction and learning processes. Increased sedentary behavior later in life is also a significant consequence of low physical activity during infancy and childhood. Behaviors such as prolonged sitting or lying down and excessive screen exposure have been associated with negative outcomes in physical fitness and long-term health, including sleep disturbances, reduced cognitive performance, and lower psychosocial well-being. Finally, lack of physical activity in early life may influence the development of healthy movement habits in the future. Physical activity patterns established early in life tend to persist into later developmental stages. Therefore, limited activity during infancy may increase the likelihood of lower physical activity levels during childhood and adolescence, which is associated with a higher risk of health problems.

Keywords: exercise, physical activity, inactivity, infant, development

THE EFFECTS OF PHYSICAL ACTIVITY DURING INFANCY (0-12 MONTHS)

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Physical activity during infancy (0–12 months) constitutes a significant factor for a child's overall development and health. It contributes to the enhancement of motor development, muscular strength, and coordination, while also supporting neurodevelopmental maturation. Furthermore, the early incorporation of appropriate forms of movement appears to have a positive impact on cognitive development and learning abilities in later stages of life. The purpose of the present study was to review the literature regarding the effects of physical activity in infants aged 0–12 months. For this purpose, a search was conducted in electronic databases including Scopus, PubMed, and Google Scholar. The inclusion criteria were: (a) research articles, (b) publications from the last 10 years, and (c) articles written in English. The keywords used for data collection were: "Exercise", "Physical Activity", "Infant", and "Development". The literature review indicates that during the first year of life, infants undergo rapid physical and neurological development, and motor activity plays a crucial role in shaping fundamental developmental skills. Movement and active play enhance both gross and fine motor skills, including sitting, crawling, grasping objects, and later standing and taking first steps. At the same time, physical activity contributes to the healthy development of the musculoskeletal system and improves body composition. Equally important are the effects of physical activity on cognitive and psychosocial development. Through movement, infants explore their environment, enhancing learning, perception, and thinking processes. The frequency and variety of movement are linked to more advanced language and social skills, as infants gain more opportunities to interact with their surroundings and caregivers. Additionally, early participation in physical activity contributes to the establishment of healthy habits in later life. Early motor skill development appears to be associated with higher levels of physical activity during preschool and school age. In conclusion, physical activity during infancy not only influences immediate developmental outcomes but also has long-term effects on health and lifestyle. It contributes to motor, physical, cognitive, and psychosocial development, while also laying the foundation for healthy movement behaviors in the future. Therefore, encouraging physical activity and active play from the earliest stages of life is considered essential for the holistic development of the child.

Keywords: physical activity, infants, development

ΦΥΣΙΚΗ ΑΓΩΓΗ ΣΤΗΝ Α' ΒΑΘΜΙΑ & Β' ΒΑΘΜΙΑ ΕΚΠΑΙΔΕΥΣΗ

PHYSICAL EDUCATION IN ELEMENTARY & SECONDARY EDUCATION

«MED_SCHOOL»: A HEALTH EDUCATION PROGRAM INFORMING AND RAISING AWARENESS AMONG SECONDARY EDUCATION STUDENTS ON EXERCISE AND NUTRITION

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Since 2013, the educational program “Med_School” has been organized by the Laboratory of Pharmacology of the School of Medicine at the Aristotle University of Thessaloniki (AUTH) and is implemented by medical students. This initiative aims to provide evidence-based education and raise awareness among secondary education students regarding issues of significant medico-social interest, such as smoking, alcohol consumption, proper nutrition, and physical exercise. The purpose of this presentation is to highlight the program’s significance and the mobilization of appropriately trained student volunteers and graduates on a voluntary basis, aiming to cultivate a sense of responsibility regarding prevention, information dissemination, and the safeguarding of community health. To ensure optimal knowledge transfer, stimulate student interest, and provide scientifically sound answers to their inquiries, a comprehensive audiovisual curriculum was developed and approved by the Ministry of Education and Religious Affairs. This material includes essential information regarding high-interest medico-social issues and their therapeutic management. Through the “Med_School” program, students in schools across the Prefectures of Thessaloniki, Chalkidiki, Kilkis, and other regions received thorough information on topics including addictive substances, smoking, vaping, alcohol, energy drinks, nutrition, and sports. Utilizing the program’s communication channels, students continued to interact with the team to resolve queries related to the aforementioned subjects. The long-standing presence of the program underscores the urgent need to support health education initiatives within Greek schools. It appears that issues such as substance addiction or increased alcohol use among students require further awareness from both the educational community and the medical field to ensure proactive intervention through timely information.

Keywords: prevention, awareness, wellness, health education program, sports, nutrition, students.

ASSESSMENT OF PHYSICAL EDUCATION TEACHERS' INTERCULTURAL COMPETENCE, READINESS, AND CAPACITY

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The increasing cultural heterogeneity of contemporary school classrooms renders teachers' intercultural competence, readiness, and capability critical for the effective management of teaching and the promotion of inclusive practices. The investigation of these attributes is particularly important within the context of contemporary educational settings. The purpose of the present study was to assess the levels of intercultural competence, readiness, and capability of Physical Education Teachers (PETs), to examine the reliability of the instruments used, and to explore the relationships among the variables under study. A total of 122 PETs participated in the study (M = 57.58, SD = 4.73), with an equal gender distribution (50% male, 50% female). Participants were drawn from primary (58.8%) and secondary education (41.2%), and from the regional units of Rodopi (31.1%), Xanthi (41.8%), and Drama (27%). Data were collected using anonymous questionnaires assessing: (a) intercultural competence, (b) intercultural readiness, and (c) intercultural capability. Data analysis included descriptive statistics, reliability analysis, and the examination of linear correlations among the variables. The results indicated that PETs demonstrated moderate to high levels across all examined dimensions. All scales exhibited satisfactory reliability, while statistically significant positive correlations emerged among all variables, suggesting that the examined constructs are closely interrelated and tend to co-occur. Overall, the findings highlight the importance of developing intercultural skills within the framework of PETs' professional development, as Physical Education constitutes a key domain of social interaction and multicultural coexistence, where the effective management of diversity emerges as a central pedagogical challenge. Finally, the need for targeted interventions and structured professional development initiatives in the field of education is emphasized.

Keywords: Intercultural Education, Teachers' Attitudes, Physical Education Teachers' Professional Development

BARRIERS AND BENEFITS IN PRIMARY SCHOOL SWIMMING PROGRAM: EVIDENCE FROM PHYSICAL EDUCATION TEACHERS' PERSPECTIVES

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This study explores the views and experiences of physical education (PE) teachers regarding the implementation of a school-based swimming education program. Data were collected through an online survey (Microsoft Forms) voluntarily completed by 22 participants (14 female / 8 male) from the region of Thessaloniki. The survey questionnaire comprised 21 questions divided into 8 Likert-type, 4 open-ended, and 11 multiple-choice or yes/no questions. The majority of participants had over 21 years of teaching experience. Water safety was identified as the primary objective by most respondents (86%), followed by the development of basic swimming skills (64%) and the enhancement of students' confidence (43%). Descriptive analysis (1 to 5 Likert scale; strongly disagree to strongly agree) revealed that the program was positively evaluated in terms of achieving its goals (M=4.64), contributing to children's safety in water (M=4.43), and adapting to students' diverse needs (M=4.50). Additionally, PE teachers reported high levels of satisfaction with the organization of the program (M=4.50) and collaboration with colleagues (M=4.29). Most participants also felt adequately prepared to deliver the lessons (86%), although they expressed interest in further professional development, particularly in areas such as water safety protocols and managing students with aquaphobia (34%), and differentiating instruction based on skill levels (22%). Despite the positive evaluations, several challenges were identified. The most prominent issues include inadequate infrastructure (64%), and insufficient equipment (38%). A significant proportion of the respondents reported that available equipment, such as flotation devices and teaching aids, is insufficient (67%). Furthermore, although lifeguard presence was generally considered adequate (64%), a notable minority expressed concerns about staffing levels (36%). In the final section of the survey, which included open-ended questions, PE teachers highlighted the need for improvements, including increased funding, better facilities, more specialized staff in swimming, and the expansion of the program to more schools. Finally, logistical difficulties related to student transportation, often linked to financial constraints, were recorded. The findings suggest that while the swimming education program is valued and largely successful in achieving its core objectives, addressing structural and organizational limitations is essential for enhancing its effectiveness and sustainability.

Keywords: Teacher perceptions, school swim program, online study

DETERMINANTS OF SUSTAINABILITY IMPLEMENTATION IN PHYSICAL EDUCATION: PRELIMINARY FINDINGS OF RESEARCH IN GREEK SCHOOLS

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In an increasingly uncertain global environment, sustainability remains an important priority, as resilient and adaptive approaches are needed to combat climate change, geopolitical challenges and economic disruption. Physical education teachers can play a crucial role in promoting sustainability and supporting Sustainable Development Goals, thereby effectively empowering the citizens of tomorrow. Educational tools and learning activities introduced by the Greek Ministry of Education, such as Environmental Education, Skills Workshops and the Active Citizenship Curriculum, are at the disposal of physical education teachers and can be meaningfully integrated in physical education. Still, Education for Sustainable Development in Greece relies mainly on teachers' voluntary actions. The current study aims to present the preliminary findings of ongoing research in Greek physical education teachers' sustainability consciousness and the determinants of implementation of sustainability educational tools provided by policymakers. A questionnaire, consisting of two parts, was answered by 237 physical education teachers of primary and secondary education, in March 2026. The first part of the questionnaire consisted of the short-version Greek Sustainability Consciousness Questionnaire (SCQ). The second part was created based on an extensive literature review and in-depth discussions with PE teachers regarding sustainability implementation and its determinants, e.g. sustainability training, school support etc., as well as barriers to implementation, e.g. lack of training, time constraints, large class size etc. Part two of the questionnaire has been tested for internal consistency reliability (Cronbach's a=0.85) and upon completion of data collection, further analysis will be implemented to create a useful tool for further research. The preliminary findings of statistical analysis reveal that across all three educational tools used by physical education teachers, age, sustainability training, employment status, organizational support, administration support and cooperation among schoolteachers are statistically significant determinants of sustainability implementation by physical education teachers in Greek schools. Barriers to implementation arise from the absence of training, and, in some programs, large class size and lack of interest by students. Interestingly, time constraints and scarcity of resources were not found to be statistically significant. Policy implications include access of physical education teachers to cost-free and outcome-oriented training, focusing on measurable skill gains in sustainability implementation.

Keywords: Sustainability in Physical Education, Education for Sustainable Development

DEVELOPING AND TESTING A POSITIVE DISCIPLINE PROGRAM FOR REDUCING AGGRESSIVE BEHAVIOR IN SCHOOL SETTINGS

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The increasing prevalence of aggressive behavior among students at earlier school ages necessitates the development of effective, evidence-based intervention strategies. Current educational practice often lacks structured programs that systematically promote positive behavioral models and social-emotional learning. This study aims to develop, implement, and evaluate a pilot program for positive education/positive discipline in school settings – PE lessons, with a focus on reducing aggressive behavior and improving students' socio-emotional competencies. The research is conducted within a 10-month project framework and follows an experimental design with control and experimental classes. The methodology integrates quantitative and qualitative approaches, including pre- and post-intervention measurements of aggression, empathy, self-regulation, and school climate. Data collection methods include standardized questionnaires, observations, sociometric analysis, expert evaluations, and focus groups. The intervention program is based on principles of positive discipline, non-violent communication, and social-emotional learning. It includes structured activities applicable to both general classroom settings and physical education and sport contexts, where competitive and verbal aggression are often observed. Expected outcomes include a statistically significant reduction in aggressive behavior in experimental groups, improvement in emotional regulation and empathy, and enhancement of the overall classroom climate. The study is also expected to yield a validated model of a "positive classroom" and practical guidelines for teachers, school psychologists, and coaches. The scientific contribution of the research lies in providing empirical evidence of the effectiveness of positive education approaches and in developing practical tools for educational practice.

Keywords: aggression, prevention, intervention program, school environment, physical education

DIMENSIONS OF THE THEORY OF PLANNED BEHAVIOR IN CHILDHOOD AND ADOLESCENCE (AGES 4-18): A DECADAL LITERATURE REVIEW IN PHYSICAL EDUCATION

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Promoting physical activity during childhood and adolescence constitutes a major public health challenge, with the Theory of Planned Behavior (TPB) serving as a fundamental framework for understanding the psychological determinants of these habits. The purpose of this study was to evaluate how TPB variables—attitudes, subjective norms, and perceived behavioral control (PBC)—have predicted children's activity levels over the last decade (2016-2026). The methodology involved a comprehensive search of major databases (Google Scholar, Scopus, PubMed), using strict inclusion criteria focused on peer-reviewed meta-analyses and longitudinal studies. Research was evaluated based on the validity of TPB psychometric tools and the relevance of findings to school-based physical education. Results indicate that while TPB remains a robust tool—explaining 45% of intention but only 21% of actual behavior—the "intention-behavior gap" persists. A key finding pertains to developmental shifts: while parental influence is decisive for children aged 4-6, its impact diminishes during adolescence, where peer influence and autonomous motivation become dominant. Furthermore, recent data suggest that fostering intention alone is insufficient for lasting change. Modern research proposes integrating TPB with volitional models, such as Multi-Process Action Control (M-PAC), focusing on habit formation and self-regulation. In terms of practical application, these findings suggest that Physical Education curricula should move beyond general motivation toward personalized "action-planning" strategies, utilizing digital goal-setting tools to foster long-term behavioral maintenance. In conclusion, physical education must evolve beyond mere "persuasion" and instead offer age-appropriate strategies that assist students in translating the decision to exercise into a permanent daily habit.

Keywords: Theory of Planned Behavior (TPB), Attitudes, Perceived Behavioral Control (PBC), Intention, Childhood, Adolescence.

FROM EGO TO WE: AN INTERVENTION STUDY ON SELF-TRANSCENDENCE GOALS IN PHYSICAL EDUCATION

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Achievement Goal Theory has traditionally focused on self-centered goals, such as Mastery/Self-Improvement and Performance/Self-Enhancement. Recently, the SESIST model highlighted the importance of Self-Transcendence goals, defined as the individual's striving to improve others' competence. The present study aimed to evaluate a 6-week Physical Education (PE) intervention program designed to enhance the perceived Self-Transcendence climate and students' adoption of corresponding goals, while reducing the focus on self-enhancement. The sample consisted of 316 tenth-grade students, assigned to an Experimental group (n=199) and a Control group (n=117). Data were collected using the SESIST questionnaire for personal goals and the adapted PE Climate Questionnaire for perceived teacher climate. Two measurements (pre- and post-intervention) were conducted, and data were analyzed using Repeated Measures ANOVA. The results revealed statistically significant Time x Group interactions. Specifically, students in the Experimental group showed a significant increase in perceived Teacher Self-Transcendence Climate and the adoption of Self-Transcendence Goals. Conversely, in the Control group, both Teacher Self-Enhancement Climate and Self-Enhancement Goals increased significantly. Furthermore, Mastery Goals remained at high levels for both groups, confirming that the promotion of self-transcendence did not compromise their pursuit of personal improvement. In conclusion, this intervention empirically confirms that the motivational climate structured by the teacher is a crucial determinant of students' goal adoption. The research documents that PE teachers can actively shift students' focus from self-enhancement to self-transcendence, without sacrificing the pursuit of personal improvement.

Keywords: achievement goal theory, motivational climate, SESIST.

GENDER DIFFERENCES IN ACADEMIC MOTIVATION AMONG FIRST-YEAR SPORT SCIENCE STUDENTS: ASSOCIATIONS WITH DEGREE GRADE AND GRADUATION DELAY. A FIVE-YEAR PROSPECTIVE STUDY

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Lower degree grades and delayed graduation have negative consequences for both students and higher education institutions. The present prospective study examined two interrelated factors—academic motivation and gender—that may influence these outcomes. First-year students (n = 179, 75 females, 97 in academic year 2013/2014, 82 in academic year 2014/2015) from a Physical Education and Sport Science Department in Greece, completed an adapted version of the Perceived Locus of Causality Scale (Goudas et al., 1994) during the middle of their first semester. The Perceived Locus of Causality Scale taps five different types of motivation: Intrinsic, Identified, Introjected, External and Amotivation. Upon graduation, their final degree grades were collected. A Multivariate Analysis of Variance with gender as an independent variable and the five types of motivation provided an overall multivariate effect (Pillais Trace = .74, F (5, 169) = 2.68, p = .023). Subsequent univariate F tests showed that females scored significantly higher on intrinsic motivation (F (1,173) = 7.18, p = .009) and on identified motivation (F (1, 173) = 9.73, p = .002). Females had also higher degree grade (F (1, 172) = 7.92, p = .005). Finally, females graduated earlier than males (Pearson's $\chi 2$ (8) = 20.59, p = .008). These results offer valuable insights for the design and implementation of targeted initiatives aimed at improving academic outcomes. The research is conducted in the operating framework of the University of Thessaly Innovation, Technology Transfer Unit and Entrepreneurship Center "One Planet Thessaly", under the "University of Thessaly Grants for Scientific Publication Support" action and is funded by the Special Account of Research Grants of the University of Thessaly.

Keywords: Gender differences, Academic motivation, Prospective

INTEGRATING INJURY PREVENTION IN SECONDARY EDUCATION: EFFECTS OF THE FIFA 11+ PROTOCOL ON MUSCULOSKELETAL STIFFNESS AND SUBJECTIVE WELL-BEING OF HIGH SCHOOL STUDENTS

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During high school, Greek students often go through significant lifestyle changes due to increased academic demands and prolonged sedentary behavior (school/tutoring). This physical inactivity leads to increased muscle stiffness and reduced subjective well-being, which consequently raises the injury risk during physical activity. This study evaluated the impact that a single session of the FIFA 11+ protocol has on the muscle stiffness and subjective well-being of high school students, serving as a practical intervention against their sedentary daily routine. The study sample consisted of fifteen (N=15) 10th grade high school students (ages 15-16). The intervention involved implementing the FIFA 11+ injury prevention protocol as part of a 55-minute physical education session. A pre-test and post-test design was used to collect data via anonymous self-reported questionnaires. Specifically, students rated their subjective well-being and muscle stiffness on a 5-point Likert scale (1 = very low, 5 = very high). Additionally, the Borg CR-10 scale was used to measure perceived exertion. The 5-point Likert scale was also used to examine the program's perceived usefulness for injury prevention. Statistical significance was measured using the Wilcoxon signed-rank test. Statistical analysis revealed a significant 30.0% increase in subjective well-being (from 2.87 ± 0.72 to 3.73 ± 0.68, $p = 0.005$) and a significant 26.6% decrease in muscle stiffness (from 3.00 ± 0.89 to 2.20 ± 0.91, $p = 0.005$). The mean of the rate of perceived exertion (RPE) was 4.47/10, indicating a moderate and safe intensity level for school PE. Furthermore, students highly rated the exercises usefulness in injury prevention, with a mean score of 3.87/5 on the Likert scale. In conclusion, even a single repetition of the FIFA 11+ protocol in a school PE setting proved to be an effective and well-tolerated intervention to counteract the physical fatigue and stiffness resulting from the demanding academic routine. The findings suggest that integrating injury prevention protocols into the physical education curriculum can provide immediate physical and psychological benefits. Moreover, such interventions promote better health and physical readiness among students, setting the foundations for many safe sport activities in the years to come.

Keywords: FIFA 11+, Physical Education, Muscle Stiffness, Subjective Well-being, Injury Prevention, High School Students

MAPPING EDUCATIONAL INTERVENTIONS FOR ROMA STUDENTS: THE NEED FOR SYSTEMATIC DOCUMENTATION IN PHYSICAL EDUCATION

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The education and social inclusion of Roma students continue to constitute significant challenges for the Greek educational system, particularly in the subject of Physical Education, where cooperation, participation, and social interaction are fundamental components of the learning process. Despite the existence of numerous interventions over the past decades, the overall picture of the actions implemented remains fragmented. This is largely due to the fact that these interventions originate from different stakeholders, including university research groups, academic programs, and an unknown number of NGOs operating at local or national level. The aim of the present study was to collect, record, and analyze the available interventions and actions identified through online searches and evaluation reports produced by university institutions. This mapping seeks to contribute to the potential creation of a detailed and well-documented archive that presents the range of interventions, the approaches applied, their specific characteristics, and the outcomes that have emerged. At the same time, it aims to highlight possible gaps or needs that continue to exist within this particular field of educational policy and practice. The findings indicate that, despite the large number of initiatives implemented by various organizations, most of them have focused on improving access to education, increasing school attendance, and reducing school dropout rates. In contrast, initiatives specifically related to Physical Education are extremely limited or even non-existent and are often fragmented. The lack of specialized interventions in Physical Education is critical, given that this subject constitutes an important space for fostering cooperation, participation, and social cohesion among students. Overall, the mapping of implemented actions highlights both the significant efforts that have been made and the need for more targeted, sustainable, and pedagogically grounded interventions, particularly within the framework of Physical Education, where participation and social interaction can serve as key drivers for the meaningful inclusion of Roma students.

Keywords: Roma education, Physical Education, Inclusion, Educational interventions

PHYSICAL ACTIVITY AND MEDITERRANEAN DIET IN GREEK ELEMENTARY SCHOOLCHILDREN: PRELIMINARY RESULTS IN THE FRAME OF THE 'DUSE' PROJECT

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Research has shown that the Mediterranean Diet (MD), rich in vegetables, legumes, fruits, cereals, and olive oil as the main fat source, contributes to good health and longevity, while physical activity (PA) is key in preventing non-communicable diseases. Their promotion, especially in childhood, is vital for lifelong adoption. This study, which is part of the European program "Counteracting Diabetes Using Interdisciplinary Educative Programs – DUSE", investigated PA and adherence to MD among Greek boys and girls. The sample included 234 children aged 9–13 years (M = 10.76, SD = 0.71), 110 boys and 124 girls from elementary schools in East Macedonia and Thrace, Greece. PA was assessed using the self-reported Physical Activity Questionnaire for Older Children (PAQ-C), a 10-item instrument evaluating PA levels over the past week across contexts (e.g., school and leisure). Adherence to MD was measured using the 16-item KIDMED 2.0 questionnaire on dietary habits. Descriptive statistics showed that 44.6% of children were classified as participants in the low (scores 1.00–2.99), 45.5% in the moderate (scores 3.00–3.99), and 9.9% in the high PA level (scores 4.00–5.00). Significant gender differences were found in PA during school recess, lunchtime, weekends, last week's PA frequency, and total PAQ-C score, favoring boys. Regarding MD, 10.2% were classified as low (scores ≤3), 41.3% as moderate (scores 4–7), and 48.5% as high (scores 8–12) adherence to it. However, more than a third of participants reported low consumption of whole grain products and frequent consumption of soft drinks, industrial pastries, processed products, and fast food weekly. Boys and girls showed similar MD adherence. The chi-square test for independence indicated no significant association between KIDMED categories and PAQ-C levels. It is concluded that the noticeable percentage of children with low level of PA and unhealthy eating habits indicate the need for further education on healthy eating and regular PA in elementary school. Funding: This research was funded by EU4Health-2022-PJ-11 grant number 101128641 (DUSE—Counteracting Diabetes USing interdisciplinary Educative programs).

Keywords: Physical activity, Mediterranean diet, Children

PHYSICAL EDUCATION TEACHERS AND SUSTAINABILITY: A LITERATURE REVIEW

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Sustainable development (SD) has emerged as a major topic in modern education and connects directly to the realization of the Sustainable Development Goals (SDGs), focusing specifically on SDG 4 (Quality Education). Physical Education stands as a pedagogy in which sustainability-related values can develop through experiential active learning, providing the opportunities to engage with the overarching goals of inclusion, health, and environmental awareness. The aim of this research is to investigate physical education teachers' attitudes towards sustainable development while examining their understanding and teaching approaches in respect to sustainability. The research methodology used was literature review that included 25 articles selected on criteria of relevance and publication date between 2010-2025, in the academic databases Scopus and Google Scholar, using as main keywords "education for sustainability" and "physical education and sustainability". The findings reveal that teachers think of sustainability mainly in environmental terms, only with weak understanding of its social and economic aspects. Physical education teachers exhibit sustainability-aligned behaviors, but these are not applied within their actual teaching practice. The application in teaching is limited and disjointed in practice, often centering on narrow themes (e.g. inclusion, outdoor education, sustainable lifestyles). Physical education teachers seldom take a proactive interest in sustainability activities even when they recognize their significance. Physical education is more associated with health and less with sustainable, broad-based elements. These practices result from various individual and situational influences, such as environmental consciousness, school support, policy frameworks as well as professional development, all of which impact these practices. Meanwhile, obstacles such as lack of training, absence of time and resources, insufficient guidance, and low confidence are some of the barriers to successful adopting that can be seen as a hindrance to the actual implementation. To conclude, physical education has great potential to address the integration of sustainability competencies and responsible citizenship. There is, however, a clear, stark divide between knowledge and practice according to the findings, there is a requirement for targeted teacher training, supportive education contexts and the provision of appropriate tools to support and monitor integration of sustainability into physical education teaching in an evidence-based environment.

Keywords: Physical Education, Sustainability, Education for Sustainable Development

POSITIVE EDUCATION AS A PREVENTIVE FRAMEWORK FOR AGGRESSION IN SCHOOL: BASELINE RESULTS FROM A MIXED-METHODS STUDY

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Aggressive behavior and various forms of school bullying represent a persistent challenge in contemporary educational environments, affecting students' well-being, academic engagement, and social development. Traditional disciplinary approaches based primarily on control and punishment often fail to produce sustainable behavioral change. In contrast, positive education offers a preventive framework grounded in empathy, respect, emotional regulation, and supportive teacher–student relationships. The present study aims to explore baseline levels of aggression, self-regulation, and perceived school climate as a foundation for implementing a structured positive education program. The research adopts a mixed-methods design within a quasi-experimental framework. The first phase (P1) includes quantitative data collected through a self-report questionnaire administered to 8th-grade students, assessing three main dimensions: (1) self-reported aggressive behavior, (2) experienced and observed aggression, and (3) reactions to aggressive situations and perceptions of school climate. The instrument uses a Likert-type scale and captures multiple forms of aggression, including verbal, physical, relational, and cyber aggression. In parallel, qualitative data were collected through structured interview-based questionnaires with students from grades 1–4, adapted to their developmental level. These instruments examine early manifestations of aggressive behavior, emotional responses, peer interactions, and self-regulation skills using simplified scales and visual response formats. Preliminary findings indicate the prevalence of verbal aggression, social exclusion, and emerging cyber-aggressive behaviors among adolescents, accompanied by difficulties in emotional self-regulation. Younger students demonstrate early patterns of reactive behavior, limited coping strategies, and a strong dependence on adult mediation. Across both groups, perceptions of school climate vary, with indications of inconsistent responses to aggression and the need for more supportive and preventive approaches. The results from this baseline phase provide an empirical basis for designing and implementing a structured positive education intervention to reduce aggression, strengthen self-regulation, and foster a positive and inclusive school climate.

Keywords: school climate, self-regulation, pupils, physical education

PROGRAMS FOR ENHANCING RESILIENCE THROUGH PHYSICAL EDUCATION

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The purpose of this paper is to present the findings of the literature review to date concerning interventions conducted in Greece and internationally aimed at strengthening the of primary and secondary school students within the context of physical education. The research evidence indicates that such interventions remain limited in number; however, those implemented have reported positive effects on the targeted competencies. Comparable initiatives appear to positively influence students' stress levels, resilience, problem-solving abilities, and other life skills. In the Greek context, research evidence is considerably scarcer; this, coupled with the favorable outcomes observed in existing interventions, highlights the need to implement analogous programs across all levels of education. This presentation will describe programs carried out in various schools in Greece and abroad, examine their results, and discuss the limitations encountered as well as implications for future action.

Keywords: physical education, resilience, intervention

QUESTIONING THE QUESTION

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A question is defined as any sentence that has an interrogative form or function and constitutes a key tool for students' development in environments where movement predominates. The aim of the present study was to record the views of undergraduate Physical Education Teachers (PETs) regarding their experience in using questions during their practicum in schools, and to investigate the relationship between their views and the characteristics of the questions they posed, as observed during their teaching. The sample consisted of 15 undergraduate students from the Department of Physical Education and Sport Science of DUTH, who participated in the course "Teaching Practicum in Primary and Secondary Education". They were selected from a larger research sample in which participants' questions were recorded during two teaching sessions, one at each educational level. This sample was divided into three groups based on the number of questions asked (few, several, many). Subsequently, five participants from each group were randomly selected to take part in individual semi-structured interviews after the practicum, which were analyzed qualitatively through thematic categorization. At the same time, the questions posed during teaching were analyzed quantitatively in terms of their purpose, cognitive level, and educational level. Descriptive statistics, contingency tables, and chi-square tests were used for the quantitative analysis. The findings showed that participants, regardless of group, mainly asked questions aimed at knowledge acquisition and classroom organization, with limited emphasis on students' emotions and behavior, while low-level cognitive questions predominated. Anxiety, lack of experience, and gaps in subject matter and pedagogical knowledge appeared to be the main barriers to using questions as a tool for developing thinking. These factors also seemed to differentiate participants' preferences across educational levels. Therefore, targeted preparation and systematic guidance of undergraduate PETs in the use of appropriate questioning techniques are considered necessary to promote the holistic development of students.

Keywords: Questioning,Physical Education,Undergraduate Physical Education Teachers

RECORDING OF CHARACTERISTICS AND OPINIONS OF THE PARTICIPATING EDUCATORS IN THE EDUCATING PROGRAM "OLYMPIC VALUES EDUCATION PROGRAM" FROM THE INTERNATIONAL OLYMPIC COMMITTEE

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The Hellenic Olympic Committee, the National Olympic Academy of Greece, and the Regional Department of Primary and Secondary Education of Eastern Macedonia and Thrace, with the support of the Olympic Solidarity program, co-organized a training seminar aimed at familiarizing educators with the International Olympic Committee's "Olympic Values Education Program" (OVEP) manual. The manual had recently been translated and made available for educational use. The initiative aimed to train thirty educators from different educational levels and subject areas so they could later act as multipliers of the knowledge and practices they acquired. The available positions were equally distributed between primary and secondary education. This study aimed to record the characteristics of the participating educators, including their subject area, gender, and age group, as well as the characteristics of their schools, such as whether they were located in rural areas or prefectural capitals and whether they were large or small institutions. In addition, the research examined the motivations that led educators to participate in the program and their potential role in promoting Olympic Education in Greece, including the dissemination of Olympic values and efforts to combat doping and violence in sports. Data were collected through a questionnaire created with Google Forms, which was sent electronically to those who had applied to participate. A printed version was also distributed to all participants at the end of the training. The responses were analyzed using descriptive statistics through SPSS software. The results show that educators were mainly motivated by the desire for professional development and access to new knowledge and innovative educational practices. Furthermore, participants recognized the values and ideals of Olympism, as well as the skills promoted by the program, as important educational tools that should be transmitted to students. Despite the relatively high average age of participants, the findings indicate a strong need for continuous professional development. The extension of working life appears to increase the demand for lifelong learning, specialized training, and the exchange of knowledge and experiences among educators.

Keywords: Olympic Values, Hellenic Olympic Committee, National Olympic Academy of Greece, Primary and Secondary Education

RELIABILITY OF THE KIDMED 2.0 QUESTIONNAIRE IN GREEK ELEMENTARY SCHOOL CHILDREN

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The Mediterranean diet is an established model of healthy eating with well-documented benefits for public health, highlighting the need for validated tools to assess adherence to it. The aim of this study, conducted within the framework of the European program "Counteracting Diabetes Using Interdisciplinary Educative Programs – DUSE", was to examine the test–retest reliability of the updated version of the KIDMED 2.0 Questionnaire (López – Gajardo et al., 2022) in a Greek school population aged 9–13 years. The questionnaire assesses adherence to the Mediterranean diet through 16 items, of which 12 are positively and 4 are negatively framed. Following forward–backward translation and evaluation of content comprehension by children in this age group, it was administered to 236 students in the 5th and 6th grades of elementary schools in Eastern Macedonia and Thrace, Greece. A subsample of 67 students completed the questionnaire again two weeks later to assess test–retest reliability using the Intraclass Correlation Coefficient (ICC) and weighted Cohen's kappa. The ICC value for the total score was 0.939 (95% confidence interval: 0.903 – 0.962; $p < 0.001$), indicating very high stability between the two measurements. Item-level reliability was assessed using Cohen's kappa (κ) coefficient, with values ranging from 0.385 to 1.000, reflecting moderate to excellent agreement between the two measurements. Specifically, most items demonstrated high to very high agreement, with κ values exceeding 0.60, while only two items showed lower agreement (κ = 0.385 and 0.489). The mean weighted Cohen's kappa for the overall instrument was 0.824, indicating very high reproducibility. Additionally, 81.25% of the items showed κ values above 0.70, suggesting good to very good agreement between the two measurements. These findings demonstrate very high to excellent test–retest reliability of the KIDMED 2.0, with high weighted kappa values across most items, supporting its use as a reliable tool for assessing adherence to the Mediterranean diet among elementary school students. Funding: This research was funded by EU4Health-2022-PJ-11 grant number 101128641 (DUSE—Counteracting Diabetes USing interdisciplinary Educative programs).

Keywords: Mediterranean diet, EU4Health, Cohen's kappa

ROMA AND INTERCULTURAL EDUCATION: THE ROLE OF PHYSICAL EDUCATION

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Addressing diversity and promoting inclusion are central challenges for contemporary education, a reality that becomes particularly evident in Physical Education, where cooperation, social interaction, and active participation constitute fundamental elements of the learning process. Although the education of Roma students is often situated within the broader framework of intercultural education, this general approach does not fully respond to the specific social and educational needs of Roma communities. The aim of the present study was to clarify the relationship between these two concepts and to examine how they intersect within the context of Physical Education. To this end, a review of Greek and international literature was conducted on intercultural education, Roma education, and their participation in Physical Education. Contemporary studies suggest that intercultural education is frequently implemented at a superficial level, without adequately addressing the deeper social inequalities experienced by specific groups of students. In contrast, Roma students often face systemic exclusion, persistent stereotypes, and limited access to educational opportunities, conditions that require targeted pedagogical interventions rather than general intercultural practices. These challenges become particularly visible in Physical Education, where participation in team activities, adherence to rules, and cooperative learning may be hindered by previous experiences of marginalization or by limited familiarity with organized physical activities. Research indicates that intercultural Physical Education programs can significantly enhance children's social skills, such as cooperation, respect, and communication, often to a greater extent than conventional Physical Education programs. These findings highlight the potential of Physical Education, when designed with an intercultural orientation, to function as a powerful mechanism for social inclusion and the acceptance of diversity. Overall, clarifying the relationship between intercultural education and Roma education is essential for the development of effective and inclusive practices in Physical Education, as a targeted pedagogical approach can substantially strengthen participation, social interaction, and the integration of Roma students within the school environment.

Keywords: Intercultural education, Roma education, Physical Education

THE EFFECT OF EDUCATIONAL LEVEL ON SELF-EFFICACY FOR TEACHING PHYSICAL EDUCATION: A COMPARISON OF EARLY CHILDHOOD AND PRIMARY EDUCATION TEACHERS IN CYPRUS

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The purpose of the present study was to examine the effect of educational level on teachers' self-efficacy perceptions regarding the teaching of Physical Education. The sample consisted of 73 in-service primary education teachers and 56 in-service early childhood education teachers from Cyprus. Teachers' perceptions of their teaching effectiveness were assessed using the Self-Evaluation of Teacher Effectiveness in Physical Education (SETEQ-PE) questionnaire. The instrument includes 25 items forming six dimensions of effective teaching: content application, lesson implementation, learning environment, instructional strategies, student and teaching assessment, and use of technology. The present study investigated differences in self-efficacy perceptions between primary and early childhood education teachers across all dimensions of teaching effectiveness, as measured by the SETEQ-PE scale. Internal consistency reliability was assessed using Cronbach's alpha and was found to be satisfactory for all subscales. A non-parametric Kruskal–Wallis test was conducted to examine differences between the two groups. The results indicated that early childhood education teachers reported higher levels of perceived effectiveness compared to primary education teachers in the learning environment dimension, particularly in aspects related to individualized instruction supporting students' motor and cognitive development, the enhancement of their social and emotional development, and the provision of a safe learning environment. No statistically significant differences were found between the two groups in the dimensions of content application, lesson implementation, instructional strategies, assessment, and use of technology. In conclusion, the findings suggest that although primary and early childhood education teachers demonstrate similar levels of perceived self-efficacy across most dimensions, they differ in the learning environment dimension, providing useful insights for improving the management of the learning environment in Physical Education teaching.

Keywords: Physical Education, self-efficacy, effective teaching, early childhood education, primary education

THE IMPORTANCE OF USING STRUCTURED MOTOR PROGRAMS IN THE DEVELOPMENT OF PRESCHOOL-AGED CHILDREN

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Physical activity and structured motor programs from preschool age influence brain development and produce positive outcomes, in cognitive and social development and help prevent potential dysfunctions that appear during early childhood. Organized motor activities from the early developmental stages affect neurotransmitter activity, toddlers' behavior, and overall brain development. The purpose of this study was to examine the contribution of structured motor programs for preschool children in order to highlight their importance in the development of cognitive and behavioral skills. The methodology of the present study was a literature review, and the search was conducted in valid and scientifically recognized databases, such as "google scholar", "ERIC" and "PubMed", covering the period 2020–2025. From this search, 17 sources were identified, which demonstrate through research, the benefits of Physical Education in preschool age in relation to the issue under investigation. On these, 12 had control groups and 5 were literature reviews. The studies mainly concerned structured motor programs implemented as school-based intervention programs for a specific period of time with preschool children. The intervention periods ranged from 15 days to 6 months. The results indicated that the intervention groups showed improvement at cognitive, motor, emotional, behavioral, and even moral levels compared to the control groups. Therefore, the importance of integrating structured motor programs into preschool educational settings is highlighted. Since, it has been demonstrated that intervention programs involving Physical Activity and Movement also contribute to the child's typical developmental progress, the new preschool curriculum published in 2023 already include physical literacy and its development. However, further research is needed on specific motor activities.

Keywords:
PhysicalActivity,PreschoolAge,PhysicalEducation,SportScience,NeuropsychologicalMaturation

THE ROLE OF TRADITIONAL DANCE IN PHYSICAL EDUCATION AS A MEANS OF FOSTERING CULTURAL KNOWLEDGE AND POSITIVE ATTITUDES AMONG STUDENTS

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Nowadays, globalization often limits the engagement of young people with their local cultural heritage. In Greece students without the correct guidance might become alienated from tradition and local customs, leading to a gradual erosion of cultural identity. This study examined the role Greek traditional dance lessons play within the context of Physical Education in enhancing students' cultural knowledge and their overall attitude toward Greek tradition. The sample consisted of sixty-seven private school students ranging in age from nine to seventeen years old with varying levels of experience in traditional dance, stretching from three months to five years. To assess their progress and perceptions, participants completed a purpose-built 3-item questionnaire, designed specifically to assess the study's variables on a 5-point Likert scale. The questionnaire was administered once to the participants and was checked for content and face validity by experts in the field of Physical Education. The quantitative data analysis yielded compelling results, revealing high mean scores for both cultural knowledge (M=4.25) and positive attitudes toward tradition (M=4.69). These statistics indicate that consistent participation in structured traditional dance lessons significantly enhanced students' understanding and appreciation of Greek heritage. Furthermore, findings suggest that traditional dance acts as a powerful experiential tool for fostering cultural identity within the physical education curriculum. By practicing dancing students are moving beyond the theoretical learning and are encouraged to embody their cultural history. Consequently, integrating such lessons in the schools yearly curriculum planning is highly recommended for educators and policymakers seeking to promote cultural literacy and preserve traditional values in an increasingly globalized educational landscape.

Keywords: Traditional dance, Physical education, Cultural identity, Student attitudes, Private school

WHEN THE FAIRY TALE MOVES: BODY, IMAGINATION, AND LEARNING IN EARLY CHILDHOOD

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When the Fairy Tale Moves: Body, Imagination, and Learning in Early Childhood Papanikolaou Xanthippi, Kouli Olga Fairy tales constitute one of the most important pedagogical tools in early childhood education, contributing to the holistic development of the child by enhancing imagination, language expression, and emotional intelligence. At the same time, movement is a fundamental factor in learning and development, supporting children's physical, cognitive, and socio-emotional growth from the earliest years of life. This paper explores the combination of storytelling and movement as an integrated pedagogical approach, where the body, language, and imagination function complementarily. Through dramatization and physical representation of stories, children actively engage in the learning process, enhancing comprehension, expressiveness, and collaboration. Within the framework of the study, an initial mapping of Greek and international literature on "movement-based fairy tales" was conducted. The findings indicate that for ages 1–4, existing literature mainly focuses on simple, guided movements, while for children over 3 years old, there is a greater variety of activities involving the whole body, imitation, and interactive elements. However, there is limited development of interactive fairy tales that meaningfully incorporate movement and active child participation. This finding highlights the need for further research and the development of educational materials that promote experiential learning, creativity, and the overall engagement of children in the educational process.

Keywords: FAIRY TALE,MOVES,EARLY CHILDHOOD

ΣΥΝΤΑΓΟΓΡΑΦΗΣΗ ΤΗΣ ΑΣΚΗΣΗΣ

PRESCRIPTION OF EXERCISE

EFFECT OF INDIVIDUALIZED HOME-BASED EXERCISE ON PHYSICAL FITNESS AND FUNCTIONAL CAPACITY IN A PERSON WITH PARKINSON'S DISEASE: A CASE STUDY

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Systematic and structured exercise in Parkinson's disease has been shown to enhance balance, mobility, flexibility, and overall functional capacity, while simultaneously reducing fatigue, pain, and fear of falling. However, participation in structured exercise programs is often limited due to motor impairments and reduced functional ability, as well as external factors such as the COVID-19 pandemic. Home-based exercise has been proposed as an alternative; nevertheless, studies specifically examining fully supervised exercise interventions conducted at home remain scarce. The aim of the present case study was to investigate the effects of an individualized, supervised, home-based exercise protocol, implemented during the "on" phase of pharmacological treatment, over a period of 8 weeks, in an 80-year-old patient with stage 2 Parkinson's disease, according to the Hoehn and Yahr scale, and comorbidities including type 2 diabetes mellitus and coronary artery disease. The intervention consisted of balance, strengthening, and flexibility exercises, performed twice weekly, with each session lasting 60 minutes. Assessment was conducted pre- and post-intervention using multiple validated instruments: the Senior Fitness Test (SFT) for overall physical fitness, the Berg Balance Scale for balance performance, the Modified Falls Efficacy Scale (mFES) for fear of falling, the Fatigue Severity Scale (FSS) for fatigue, and the KPPQ-Pain for pain assessment. The findings demonstrated that, following the intervention, overall physical fitness improved by 22.7%, with the greatest improvement observed in upper limb strength (43.75%) and the smallest in endurance (8.57%). Additionally, balance performance improved by 10.42%, fear of falling decreased by 2.24%, fatigue was reduced by 25%, and pain was eliminated. In conclusion, the results suggest that an individualized and supervised home-based exercise program may constitute a safe and effective intervention for enhancing physical fitness, balance, and functional capacity in patients with Parkinson's disease, even in advanced age and in the presence of comorbidities. Furthermore, such interventions may contribute to reductions in fatigue, fear of falling, and pain, thereby improving overall quality of life. However, further research with larger sample sizes is required to confirm these findings and support their generalizability.

Keywords: Parkinson's disease, home-based exercise, health, quality of life

ΙΣΤΟΡΙΑ ΤΟΥ ΑΘΛΗΤΙΣΜΟΥ - ΚΟΙΝΩΝΙΟΛΟΓΙΑ

SPORTS HISTORY/SOCIOLOGY

'AIEN ARISTEUEIN' FROM THE ATHLETIC TO THE ACADEMIC ARENA AS A PATH OR A POINT OF STAGNATION

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The pursuit of excellence, as reflected in the ideal "Aien aristeuein," has consistently maintained its significance in the field of sport, where high-level distinction constitutes an expression of long-term and systematic striving beyond limits. During the period 2012–2019, Greek sport records significant international achievements, including Olympic medals and distinctions in World and European Championships, confirming the sustained pursuit of participation in high-level competitions. The legislative intent for the period 2013–2019 is shaped through successive regulatory interventions (Laws 4115/2013-4603/2019), which both expand and further specify the conditions of access of distinguished athletes to higher education. Through these provisions, an attempt is made to link athletic distinction with academic progression, while preserving established academic evaluation criteria. Within this framework, the aim of the present study was to investigate the possible association between legislative developments and the academic progression of students admitted as athletes to the School of Physical Education and Sport Science (Athens) during the period 2013–2019. The study is based on primary quantitative data concerning the total number of enrolled students admitted as athletes and includes the recording of academic progression in terms of completion within four years, beyond four and up to eight years, beyond eight years, and the proportion of students remaining in pending graduation status. The findings indicate that completion within the nominal duration is extremely limited; the majority of students complete their studies within a period of five to eight years (42.81%). Completion beyond eight years is recorded as marginal, whereas a high proportion of students remain in a pending graduation status (49.24%). The results suggest that, despite the expanded and institutionally regulated access, academic progression is not characterised by corresponding timely completion. The link between athletic distinction and university studies appears to be reflected primarily at the level of admission, while being less evident in academic outcomes; this pattern highlights a trajectory that calls for targeted support for effective utilisation of institutional privileges and to prevent academic stagnation.

Keywords: History of Sport,Athletic Excellence,Dual Career,Higher Education, Legislative Development

A SOCIOLOGICAL READING OF THE DISPUTE BETWEEN CLASSICAL AND CONTEMPORARY PILATES

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This paper examines the dispute between Classical and Contemporary Pilates not as a merely technical divergence in exercise instruction, but as a sociologically charged field of conflict structured around authenticity, professional legitimacy, recognition, and symbolic power. Its central argument is that Pilates functions not only as an exercise method, but also as a professional and cultural field in which different actors seek to define what counts as "valid" and "correct" Pilates. The analysis is organized around four main axes, drawing on Foucauldian approaches to regimes of truth and Bourdieusian concepts of field, capital, and struggles over legitimacy. First, it traces the historical transition from Joseph Pilates' method to a polyphonic field of apprenticeship, in which authenticity becomes a form of social and professional capital. Second, it examines the legal and institutional dimension of the dispute as a pivotal moment in the struggle over definitional power and the legitimacy of the method. Third, it analyzes the Classical–Contemporary distinction as a confrontation between different regimes of legitimacy: one deriving prestige from tradition, genealogy, and fidelity to the method, and the other from scientific credibility, individualization, and adaptability. Fourth, it draws on the concepts of identity, alterity (otherness), recognition, and misrecognition to examine how Classical and Contemporary Pilates are constituted as distinct professional subcultures, with specific vocabularies, criteria of prestige, aesthetics, instructor models, and legitimating narratives. The paper also highlights the role of equipment companies and branding in shaping professional identity and symbolic distinction, as they promote not only products but also competing images of legitimacy within the field. Particular attention is given to pedagogical and professional responsibility, since the dispute concerns also which modes of teaching are understood as professionally and ethically responsible. At a broader level, the dispute may also be read as an expression of changing forms of bodily regulation and self-regulation in modernity. The paper concludes that the Classical–Contemporary opposition is not merely a conflict between schools, but a process of reconfiguration within a living field, in which difference may function either as productive dialogue or as a mechanism of hierarchy and exclusion.

Keywords: PILATES,CLASSICAL PILATES,CONTEMPORARY PILATES,SYMBOLIC POWER,PROFESSIONAL LEGITIMACY,OTHERNESS,PROFESSIONAL SUBCULTURES

ADMITTED AND GRADUATED STUDENTS – ELITE ATHLETES AT THE DEPARTMENT OF PHYSICAL EDUCATION AND SPORT SCIENCE OF KOMOTINI TO DATE

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The aim of the present study is to examine the relationship between athletic excellence and access to higher education, using the case of the Department of Physical Education and Sport Science in Komotini, in relation to its longitudinal development and the evident imbalance between the number of admitted students and that of student-athletes who ultimately complete their studies.The concept of excellence is approached from a historical perspective, tracing its origins from the ancient Greek notion of aretē, where it was associated with the holistic cultivation of the individual, to its contemporary interpretation as measurable athletic performance and institutional recognition. Within the Greek context, the state has developed an evolving legislative framework that facilitates the admission of distinguished athletes into tertiary education, acknowledging the particular demands of an athletic career.The analysis of quantitative data from the Department of Physical Education and Sport Science in Komotini (1984–2020) reveals significant discrepancies between the number of admitted students and that of graduates. More specifically, it is observed that increased access through institutional provisions is not accompanied by correspondingly high rates of timely graduation. The majority of student-athletes complete their studies beyond the standard duration, a phenomenon attributed both to the demanding nature of dual careers and to broader socio-economic and institutional factors.In conclusion, while athletic excellence functions as a mechanism for expanding access to higher education, it does not, in itself, ensure academic success. The findings underscore the need for comprehensive support policies for student-athletes, aiming to achieve a balance between athletic and academic commitments and thereby substantially enhancing the sustainability of dual career pathways.

Keywords: athletic excellence, higher education, dual career, institutional framework, academic success.

CATHCBALL IN THE REGION OF EASTERN MACEDONIA AND THRACE

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Catchball is a contemporary team sport that has experienced substantial international growth in recent decades, particularly within women's sport. Originating in Israel in '90s, as an alternative form of volleyball, it was designed to be accessible to adult women without prior athletic experience. Its key innovation—requiring the ball to be caught and thrown rather than struck—reduces technical demands and minimizes injury risk, thereby facilitating broader participation across diverse social and cultural contexts. During the 2000s and 2010s, Catchball expanded globally, primarily through informal groups and local clubs. A major milestone in its institutional development was the establishment of the International Catchball Federation (ICF) in 2016, which contributed to the standardization of rules, the organization of international competitions, and the formation of a unified framework for sport's development. The present study aims to systematically investigate the emergence and development of Catchball as both a sporting and social phenomenon in the Region of Eastern Macedonia and Thrace, where it was first introduced in Greece in 2022. This research addresses a notable gap in both international and national literature. Data was collected through a combination of literature review, online research, and semi-structured interviews with team representatives. Although Catchball in Greece remains at an early stage and lacks official institutional recognition—either through an official federation or integration into the national sports system—it demonstrates rapid growth and considerable potential. This is reflected in the establishment of eleven women's amateur sports clubs within the region, their participation in municipal sports programs, as well as in national and international tournaments, and the organization of an unofficial league (2025–2026 season). The results indicate that Catchball extends beyond a purely athletic activity, functioning as a social and cultural phenomenon that promotes women's empowerment, social inclusion, and lifelong engagement in physical activity. These results provide a foundation for further research into women's participation in sport.

Keywords: sports system, cultural phenomenon, alternative form of volleyball, International Catchball Federation

CONSTRUCTING THE "ANTI-NATIONAL" UNION OF GREEK ATHLETES: THE DISCOURSE OF THE HELLENIC OLYMPIC COMMITTEE IN A REPORT FROM THE CIVIL WAR PERIOD

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The present study examines the Civil War discourse of the Hellenic Olympic Committee (HOC) regarding the Union of Greek Athletes (UGA), as reflected in a report drafted by the head of the Greek Olympic delegation for the 1948 London Olympics. The research demonstrates that, through the discourse of the HOC, an attempt was made to attribute anti-national activity to the UGA, while silencing or downplaying the actual state of affairs, according to which the UGA functioned as a social and economic supporter under the conditions of the Occupation. The rhetoric of the HOC includes accusations concerning the ideological orientation of the UGA, which, according to the HOC, served as a cover for its true intentions, namely the "initiation" of athletes into leftist ideology. Through this document, the HOC does not provide a neutral assessment of the UGA's activity during the Occupation, rather, it articulates an ideologically charged discourse. The historical context in which this discourse is articulated is not incidental, but may have significantly influenced it. The Civil War context, during which the dominant governmental discourse equated the Left with the notion of the "anti-national," is by no means negligible, but permeates institutional discourse, including that of the HOC. The study employs a qualitative discourse analysis methodology in order to interpret the conceptual frameworks that emerge from the report. At the same time, the analysis is contextualized through an examination of the social and ideological composition of the administrations of the two bodies, in order to demonstrate that the differences in their discourse were not merely circumstantial, but were grounded in deeper ideological perceptions.

Keywords: Civil War–era sports discourse, Union of Greek Athletes, Hellenic Olympic Committee, Greek Civil War

ION IOANNIDIS: THE LEADING FIGURE OF REFORM AND MODERNIZER IN PHYSICAL EDUCATION

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The study examines the structural changes proposed by Ionas Ioannidis to modernize Physical Education and Sports in Greece at all levels of education (elementary school, middle school, and university). At the same time, it presents his professional and academic career, with 1964 serving as the starting point, when the Pedagogical Institute was founded, where he was the first to serve as an appointed Advisor on Physical Education, and later at the Center for Educational Studies and Training (K.E.M.E.). Ionas Ioannidis is considered a leading figure in the reform efforts in Physical Education, and his contribution to this field is regarded as significant because: a) he contributed to changing the Physical Education system, as he sought to separate Greek Physical Education from Swedish gymnastics and orient it toward competitive sports (athletics, swimming, and classical athletics), b) proposed the establishment of an individual student athletic record, an athletic badge, a badge of athletic conduct, as well as the operation of a student athletic association, c) contributed to the improvement of Physical Education Teachers' training, placing great emphasis on their professional development by personally organizing numerous seminars, d) played a decisive role in elevating the National Academy of Physical Education (E.A.S.A.) to university status, e) contributed to the development of the new Physical Education curricula, and finally f) played a major role in abolishing gymnastic demonstrations, which created problems for school operations, and in replacing them with competitive sports festivals, which would be organized by the students themselves under the supervision of Physical Education Teachers. In summary, Ionas Ioannidis is considered one of the most important figures in the history of Physical Education in Greece and is often described as the "modernizer of Physical Education," as his contribution to the reform and, by extension, the improvement of the subject, within the Greek educational system, was deemed fundamental.

Keywords: reform, Physical Education, Physical Education Counselor, seminars

SPORTS AND GAMES INVOLVING JUMPING IN THE MOTOR (PHYSICAL) TRADITION OF CYPRUS AND MODERN SPORTS AND ATHLETIC ACTIVITIES

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The aim of the study is to correlate traditional motor games and sports involving jumping in Cyprus with modern sports and athletic activities. Based on a review of the literature (1874–2025) and 200 interviews with individuals born in Cyprus during the period 1910–1969, data were recorded relating to 560 traditional games and sports of Cyprus. The analysis of the bibliographic sources and the transcribed interviews showed that, out of the total of 560 traditional sports and games, 22 games and sports involving jumping were identified. The results of the research indicate that traditional motor games and sports involving jumping in Cyprus are correlated with modern sports and athletic activities to a limited extent. A more systematic study of the traditional games and sports of Cyprus—using data from all communities (Greek Cypriots, Turkish Cypriots, Maronites, Armenians, Latins), as well as traditional games from the wider Greek world and other nations—would provide a clearer picture of traditional motor games and sports involving jumping and their relationship with ancient Greek games and modern sports and athletic activities.

Keywords: almata, laika athlimata, Jumps, Traditional sports, Cyprus

THE GREEK SWIMMING CHAMPIONSHIPS IN THE 1920S THROUGH THE SPORTS PRESS.

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The subject of this work examines the organization of Greek Swimming Championships during the 1920s through reports published in the sports press. Swimming, as a sporting activity, was presented in Greece at the end of the 19th century, without being established as a main sport of Greek society, in relation to classical sports like cycling and wrestling. The aim of this research is to investigate the organization of the first national competitions and to highlight the role of the sports press in the development of the sport. The study is based on sports periodicals of the decade 1920 (Η Νίκη, Αθλητική Επιθεώρηση, Αθλητικός Κόσμος, Αθλητισμός , Αθλητική Εβδομάς, Αθλητική), which were analyzed using a qualitative historical approach. Through these publications, the conditions under which the competitions were held, the organizational structure of the events, and the promotion of swimming to the sporting public are examined. Particular emphasis is placed on the transition from the organization of championships by SEGAS to the establishment of an autonomous swimming federation. The findings highlight the organizational challenges faced during the early competitions, including infrastructure limitations and administrative issues, while also demonstrating the important role of the sports press in legitimizing and promoting swimming as a competitive activity. Furthermore, the significance of the Greek Championships as a key mechanism for the development of competitive swimming in Greece during the 1920s is documented.

Keywords: Swimming, Greek Championship, decade 1920, Sports press, SEGAS, EKOF.

THE POSITION OF WOMEN IN TRACK AND FIELD AND SPORT IN GREECE: A LITERATURE REVIEW(2005–2025)

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The position of women in sport has been a central issue in contemporary sport science, as gender inequalities continue to shape participation, representation, and opportunities. The purpose of the present study was to examine the position of women in track and field and in sport in Greece through a literature review, focusing on participation trends, sociocultural influences, and structural inequalities. Relevant literature published between 2005 and 2025 was collected from international and Greek databases using keywords such as “women in sport Greece”, “gender equality”, and “female athletes”. The findings indicate that although women’s participation in sport and especially in athletics has increased significantly over the past decades, important inequalities still persist. Sociocultural factors, including gender stereotypes and traditional perceptions of femininity, continue to influence women’s involvement in sport. In addition, structural barriers such as limited access to resources, underrepresentation in leadership and coaching positions, and reduced media visibility further reinforce gender disparities. Evidence also suggests that female athletes often face challenges related to recognition, support, and long-term engagement, particularly during adolescence. Despite policy initiatives at national and European levels aiming to promote gender equality in sport, their implementation remains uneven. In the context of Greek athletics, women have achieved notable international success; however, this success is not always reflected in equal opportunities or representation within sport organizations. Overall, the literature highlights that progress has been made, but gender equality in sport has not yet been fully achieved. It is therefore necessary to strengthen policies, promote inclusive practices, and challenge persistent stereotypes in order to ensure equal opportunities for women in track and field and sport in Greece.

Keywords: women in sport, gender equality, athletics, Greece, female athletes

UNION OF GYMNASTS (1924–1945): SCIENTIFIC ACTIVITIES, DISCOURSE, AND PERCEPTIONS

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The Union of Gymnasts emerges in 1924 within a harsh historical context, shaped by intense political and social instability. This instability follows the recent National Schism of 1915 and leads to the Asia Minor Catastrophe of 1922. Throughout its course, the Union encounters two dictatorships, that of Pangalos in 1925 and that of Metaxas in 1936. It also experiences both the abolition of the monarchy in 1924 and its restoration in 1935. At the same time, it interacts with a similar professional aggregation of gymnasts, the Society for Gymnastic Studies (1933–1936), and later receives another, the Gymnastic Society (1946–1947). Moreover, it lives through World War II between 1940 and 1944, and subsequently faces the new divisions that emerge after the liberation of Greece in 1945, at which point its traces disappear. This study aims to highlight the activities, discourse, and perceptions of the Union of Gymnasts within the spatial and temporal framework in which it operates. The historical context of its activity reveals a mosaic of political and social transformations characterized by intensity, frequency, and variability. This research aims to examine the Union's behaviour within this unstable environment. Its actions, discourse, and perceptions constitute the main fields of inquiry in this study. More specifically, the study examines how the Union interacts with broader developments, the extent to which it resists or accommodates them, the alliances it forms, the actors it criticizes, and the ways in which it evolves. This research aims to highlight the Union's anti-monarchical orientation, its stance during the period of the Venizelist "reformist project," its adoption of an inward-looking nationalism, within the framework of constructing a broader national narrative, on the path toward the formation of the bourgeois state and finally, the period from the restoration of the monarchy to liberation, during which new dilemmas shape a new era.

Keywords: Interwar, Union of Gymnasts, SEGAS, Chrysafis Ioannis, Olympic Games Committee

WOMEN'S PARTICIPATION IN THE OLYMPIC GAMES UNTIL THE INTERWAR PERIOD (1936)

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The participation of women in the Olympic Games from 1896 to 1936 constitutes a gradual yet pivotal process of social and athletic emancipation. During the first modern Olympic Games, held in Athens in 1896, women were entirely excluded, reflecting the dominant societal perceptions of the time regarding their role and position. Nevertheless, as early as the 1900 Paris Olympic Games, women made their initial appearance, competing in a limited number of "appropriate" sports, such as tennis and golf. In the following decades, their presence increased progressively, both in terms of participation rates and the diversity of sporting events. This period was marked by intense ideological and institutional contestation between proponents and opponents of women's participation, with prominent figures within the Olympic movement expressing reservations or even explicit opposition. Despite these obstacles, women actively asserted their right to participate, reaching a significant milestone with the introduction of women's track and field events at the 1928 Amsterdam Olympic Games. This development, however, was not linear, as it was accompanied by restrictions, including the removal of certain events due to purported concerns regarding female physiology. Nonetheless, by the time of the 1936 Berlin Olympic Games, women's participation had become firmly established as an integral component of the Olympic movement, reflecting broader social transformations and the advancement of the women's rights movement. The aim of this study is to highlight the trajectory of women's participation in the Olympic Games during the period 1896–1936, shedding light on the transition from total exclusion to gradual recognition, as well as the contribution of this evolution to the establishment of the foundations for women's equal presence in global sport.

Keywords: social perceptions, equality, sport inclusion, institutional constraints.

WORKERS' SPORTS IN THESSALONIKI DURING THE INTERWAR PERIOD (1922-1940)

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The workers' sports movement appears in the early 1920s as part of the labor front, indicating a new perception of sports, grafted with the ideals of solidarity, collectivism and socialism, far from the framework of competition and individualism. The purpose of the research was to collect and process data on workers' sports in Thessaloniki during the interwar period (1922-1939).The study highlighted research questions concerning the factors that led to the development of this form of sport, the initiators as well as the number of clubs and the action developed by its members. The Communist Party of Greece seems to have identified the possibility of developing intervention in the field with broad worker masses for the detachment of forces and then the of sport in a timely manner and, responding to the recommendations of the Red Athletic International, played a pioneering role in the dissemination and consolidation of workers' sport in Thessaloniki. A major contribution made the Federation of the Communist Youth of Greece, founded in 1922.The usefulness of sports seems to create two main directions of exploitation, initially the contact conflict of "two worlds", this time in the field of sports, between capitalism and socialism, which will take on global characteristics in the coming years. Some workers' football teams make their appearance in Thessaloniki from 1925 onwards with the main characteristic being the establishment of a team by the Workers' Center of Thessaloniki under the name "Ergatikos Astir". In the late 1920s, this form of organization seemed to gain new momentum due to the attraction that sports generated among the working classes, more specifically football, as well as the better orientation of action with the establishment of the Workers' and Peasants' Sports Federation. However, in the early 1930s, most of the city's labor unions seemed to cease their activities, either due to persecution based on the "idionymon" law or due to the difficult response to the operation of a team. The political and social contribution of Workers' Sports is identified as significant since it fulfills the above goals and directions.

Keywords: workers' sports , Thessaloniki, interwar period

ΑΘΛΗΤΙΚΕΣ ΚΑΚΩΣΕΙΣ ΚΑΙ ΑΠΟΚΑΤΑΣΤΑΣΗ

SPORTS INJURIES AND REHABILITATION

ASSOCIATION BETWEEN INJURY OCCURRENCE AND MATCH CHARACTERISTICS IN ITF TAEKWONDO DURING A WORLD CHAMPIONSHIP

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The purpose of the present study was to examine the relationship between injury occurrence and match characteristics among ITF Taekwondo athletes during a high-level international competition. The study included 147 male and female athletes who competed in the 2019 ITF Taekwondo World Championship held in Plovdiv, Bulgaria. Injury data were collected using a structured recording form completed by the competition physician and included information regarding match number, round of the match, match outcome, as well as whether the athlete withdrew from the match or required hospital care. Statistical analysis was performed using descriptive statistics and chi-square (χ^2) tests. The results showed that most injuries occurred during the first match of the day (50%) and during the first round of the match (54.3%). Furthermore, injuries were more frequently observed among athletes who lost their match (68.2%). However, the majority of injuries did not result in match withdrawal (83.5%) or hospital visits (85.9%). In conclusion, most injuries in ITF Taekwondo competitions occur during the early stages of matches and are generally of low severity, allowing most athletes to continue their participation in the competition.

Keywords: Taekwondo ITF, match characteristics, injury occurrence, competition analysis, injury severity

CONSERVATIVE REHABILITATION OF MEDIAL COLLATERAL LIGAMENT AND PATELLAR LIGAMENT INJURIES: A CASE STUDY

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Knee ligament injuries are common, particularly among athletes and active individuals. The aim of this study was to evaluate the effectiveness of a rehabilitation program following a first-degree (Grade I) injury of the medial collateral ligament (MCL) and the patellar ligament in a 40-year-old physically active male patient, who sustained the injury during work-related manual activity. The program lasted two weeks (eight sessions) and included progressively structured strengthening exercises, balance and proprioception training, and functional re-education, with supplementary use of a magnetic stimulator. Assessment was conducted using patient-reported pain questionnaires and functional tests, specifically the Chair Stand Test and the Timed Up and Go Test (TUG), before and after the intervention. The results showed a reduction in pain and improvement in functionality, as evidenced by an increase in repetitions on the Chair Stand Test and a decrease in completion time on the TUG, allowing the patient to return to daily activities without reporting pain or stiffness. This study highlights the importance of a structured and progressive rehabilitation program for a safe return to daily and athletic activities. Despite the study's limitations (n=1, short duration, lack of objective strength and range-of-motion measurements), conservative rehabilitation with progressive loading appears to be effective.

Keywords: rehabilitation, knee, medial collateral ligament, patellar ligament, functionality

DEMOGRAPHIC AND ANTHROPOMETRIC CHARACTERISTICS OF INJURIES IN ITF TAEKWONDO ATHLETES DURING A WORLD CHAMPIONSHIP

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The aim of the present study was to investigate the frequency of injuries in relation to the demographic and anthropometric characteristics of ITF Taekwondo athletes during high-level competition. The sample consisted of 147 male and female athletes who participated in the 2019 ITF Taekwondo World Championship held in Plovdiv, Bulgaria. Data were collected using a structured recording form completed by the competition physician during the event and included information regarding sex, age category, and weight category of the athletes. Statistical analysis was performed using the SPSS software package, applying descriptive statistics and chi-square (χ^2) tests. The results showed that the majority of injured athletes were male (73.5%), while females represented 26.5% of the sample. No statistically significant differences were observed between age categories, as injuries occurred at similar rates among senior and junior athletes. In contrast, a higher frequency of injuries was observed in the heavyweight categories (47.6%) compared to the middleweight and lightweight categories. In conclusion, the findings suggest that injuries in ITF Taekwondo occur more frequently among male athletes and in heavier weight categories, whereas age category does not appear to significantly influence injury occurrence.

Keywords: Taekwondo ITF, injuries, anthropometric characteristics, weight categories, athletes

EFFECTS OF A 12-WEEK STRENGTH AND HYPERTROPHY TRAINING PROGRAM ON KNEE MUSCLE FUNCTION FOLLOWING ACL RECONSTRUCTION: A CASE STUDY

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Anterior cruciate ligament (ACL) reconstruction is frequently associated with persistent neuromuscular deficits, particularly in quadriceps and hamstring strength, which may negatively affect functional performance and increase the risk of re-injury. Even one year post-surgery, inter-limb asymmetries and reduced muscle performance are commonly observed, highlighting the importance of targeted exercise interventions during the late rehabilitation phase. This case study aimed to examine the effects of a structured strength and hypertrophy training program on knee muscle function in a young female following ACL reconstruction. A 21-year-old female, one year after ACL reconstruction, participated in a 12-week intervention consisting of 12 supervised exercise sessions. The training program primarily focused on lower-limb hypertrophy and strength development, incorporating progressive overload principles and multi-joint resistance exercises. Muscle function was assessed before and after the intervention using an isokinetic dynamometer. Bilateral knee extensors and flexors were evaluated under concentric muscle actions (CON/CON) at angular velocities of 60°/s and 180°/s. Key outcome variables included peak torque, mean power, total work, and inter-limb asymmetries. The results demonstrated notable improvements in muscle performance in both limbs, with greater adaptations observed in the previously injured limb. Increases were evident in peak torque, mean power, and total work of both knee extensors and flexors at both angular velocities, indicating enhanced force production capacity. Additionally, inter-limb asymmetries were reduced across most variables, particularly at 60°/s, suggesting a more balanced neuromuscular profile following the intervention and improved functional symmetry. In conclusion, a structured strength and hypertrophy training program may effectively improve knee muscle function and reduce asymmetries in individuals following ACL reconstruction, even at a late stage of rehabilitation. This highlights the importance of continued strength-oriented interventions beyond the early rehabilitation phases and their potential role in optimizing return-to-activity outcomes.

Keywords: ACL reconstruction, isokinetic dynamometry, strength training, hypertrophy, knee muscle function, inter-limb asymmetry, rehabilitation

FUNCTIONAL REHABILITATION AND RETURN-TO-SPORT FOR A VOLLEYBALL ATHLETE WITH GREATER TUBEROSITY BONE MARROW EDEMA AND PARTIAL SUPRASPINATUS TEAR: A CASE STUDY

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Bone marrow edema of the greater tuberosity combined with partial supraspinatus tears represents a complex clinical challenge in overhead athletes, particularly when anatomical factors like a narrow subacromial space are present. The purpose of this case study was to investigate the effectiveness of an 8-week structured functional rehabilitation program aimed at the full return to competitive volleyball activity. The participant was an elite female volleyball athlete presenting with significant shoulder pain and functional deficits due to diagnosed bone marrow edema of the greater tuberosity, a partial supraspinatus tear, and an underlying narrow subacromial space. The clinical management followed a multi-modal approach, incorporating physical therapy sessions in accordance with the supervising physician's guidelines to address the bone marrow edema. The exercise intervention was organized into four progressive phases: pain control and scapular activation, rotator cuff strengthening, advanced strengthening, and sport-specific integration. A critical parameter of the design was the deliberate avoidance of overhead exercises and positions during the initial and intermediate stages, to prevent impingement and facilitate tissue healing. Evaluation was performed at four weeks, and at eight weeks, utilizing the Visual Analogue Scale (VAS) for pain and a Chronojump dynamometer for isometric strength testing in abduction, external rotation, and the Athletic Shoulder (ASH) test in the "Y" position. By the eighth week, the athlete achieved full participation in competitive activity. Results indicated a significant reduction in pain (VAS < 2) and an impressive restoration of muscle symmetry, with inter-limb strength deficits falling below 10% in all tested positions. In conclusion, a phase-based rehabilitation protocol that respects anatomical constraints and utilizes objective monitoring through dynamometry can ensure a safe and effective return to play for volleyball athletes with complex shoulder pathology.

Keywords: volleyball, bone marrow edema, supraspinatus tear, subacromial narrowing, functional rehabilitation

INJURY MECHANISMS AND ANATOMICAL DISTRIBUTION OF INJURIES IN ITF TAEKWONDO DURING HIGH-LEVEL COMPETITION

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The aim of this study was to record the injury mechanisms and anatomical injury locations among ITF Taekwondo athletes during high-level competition. The sample consisted of 147 male and female athletes who participated in the 2019 ITF Taekwondo World Championship in Plovdiv, Bulgaria. Data were collected using a structured injury recording form completed by the competition physician during the event. The collected information was analyzed using descriptive statistics and chi-square (χ^2) tests through the SPSS statistical software. The results indicated that the most common injury mechanisms were punches and kicks, each accounting for 43.4% of the cases. Among injuries caused by kicks, the most frequent techniques were Yop chagi (38.3%) and Dollyo chagi (25.5%). Regarding the anatomical distribution of injuries, the head was the most frequently affected area (51%), followed by the lower limbs, trunk, and upper limbs.In conclusion, injuries in ITF Taekwondo are mainly associated with the fundamental offensive techniques of the sport. The increased frequency of head injuries may be related to the scoring system of Taekwondo, which awards more points for valid techniques delivered to the head.

Keywords: Taekwondo ITF, injury mechanisms, anatomical distribution, head injuries, kicking techniques

INVESTIGATION OF MUSCULAR DEFICITS IN ATHLETES AT LEAST ONE YEAR FOLLOING ANTERIOR CRUCIATE LIGAMENT (ACL) RECONSRUCTION

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Anterior Cruciate Ligament (ACL) rupture is one of the most common injuries of the knee joint and in most cases is treated with surgical reconstruction. Due to surgery, muscular deficits are often present and require evaluation. The Isokinetic Dynamometer is a tool used to assess muscle performance under conditions of constant velocity and variable resistance. The software allows concentric, eccentric and isometric muscle contraction with the option to select a variety of protocols for either assessments or training. The aim of the study was to investigate muscle deficits in the knee joint using an isokinetic dynamometer in athletes at least one year after ACL reconstruction surgery. The sample consisted of 11 athletes (21.3±1.5 years old) with ACL rupture, with the main inclusion criterion being that at least 12 months had passed since the surgery. Participants performed a concentric contraction protocol (CON/CON) at two angular velocities, 60 °/sec and 180 °/sec, for both knee flexors and extensors. Four repetitions were performed on both limbs at each angular velocity, with the slower velocity (60 °/sec) preceding the faster one (180 °/sec) and the healthy limb tested before the operated limb. The assessment was conducted using TUR Isokinetic Dynamometer and Isoforce software. Subsequently, peak torque values of the healthy and the injured limb were compared during the extension and flexion at both angular velocities. The results showed a statistically significant difference in knee extension at 60 °/sec between the operated and healthy limb ($p<.001$). A statistically significant difference was also found during the extension at 180 °/sec between the two limbs ($p=0.007$). In contrast, during the knee flexion, no statistically significant differences were observed between the healthy and the operated limb at either 60 °/sec ($p=0.471$) or 180 °/sec ($p=0.102$). In conclusion, among the athletes, the quadriceps showed a significant deficit in the operated limb during knee extension at both slow (60 °/sec) and fast (180 °/sec) angular velocities. However, during concentric contraction of the knee flexors, no significant deficits were observed between the healthy and the operated limb.

Keywords: acl reconstraction,isokinetic dynamometer,concentric contraction,quadriceps,hamstrings

RISK FACTORS OF SHOULDER INJURY IN VOLLEYBALL AND PREVENTION STRATEGIES: A SCOPING REVIEW

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Context: Volleyball is characterised by repeated overhead movements, such as spiking and serving, which impose substantial loads on the glenohumeral joint and contribute to a high prevalence of shoulder injuries. These injuries are among the most common overuse problems in volleyball. The aim: To systematically map and synthesise the evidence on risk factors and prevention strategies for shoulder injuries in volleyball players. Data Sources: PubMed, Web of Science, EBSCO, and Google Scholar were searched for peer-reviewed studies published in English between 2005 and 2025. Study Selection: Eligible studies investigated volleyball players of any sex, age, or competitive level and examined either risk factors for shoulder injury or prevention strategies. Studies not related to volleyball, not focused on the shoulder, published before 2005, or in languages other than English were excluded. Study Design: A scoping review was conducted following Arksey and O'Malley's five-stage framework, reported in accordance with PRISMA-ScR guidelines, with study quality appraised using the JBI Critical Appraisal Tools. Results: From 138 records identified, 77 studies met the inclusion criteria. Four recurring modifiable domains were identified: rotator cuff and scapular muscle imbalance, glenohumeral internal-rotation deficit (GIRD), scapular dyskinesis, and workload exposure. Prevention strategies included eccentric external-rotation strengthening, scapular control exercises, posterior shoulder stretching, structured warm-ups, and workload monitoring. Conclusion: Shoulder injury risk in volleyball reflects a multifactorial interaction of intrinsic and extrinsic factors. Although several preventive approaches show promise, evidence is constrained by methodological variability and a lack of high-quality prospective studies. Standardised definitions and more comprehensive long-term investigations are needed to advance prevention and athlete care.

Keywords: Volleyball, Shoulder Injuries, Risk Factors, Prevention, Rehabilitation, Overuse Injuries

THE APPLICATION OF PILATES DURING THE REHABILITATION OF INTERVERTEBRAL DISC HERNIATION AND SCIATICA

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Intervertebral disc herniation is a common spinal disorder, mainly attributed to degenerative changes, which may lead to compression of neural structures, causing low back pain, radicular pain, sensory disturbances, and muscle weakness. Sciatica frequently occurs as a result of irritation or compression of the sciatic nerve or the lumbosacral nerve roots and significantly affects patient's functionality and quality of life. According to the literature, conservative management is considered the first-line treatment, as surgical intervention, although it may provide faster symptom relief, does not demonstrate long-term superiority over non-surgical treatment. Physiotherapy and therapeutic exercise play a crucial role in the management of disc herniation and sciatica, contributing to pain reduction, improvement of mobility, and stabilization of the spine. Of particular interest is the Pilates method, which focuses on the activation of the deep core muscles, enhancement of motor control, and restoration of functionality in a safe and progressive manner. The aim of the present practical training was to improve pain and mobility of the lumbar spine and hip in a 60-year-old woman diagnosed with intervertebral disc herniation at the L5–S1 level and sciatica, through a Reformer Pilates program lasting fourteen weeks, with a frequency of two sessions per week. The intervention program included mobility, strengthening, stabilization, balance, and stretching exercises, tailored to the patient's individual needs and symptoms. The results demonstrated improvements in mobility, muscle strength and endurance, core control and stability, as well as pain reduction and enhanced functional performance in daily activities. In conclusion, the Pilates method appears to be an effective and safe conservative intervention for patients with intervertebral disc herniation and sciatica.

Keywords: disc herniation, sciatica, pilates

THE DESIGN AND IMPLEMENTATION OF A REHABILITATION PROGRAM IN A GRECO-ROMAN WRESTLER FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A CASE STUDY

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Surgical anterior cruciate ligament (ACL) reconstruction is highly associated with persistent muscular imbalances, particularly regarding the quadriceps' and hamstrings' strength, which may significantly limit the athlete's functional capacity and even increase the risk of re-injury. In several cases muscular asymmetries between lower limbs, as well as reduced muscle performance are frequently observed even one year after the ligament reconstruction. These long term muscle imbalances may pose a risk, thereby, the implementation of an individualized and specialized rehabilitation intervention is essential for the athlete's functional return to the sport. The aim of this case study was to implement and evaluate the effects of a rehabilitation program on knee functionality, as well as to facilitate the athlete's functional return to the sport. The sample consisted of a greco-roman wrestler, four months post-surgery, and the supervised rehabilitation program lasted 12 weeks. The athlete's evaluation included both clinical and functional assessments. Specifically, there were assessed parameters such as active and passive range of motion of the knee joint, the presence of edema or pain and valgus or varus alignment of the lower limbs. In addition, isokinetic evaluation (including both angular velocities, 60 degrees per second and 180 degrees per second) was conducted, providing data on muscle strength and power. The rehabilitation program was implemented progressively and in an individualized way. In the initial stage, it primarily included exercises focusing on motor control and proprioception, which were maintained throughout the intervention. Subsequently, based on the athlete's isokinetic results, plyometric and wrestling simulation exercises were incorporated, reflecting the demands of the sport. Concurrently, the participant followed a muscle hypertrophy program throughout the entire duration of the intervention. In conclusion, the results demonstrated complete graft vascularisation according to the athlete's MRI, full restoration of range of motion, and an overall improvement in muscle performance on both lower limbs. Increases were observed in peak torque, mean power and total work in both knee extensors and flexors, reduction in both lower limb asymmetries, and furthermore indicating enhanced force production capacity and improved neuromuscular symmetry. This positive outcome, enabled the athlete to achieve a functional return to the sport.

Keywords: ACL reconstruction, rehabilitation, isokinetic dynamometry, greco-roman wrestler, hypertrophy, functional, neuromuscular symmetry

THE EFFECT OF A REHABILITATION PROGRAM ON IMPROVING MUSCLE IMBALANCES AND DEFICITS OF THE KNEE JOINT IN A PROFESSIONAL FOOTBALL PLAYER WITH PLICA SYNDROME

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In professional football, knee joint injuries occur frequently due to repeated changes of direction and high-intensity rotational movements. The purpose of this case study was to evaluate and subsequently improve muscle deficits and imbalances in the knee joint. The sample consisted of a 22-year-old professional football player diagnosed with Plica Syndrome, three months following knee arthroscopy. The assessment of muscle deficits and imbalances was conducted using an isokinetic dynamometer at angular velocities of 60°/sec and 180°/sec. To address these, a four-week strengthening program was implemented, consisting of three training sessions per week. The program included strengthening exercises targeting the muscle groups involved in the knee joint, utilizing both closed and open kinetic chain exercises, as well as core and hip strengthening exercises, proprioceptive training, plyometric exercises, and sport-specific functional exercises aimed at return to play. Additionally, the isokinetic dynamometer was used as a training tool (at angular velocities of 180°/sec) at the beginning of each session. Following the intervention program, the athlete completely eliminated hamstring strength deficits at both angular velocities and demonstrated an approximant 30% improvement in quadriceps strength. Additionally, deficits between the injured limb and the healthy limb was achieved, indicating restoration of bilateral symmetry. In conclusion, a well-structured, short-term rehabilitation program consisting of 12 sessions can significantly improve muscle strength deficits and imbalances and facilitate a safe and effective return to sport.

Keywords: rehabilitation, deficits, arthroscopy, football, isokinetic evaluation, return to sport, Plica syndrome

ΑΘΛΗΤΙΚΗ ΨΥΧΟΛΟΓΙΑ
SPORTS PSYCHOLOGY

AN EXPLORATORY EXAMINATION OF THE «SPORT MOTIVATION SCALE-II», IN GREECE

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The purpose of this study was to conduct a preliminary examination of the construct validity of the "Sports Motivation-II" questionnaire (Pelletier, Rocchi, Vallerand, Deci & Ryan, 2013) and to examine whether and to what extent factors such as gender and sport type influence the sample. The questionnaire includes 18 questions that form 6 factors, which are: a) Internal Regulation, b) Integrated Regulation, c) Identified Regulation, d) Internalized Regulation, e) External Regulation, and f) Lack of Motivation. Responses were given on a 7-point Likert scale (1=strongly disagree – 7=strongly agree). The sample consisted of 129 athletes, 78 men and 51 women, who participated in team and individual sports. The results of the factor analysis, as well as the reliability checks (CR: .78, OR: .66, CR: .68, CVR: .66, EXR: .73 & ELK: .78), supported the construct validity of the questionnaire. Furthermore, additional statistical analyses regarding gender and sport revealed statistically significant differences. In conclusion, this study highlights the importance and significance of the "Sports Motivation-II" questionnaire in the Greek sports context. Its further use and comparisons with other factors are considered useful and necessary.

Keywords: Sports Motivation-ll,Construct validity,Motivation in sports,Factor analysis,Athletes,Greek context

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN SATISFACTION WITH ATHLETIC PERFORMANCE AND PSYCHOSOCIAL FACTORS AMONG AMATEUR SOCCER PLAYERS

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The concept of athletic performance in soccer has been extensively studied in sport science, particularly in relation to motivational factors and performance outcomes in elite athletes. Furthermore, the role of psychosocial factors in shaping satisfaction with performance remains underexplored. The aim of the present research was to investigate the relationship between interpersonal relationships with coach and the team, and satisfaction with athletic performance in amateur soccer players. A total of 90 Greek amateur athletes participated in this cross-sectional research. Data collection included validated questionnaires assessing coach–athlete relationship, positive team interactions and athletes' satisfaction with own performance. Pearson's correlational analyses revealed statistically significant positive relationships of satisfaction with performance with coach-athlete relationships ($r=0.29$, $p=0.005$) and positive team interactions ($r=0.39$, $p<0.001$) . Athletes who perceive stronger relational support—both from their coach and teammates—tend to feel more satisfied with how they perform. Interpersonal dynamics are not only performance-enhancing but also shape athletes' subjective evaluation of their performance. Understanding satisfaction in amateur athletes is important and could enhance both performance and overall athletic experience.

Keywords: satisfaction, amateur soccer, psychosocial factors, athletic

ESPORTS PLAYERS' PERCEPTIONS OF HEALTH

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This study was based on a qualitative approach, using interviews with Greek esports players to explore their experiences, the challenges they face, and the strategies they use to manage their involvement in digital gaming. A total of 10 players participated in the study (M = 20.88 years, SD = .78). They reported that their involvement in esports began mainly through the influence of friends and family, as well as through frequent exposure to online content, particularly during the COVID-19 pandemic. Most participants described esports as an important form of entertainment and social interaction. Nevertheless, excessive involvement appeared to be associated with negative consequences, such as physical exhaustion, headaches, musculoskeletal discomfort, and increased levels of stress. At the same time, several players emphasized that, when practiced in moderation, esports do not interfere with either their professional goals or their personal development. Overall, the findings suggest that esports can function as a positive and creative activity, provided that they are integrated into a balanced lifestyle. The study highlights the need to design targeted interventions that will help protect the health and well-being of players in this continuously growing field.

Keywords: esports, health, lifestyle

KEY TRAINING PRIORITIES FOR ATHLETE SUPPORT PERSONNEL IN DOPING PREVENTION

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Members of Athlete Support Personnel occupy a particularly important position in shaping athletes' perceptions and behaviors regarding doping-related issues. This study presents findings from a cross-national qualitative investigation, the main aim of which was to examine this population's knowledge regarding doping prevention and the safe use of nutritional supplements. A total of 74 individuals from 12 European countries participated in the study through semi-structured interviews, including coaches, physiotherapists, nutritionists, psychologists, parents, and health professionals. The findings revealed that, despite the significance of their role, many participants do not have access to systematic, evidence-based, and readily available education on matters related to doping and supplements. Some members of Athlete Support Personnel demonstrated a high level of awareness and a clear commitment to the values of clean sport, whereas others reported relying mainly on informal sources of information and feeling uncertain when asked to advise athletes. At the same time, it was found that factors such as social norms, motivational climate, and moral disengagement influence the way these individuals perceive supplements, as well as how they understand their connection to potential pathways leading to doping. Overall, the findings of the study provide a valuable foundation for the development of modern educational interventions that can strengthen the active, informed, and responsible role of Athlete Support Personnel in doping prevention, ultimately contributing to the protection of athletes and the preservation of the integrity of sport.

Keywords: Doping, Support personnel, Dietary supplements

PARENTAL PERCEPTIONS OF SWIMMING AS A PHYSICAL ACTIVITY AT PRESCHOOL AGE

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Parents are primarily responsible for children's initial contact with swimming. This fact highlights the significant parental role during the early stages of athletic development. The purpose of the present study was to examine parental perceptions about swimming as an organized physical activity for preschool-aged children, to investigate the extent of parental involvement in children's swimming activity and to assess potential differences based on the parents' previous swimming experience. Data were collected using closed-ended questionnaires on a 5-point Likert scale, assessing the perceived importance of swimming (Physical Activity Importance and their Children's´ Ability Questionnaire), the reasons for choosing swimming (Participation Motivation Questionnaire), and the level of parental involvement (Parental Involvement in Sport Questionnaire). The sample consisted of 166 parents, aged 31–50, whose preschool-aged children participated in organized swimming lessons. The majority of parents (97%) consider their child's engagement in swimming to be "very" to "extremely" important. According to the responses, parents choose swimming primarily for reasons related to fitness and health (4.30±0.53), while water safety emerged as the dominant individual motive (4.82±0.45). Parental perceptions regarding the choice of swimming tend to vary based on their previous swimming experience. Specifically, parents with previous competitive background tend to place greater emphasis on their child's potential achievement in competitive swimming, in addition to the importance they attribute to physical fitness and learning new skills ("ability to continue exercising and succeed in competitive swimming": competitive background 3.71±1.04, recreational background 3.11±0.87, no background 2.98±1.00, $p<0.05$). Regarding parental involvement, the results suggest that parents exhibit higher levels of praise and understanding (3.49±0.60). However, depending on their experience, parents with a background in competitive swimming showed a tendency toward higher directive involvement in their children's efforts ("telling the child they did not try hard enough after a lesson": competitive background 1,65±0,90, recreational background 1,46±0,83, no background 1,19±0,46, $p<0.05$). In conclusion, parents choose swimming mainly for health and fitness benefits and water safety, demonstrate high levels of praise and understanding and their perceptions and involvement tend to be influenced by their personal athletic background in the sport.

Keywords: swimming, preschool age, parental perceptions, parental involvement

PROMOTING NUTRITIONAL SUPPLEMENTS IN SPORT: AN ANALYSIS OF CORPORATE STRATEGIES

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The market for nutritional supplements in sport is characterized by intense advertising activity and, in several cases, by promotional practices that raise concerns. The present study investigates both the marketing strategies adopted by companies and the ways in which these strategies are perceived by athletes. For this purpose, a mixed-methods approach was used, including in-depth interviews with 49 athletes and a qualitative analysis of 187 supplement retail websites from six European countries. The findings showed that more than seven out of ten athletes (73%) reported having encountered exaggerated or misleading claims regarding product effects. In addition, 41% of the websites included terms associated with anabolic agents or other substances related to doping. At the same time, nearly 28% of the products featured packaging or visual characteristics that resembled strong pharmaceutical products, thereby reinforcing a misleading image of “scientific” or “medical” credibility. Although many athletes appeared to recognize these practices, they still seemed to be emotionally influenced by the promises made and by the appealing image of the products. The study highlights the need for stricter regulatory interventions in order to limit the use of terminology referring to prohibited substances, strengthen the monitoring of commercial communication, and ensure the dissemination of more reliable and scientifically grounded information.

Keywords: Dietary supplements, Doping, Qualitative study

PSYCHOSOCIAL EFFECTS OF PEER BULLYING- VICTIMIZATION IN SPORTS AND SCHOOL ENVIRONMENTS AND PREVENTION STRATEGIES : META-ANALYTIC REVIEW

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Psychosocial Effects of Peer Bullying- Victimization in Sports and School Environments and Prevention Strategies : Meta-Analytic Review This review was conducted to examine the types, effects, and intervention approaches of peer bullying, which is frequently observed in schools and sports settings during childhood and adolescence, in light of the academic literature. The study reviewed academic articles published between 2000 and 2025, and the findings were subjected to content analysis. The most common types of bullying identified were physical, verbal, relational, and digital bullying. Victims frequently experience depression, anxiety, academic failure, social withdrawal, and loss of self-esteem. Furthermore, it was determined that most individuals who are bullied lack adequate social support systems, while those who bully generally exhibit behavioral problems. This study also emphasizes the need for school-based programs, family support systems, and mental health services to work together effectively to prevent peer bullying.

Keywords: Peer bullying, child and adolescent psychology, sports and school environment, psychosocial support and prevention criteria

RELATIONSHIP BETWEEN MEANING, CRISIS OF MEANING AND TEAM SATISFACTION IN SPORT

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The topic of meaning in sport has emerged relatively late in contemporary psychology, and in sport psychology in particular. Studies conducted on professional athletes demonstrate higher-than-normative levels of meaning and correspondingly lower levels of meaning crisis (Schmidt et al., 2025; Pileva & Iancheva, 2025). Significant correlational relationships have also been observed between meaning and components of psychological well-being (Oblinger-Peters et al., 2025; Pileva & Iancheva, 2025; Debats, 1998; Zika & Chamberlain, 1992). The relationship between meaning and team satisfaction, which is crucial for psychological support in team sports, has been less extensively studied. The present study aims to determine the nature of the relationship between meaning, meaning crisis, and satisfaction with the sports teams. To achieve this, a battery of two questionnaires was used: the Meaning and Purpose Scale (MAPS; Schnell & Danbolt, 2023) and the short version of the most widely used Team Satisfaction Questionnaire (Brayfield & Rothe, 1951). Data from the applied non-parametric analyses demonstrate a moderate positive correlation between meaning and team satisfaction ($r = .357$; $p < .001$). Regarding meaning crisis, a weak negative correlation with team satisfaction was found ($r = -.245$; $p < .001$). The results of the regression analysis indicate that the experience of meaning is a significant positive predictor of team satisfaction ($\beta = .301$, $t = 4.132$, $p < .001$), with the model explaining approximately 9% of the variance in satisfaction. It can be concluded that meaning is a key psychological construct influencing satisfaction in sport. However, it is not the only contributing factor. The findings have valuable practical implications for applied sport psychology and for optimizing performance in professional sport.

Keywords: meaning, crisis of meaning, team satisfaction

STRUCTUAL VALIDITY AND RELIABILITY OF THE "PROFILE OF MOOD STATES" QUESTIONNAIRE IN WOMEN PARTICIPATING IN YOGA EXERCISE PROGRAMS

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Regular physical activity has been widely recognized as an important factor in enhancing psychological well-being and improving mood states. Therefore, the use of valid and reliable assessment instruments is essential for accurately capturing these effects. The purpose of the present study was to investigate the factorial structure of the Profile of Mood States (POMS) Questionnaire, a widely used instrument for assessing mood states, as well as to examine its validity and reliability. The sample consisted of 253 women who participated in Yoga exercise programs organized by the Municipality of Komotini. Participants completed anonymously the POMS questionnaire, which consists of 37 items assessing different dimensions of mood. To examine the construct validity of the instrument, an exploratory factor analysis was conducted. The analysis revealed six factors (anxiety-tension, depression, anger, vigor, fatigue, and confusion, which together explained 58.91% of the total variance. The results supported the structural validity of the instrument, indicating strong correlations between variables and their respective factors. Furthermore, reliability was assessed through internal consistency analysis. Cronbach's alpha coefficients for the six factors ranged from .76 to .84, indicating satisfactory internal consistency across all subscales. Overall the findings confirm the structural validity and reliability of the POMS questionnaire in this population. The instrument appears to be suitable and useful tool for assessing mood states in the context of exercise.

Keywords: Mood states, exercise, adult female participants, yoga

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