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Innovation and Sustainability for a Quality Future

Book of abstracts



27th – 28th
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POLITÉCNICO DE SANTARÉM
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Title
Book of abstracts III International Congress - CIEQV
27th and 28th February 2025

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Edição
Centro de Investigação em Qualidade de Vida - CIEQV

Paginação
João Vítor Torres
Vera Lúcia Zymbal

ISBN
978-989-35809-5-0
DOI
`https://doi.org/10.60546/3erx-7x68`

Eletronic edition
Escola Superior de Educação do Instituto Politécnico de Setúbal © 2025

Propriety
Organization Life Quality Research Centre
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The originality of the texts presented is the sole responsibility of their authors.

Financed by national funds through FCT – Foundation for Science and Technology, I.P., under the project nº UID/CED/04748/202

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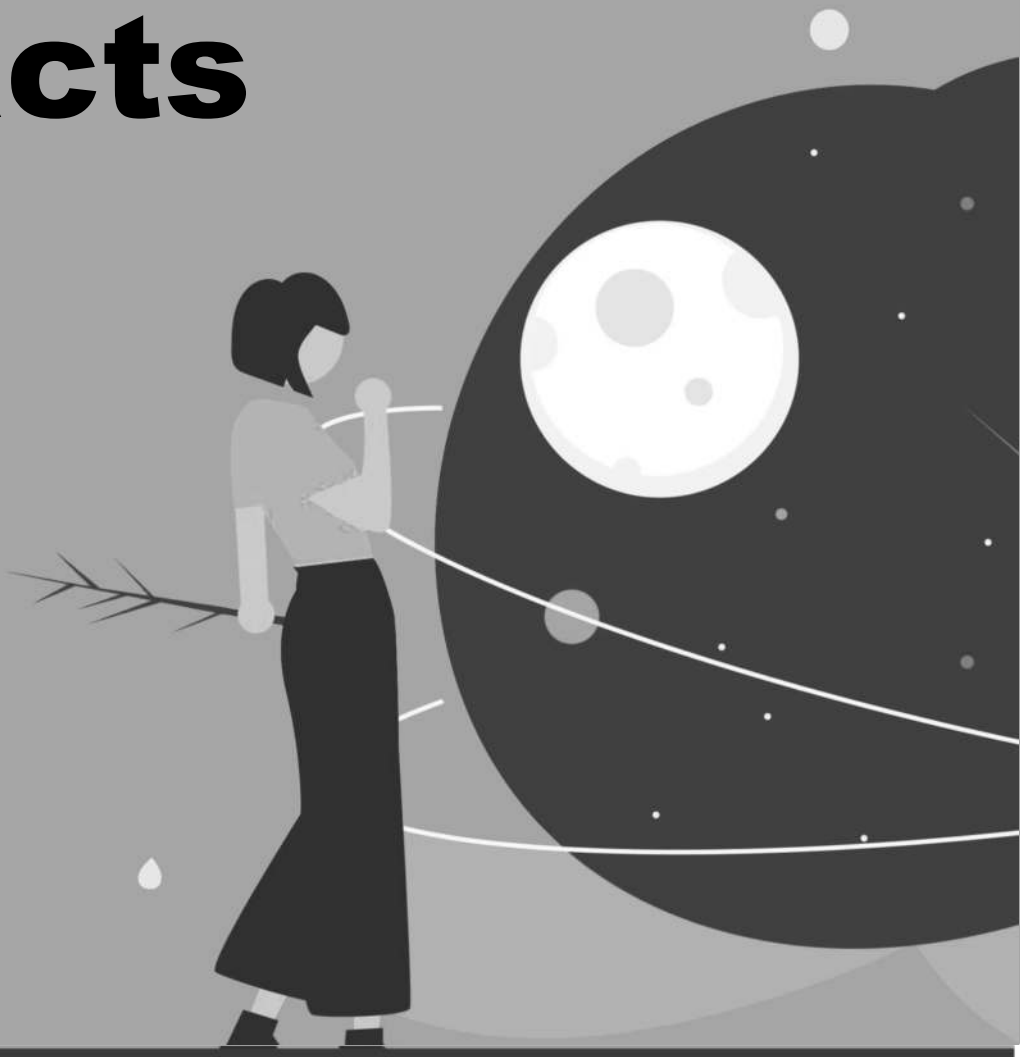

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Conferences

QUALITY OF LIFE

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ABSTRACT

The concept of quality of life is multifactorial, broad and comprehensive (Rodrigues, 2020), and can be understood under different paradigms, individual, social, economic and environmental. Overall, quality of life refers to the level of individual satisfaction and perceived well-being in relation to life in general. We present the framework for inter, trans, and multidisciplinary research in Quality of Life. The research paradigm on the quality of life of citizens in society requires a multifaceted and complex analysis. Quality of life is a subjective measure of individual well-being and can be influenced by many different factors, including health, physical activity, interpersonal relationships, economics, education, and the environment. Research on quality of life can be carried out in different scientific areas, depending on the specific focus and approach, and involves a combination of quantitative and qualitative approaches and paradigms, being conducted by researchers from different scientific fields and specialists in various disciplines. The ultimate goal is to provide a deeper and improved understanding of quality of life, educational and behavioural change processes, and ways to improve the lives of citizens. We present our reflection on inter, trans, and multidisciplinary scientific research and its implications in the evaluation processes of research units, knowing that this topic has been discussed and considered by the governmental agencies for research. It is currently on the agendas of scientific organizations and science leaders all around the world. This is a real challenge for scientific research units, since multidisciplinary paradigms are the basis of our collective organization, and the evolution of research on quality of life can respond to current needs and lead to the improvement of citizens' lives.

Keywords: quality of life; multidisciplinarity; investigation

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Completed the Título de Agregado in Sport Sciences – Sport Pedagogy in 2002 by Universidade de Trás-os-Montes e Alto Douro, Doutoramento in Human Kinetics – Sport Sciences in 1996 by Universidade de Lisboa Faculdade de Motricidade Humana, Mestrado in Educational Sciences – Methodology of Physical Education in 1990 by Universidade de Lisboa Faculdade de Motricidade Humana, Licenciatura in Physical Education in 1983 by Universidade de Lisboa Faculdade de Motricidade Humana and Bacharelato in Physical Education in 1981 by Universidade de Lisboa Faculdade de Motricidade Humana. Published 115 articles in journals. Has 34 section(s) of books and 7 book(s). Organized and Participated in over 100 event(s). Supervised 9 PhD thesis(es) e co-supervised 3. Supervised 19 MSc dissertation(s). Has received 17 awards and/or honors. Participates and/or participated as Principal investigator in 11 project(s) and Researcher in 16 project(s). Works in Sport Pedagogy on Health Sciences with emphasis on Sport and Fitness Sciences, Social Sciences with emphasis on Psychology, Social Sciences with emphasis on Media and Communications and Social Sciences with emphasis on Educational Sciences. In their professional activities interacted with 260 collaborator(s) co-authorship of scientific papers. In his curriculum Ciência Vitae the most frequent terms in the context of scientific, technological and artistic-cultural output are: – People: Athletes; Children; Fitness Instructors; Sport Coaches; Sport Directors; Sport Managers; – Sports: Basketball; Fitness Exercise; Football; Handball; Nature Sports; Paralympics Sports; Physical Activity; Physical Education; Swimming; Volleyball; – Education: Coach Education; Competences and Skills; Education Models; Internship; Life styles Promotion; Professional Assessment; Professional Career; Professional Intervention;Quality of Life Education; – Research Variables: Behavior Observation; Behavior Patterns; Coach Behavior; Competition; Coping; Decisions; Depression; Evaluation Criteria; Expectations; Food chain; History; Instruction; Labor; Non-verbal and verbal Communication; Pedagogical Feedback; Pedagogical Intervention; Planning; Technical analysis; Thoughts.

MONITORING AND MANAGING TRAINING LOAD: KEY TO BOOSTING EMOTIONAL AND SOCIAL WELLBEING IN YOUTH SOCCER PLAYERS

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ABSTRACT

The management and monitoring of training load have emerged as vital components in the performance and well-being of youth soccer players. This study aims to assess the relationship between training load management and the emotional and social wellbeing of young athletes. We employed a mixed-methods approach, utilizing quantitative data through training load metrics and qualitative insights via interviews with coaches and players. Findings indicate that appropriate management of training load significantly enhances players' emotional resilience and social cohesion within teams. Specifically, balanced training regimens, characterized by an optimal mix of workload and recovery, are linked to improved mental health outcomes and stronger team relationships. Furthermore, the study highlights the necessity for training frameworks that not only focus on physical performance but also prioritize the emotional and social dimensions of youth players. Ultimately, this research underscores the importance of a holistic training approach, where monitoring training load serves as a key strategy in fostering both psychological wellbeing and social connection in youth soccer contexts.

Keywords: training load; emotional wellbeing; training management; youth soccer; social cohesion

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Professor in the Dep. of Physical Education and Sports at the Faculty of Sport Sciences, University of Granada, Spain. His research interests encompass a range of critical areas in sports science, including: i) Cognitive performance in sports; ii) Youth sports performance; iii) Decision-making processes and iv) Soccer. Francisco Tomás is dedicated to advancing knowledge in these fields and contributing to the development of future athletes.

SOCIAL DETERMINANTS AND HEALTH INDICATORS FOR QUALITY OF LIFE

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ABSTRACT

Healthy Aging is a paradigm centered on the empowerment of the person, as an agent promoting balance throughout their life cycle, which results in responsibility for their own health. Complexity in health results from the existence of multiple factors, which are important to understand and explore in depth with a transdisciplinary vision, both from the perspective of science and the research that decodes it and supports evidence-based practice. Knowledge of Social Determinants from a bioecological perspective makes it possible to monitor people, families and communities in specific contexts, studying the processes and the time in which they occur, namely by using the Health Indicators associated with them. And it is from this perspective that it is important to associate and deepen the transdisciplinary perspective, essential to understand the relevance of Quality of Life in the Healthy Aging process. Objective: To discuss the research paradigm in the field of Healthy Aging with Quality of Life. Methods: Mobilizing the previous conceptual framework, we deepened scientific evidence by carrying out a Scoping Review supported by two review questions (acronym PCC), through the PubMed platform (MEDLINE), over the last five years. Findings: We included 58 documents (56% primary studies - quantitative; 42% secondary studies: Meta-Analysis, Systematic Review and Narrative review; 2% Editorial and Report). Considering geographic provenance as representing a worldwide perspective. We found a predominance of age groups (P) Adult, Older Adult and Elderly Person). Regarding concepts (C), the following prevail: Social Determinants; Healthy Aging; Elderly Person and Quality of Life, the latter with less expression. Related to these, we essentially identify diet (Mediterranean diet) and physical activity as promoters of healthy aging. As for contexts (C), there is diversity, from home to hospital. Considering one of the objectives related to the validation of the identified scientific evidence, we suggest the relevance of continuing the present research paradigm, deepening the study of the age groups that identify pregnant women, postpartum women and newborns, as well as children and young people. With this strategy, we consider ourselves to be a reference for the study of the healthy aging process throughout the life cycle and in association with quality of life, as this is the concept least represented in the evidence.

Keywords: Healthy Aging; Healthy Lifestyle; Health Status Indicators; Quality of Life; Social Determinants of Health.

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José Amendoeira



Research is my main goal, searching for more actual evidence in the educational field of Nursing Science and Clinical Intervention, promoting the evidence based practice. The internationalization is a strong goal in my activity. The oportunity to work with EMECC Nursing with nurses from all around the world! At last, but not the least my activity with PhD students from the great Nursing PhD programme of Portuguese Catholic University.

INTRODUCING FLYING DISC IN SCHOOLS

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ABSTRACT

The global development of disc sports has found in schools a favorable environment for their expansion and for introducing the sport to new practitioners. The curricular analysis in Portugal and other countries allows for a better understanding of both the challenges and opportunities for the effective implementation of these sports in schools. Ultimate and other disc sports have been increasingly incorporated into educational institutions, reflecting a new trend. This analysis of the current state of the sport enables strategic planning for the future of students who learn and practice it, providing expectations and opportunities for continuity in sports participation and personal development. Beyond the competitive aspect, the practice of disc sports promotes the development of motor skills, communication, teamwork, self-control, and ethics. The concept of the "*Spirit of the Game*" stands out as a fundamental principle, emphasizing passion, dedication, and collective effort as essential values for the sport and for students' education (Amoroso et al., 2021; Crocket, 2015). At the international level, the inclusion of disc sports in Cape Verde's national physical education curriculum from 2024 onwards is particularly noteworthy, as well as the growing development of the sport in countries such as Brazil, China, Croatia, Spain, and Lithuania. These advancements demonstrate the global recognition of the sport and its positive impact on sports and educational development. Regarding adaptive sports, the 2nd Wheelchair Ultimate World Championship (WWUC 2025) will be a significant milestone for the sport, consolidating its presence on the international stage. The organization of this championship reflects the continued expansion of disc sports and their relevance in promoting diversity and accessibility in sports (Amoroso 2021).

Keywords: Disc Sports; Physical Education; Ethics; Sports for all; Parasport

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José Amoroso



Contributions to Science and Society

a) New Ideas, Tools, and Knowledge

Since discovering Ultimate in 2000, I have actively promoted sport nationally and internationally, focusing on its unique features aligned with EU educational pillars.

Key Milestones:

- Books: Published the first disc sports manual in 2016, promoting school integration despite political challenges. The 2019 edition gained WFDF's support, leading to translations into English (2020), Croatian (2021), Chinese, and other languages.
- Wheelchair Ultimate: Authored the first Wheelchair Ultimate book (2021), leading to the first World Championship in 2023.
- Research: Focused on "Spirit of the Game" (SOTG), emphasizing self-refereeing even in world championships.

Global Contributions:

- Education and Ethics: Portuguese Sports Ethics Ambassador since 2018; curriculum validation team member in Cape Verde, integrating Ultimate into its 2024 PE curriculum.
- European Projects: Led multiple Comenius and Erasmus projects, including the VIBES virtual reality project, enhancing knowledge exchange and building networks.
- WFDF Manual for Kindergartens: Coordinating a global disc sports manual for preschoolers, with planned translations into six languages.

b) Training and Career Development

Sharing knowledge has driven my career. Since my PhD, I've collaborated with international researchers, including senior scholars like Jay Coakley. I currently lead two research teams and participate in two research lines.

Project Leadership:

- Erasmus+ Sport Project: Leading the PRO-Values initiative promoting disc sports across Europe with partners from Belgium, Ukraine, Austria, Cyprus, and Portugal. Supported by multiple European and international federations.
- Research Collaboration: Attracting master's and PhD students while fostering research teams focused on Ultimate's social and educational dimensions.

c) Contributions to the Scientific Community

2023 was a milestone year for scientific dissemination, marked by extensive conference and seminar participation (see ORCID). My works have explored Ultimate's unique features, including mixed-gender play, self-refereeing, and open divisions where all genders compete together.

Research Highlights:

- Ultimate's Social Impact: DOI: 10.3390/youth3010028

- Self-refereeing and Fair Play: DOI: 10.3390/sports10120197
- Communication in Sport Teams: DOI: 10.3390/socsci10080300
- Teamwork in Sport Psychology: DOI: 10.3389/fpsyg.2021.712904

Future research will expand into disciplines like GUTS, Freestyle, Disc Golf, and Double Disc Court.

d) Contributions to Society

The creation and dissemination of disc sports have been central to my career:

- Community Building: Founded Portugal's largest disc sports club in 2012.
- Educational Outreach: Trained 500+ PE teachers, distributed thousands of discs, and donated textbooks to schools.
- Social Impact: Introduced Ultimate in Cape Verde and Madeira's schools, reaching every student. Partnered with public and private entities for funding and material distribution.

Scientific Production and Selected Activities

Publishing manuals in 2016 and 2019 was pivotal for spreading disc sports in schools and beyond. These works helped PE teachers integrate the sport into their classes by emphasizing core principles like self-refereeing, gender equity, and the "Spirit of the Game."

THE CHALLENGES OF INTEGRATING EMERGING TECHNOLOGIES IN EDUCATIONAL CONTEXTS: IMPLICATIONS FOR RESEARCH AND TEACHER TRAINING

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ABSTRACT

Technologies are central when we consider human artifice, and the achievements of societies. They became absolutely central to how we respond to, and resolve, problems and needs, including those understood as social and educational, often risking technological reification and salvationism. Emerging technologies hold promise and disrupt educational contexts, relations and practices in ways that are familiar and unfamiliar. They challenge us to confront and recognize old and new issues and questions affecting our educational contexts, our students and teachers, our practices and ideas of how educational change can and should take place. Emerging technologies (also) generate problems and needs - recognized, for example, in terms of teacher training - and new lines and methodologies in educational research. Strategies involving gamification, and digital games in particular, can be looked at as such kinds of technologies. They appear promising to address educational needs and problems (e.g. the engagement of students), and there are visible investments in terms of understanding how they can contribute to the tasks of educational institutions. Besides, they come with a set of problems and needs of their own, when considering how they could fit in formal educational settings (e.g. time constraints, issues of access to technology, issues of teacher training). Digital games, and gamification strategies, create (potentially, in some ways and some contexts) disruptions - it could be said. In fact, it could also be said that they reinforce contextual practices that are 'counter-transformative' and 'anti-disruptive' and become powerful ways of doing more of the same (under a different guise). The challenges they pose, and the possibilities of change to be imagined, should take into consideration both what Papert calls the technocentrism of education and a growing need of decentering from technology while pursuing the promises of disruption. The reflection we propose will be illustrated with research on the role of games in learning and teaching History, and the place of video games in the training of History teachers in Portugal.

Keywords: digital technologies; educational change; teacher training.

Pedro Ferreira



Pedro D. Ferreira is an Associate Professor at the University of Porto and a Center for Educational Research and Intervention (CIIE) member. He obtained his PhD in Psychology from the same University in 2007.

He has been teaching and researching at the Faculty of Psychology and Educational Sciences since 2009. Although he has primarily dealt with issues of civic and political participation of young people and adults and their implications for political education and political development, he has more recently broadened his interest and focus, researching the ways in which digital contexts and technologies are relevant to the construction and practices of citizenship of diverse audiences, including children, young people, adults, and older adults. He has participated in several nationally and internationally funded research projects, including PIDOP – Processes Influencing Democratic Ownership and Participation (2009-2012, FP7), CATCH-EyoU – Constructing AcTive CitizensHip with European Youth (2015-2018, H2020), the Study on Political Participation of Young People in Portugal (2020-2021, Calouste Gulbenkian Foundation), the Study on Post-Secondary and Higher Education in Cybersecurity in Portugal (2021-2022, National Cybersecurity Center, CNCS), the Mid-Term Evaluation of the Results of the Active Citizens Program (2022, Bissaya Barreto Foundation and Calouste Gulbenkian Foundation), and the Evaluación de Impacto de un dispositivo de Educación Ciudadana Sobre Gestión de la Diversidad en Organizaciones Sociales y Empresas Iberoamericanas (2021-2023, Organização de Estados Ibero-Americanos, OEI) in the last three of which he held coordinating positions. His coordination experience extends to the projects JoSeES – Serious Games in Higher Education: Impacts, Experiences and Potential (2016-2019, Fundação para a Ciência e Tecnologia, FCT) and the international project DISK – Digital Immigrants Survival Kit (2019-2022, Erasmus+ program). These completed projects show how the intersections between digital technologies and social and educational issues have been affirmed in his career and how he has furthered his national and international recognition. He is currently coordinating the project SCIREARLY – Policies and Practices Based on Scientific Research for Reducing Underachievement and Early School Leaving in Europe (2022-2025, Horizon Europe), a project focused on early school leaving and school success in basic skills, including digital skills, and wellbeing. He is a member of the Ethics Committee of the University of Porto, a member of the Portuguese Society of Educational Sciences (SPCE), a member of Trama Diveroamericana, a network focused on promoting and researching diversity, and the Deputy Secretary General of the Ibero-Latin American Association of Political Psychology (AILPP).

VALUING PEOPLE IN THE DIGITAL AGE: HUMAN GOVERNANCE AS A PILLAR FOR SUSTAINABLE AND DIGITAL-DRIVEN ORGANIZATIONS

Maria José Sousa

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ABSTRACT

In the digital age, the concept of Human Governance has been gaining increasing relevance, promoting a management approach centred on human development, ethics, and social responsibility. As organizations focus on their digital transformation, valuing people becomes a strategic pillar for sustainability and innovation. This governance model emphasizes the importance of aligning employees with the company's purpose and cultural values, ensuring their engagement in a fast-changing and technology-driven world. It is important to explore how Human Governance practices contribute to building healthier, more inclusive, collaborative, and resilient digital work environments, aligned with sustainability principles. Additionally, it is also important to examine the impact of these approaches on people retention, skills development, organizational culture, and business competitiveness in the face of rapid technological advancements. Integrating Human Governance into corporate strategies is essential for organizations seeking to balance economic growth, digital transformation, and corporate social responsibility. Companies need to position themselves as key players in a global digital world, fostering not only sustainable development but also the well-being and continuous professional growth of their employees.

Keywords: Human Governance, Digital Transformation, Organizational Sustainability, Organizational Ethics, People Development, Sustainable Employability, Innovation

Maria José Sousa



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AGROECOLOGICAL PERSPECTIVES FROM THE PAST TO THE PRESENT: AGRICULTURAL SYSTEMS AND BIOCULTURAL KNOWLEDGE AS CREATORS OF FOOD LANDSCAPES

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ABSTRACT

Agroecology, as both a scientific discipline and a practice, has evolved through centuries of traditional knowledge, environmental adaptation, and socio-cultural innovations. From ancient agricultural systems to contemporary farming models, agroecological perspectives emphasize the interconnectedness of ecosystems, human communities, and food production. Traditional farming methods, deeply rooted in rural and local knowledge, have long maintained ecological balance while fostering biodiversity and food security. In contrast, industrial agriculture has often disrupted these relationships, leading to biodiversity loss, soil degradation, and socio-economic inequalities. By exploring the historical evolution of agricultural systems and the role of biocultural knowledge in shaping food landscapes, including the so called 'invisible' role of women farmers, it seems to be possible to reshape and change the attractiveness of rural territories. Understanding the past offers critical insights for designing resilient food systems that support environmental sustainability, cultural heritage, and social equity in the present and future. Research and training, collaboration and cooperation, together with appropriate and effective policy support are essential to scale these benefits and address global food system challenges. Initiatives like the projects "MAIs.Women Farmers in the Inner Territories" and "PAGE.Agricultural and Food Landscapes with generations of women farmers and Youth" based on the theory of change and participatory tools, from the diagnosis phase to intervention and evaluation, are supporting the technical, personal and collective empowerment of women and young farmers and contributing to the visibility of their social role, promoting gender equality and revitalizing rural territories.

Keywords: women farmers, youth, biocultural knowledge

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THEME 1



Quality Education

THEME 1

Oral communications

LESSON STUDY AND THE DEVELOPMENT OF PRE-SERVICE TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE TO TEACH MATHEMATICS

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ABSTRACT

Lesson study (LS) is an effective approach for improving mathematics teaching and learning across various contexts. It involves collaborative planning, implementation, and reflection among teachers (Quaresma et al., 2018). Particularly, LS has been shown to be an effective approach for developing teachers' pedagogical content knowledge (PCK) to teach mathematics and improving instructional practices (Baki & Arslan, 2022). PCK is a fundamental component for effective teaching and plays a crucial role in teacher education, however, the literature reveals that most of the pre-service teachers' difficulties stem from their PCK (Baki & Arslan, 2022). The purpose of this research is i) to understand how the deepening of pre-service teachers' PCK is related to the characteristics and activities carried out within the LS and ii) to identify the pre-service teachers' perceptions regarding the contribution of the LS, as a formative process, to the deepening of their PCK. This study follows a qualitative methodology, and the data was obtained through document collection (pair and individual student reports) and through a survey (primarily featuring open-ended questions). The participants in the study are students who attended the 1st cycle didactics course of the master's programmes qualifying for teaching at ESE/IPS (2023-24). The results shows that the different phases of the LS contributed to enhancing the future teachers' PCK, particularly regarding the anticipation of students' difficulties and resolution strategies; the teacher's actions to help students overcome those difficulties; the use of teaching strategies associated with an exploratory approach; and the methods of preparing and guiding a collective discussion. As for their perceptions, the future teachers having deepened their knowledge of the teaching topics, they highlight the importance of the LS planning phase and point out that the main challenges in their practice are related to the support for students' autonomous exploration of the task and the moment of collective discussion.

Keywords: Lesson study; Pedagogical content knowledge; Mathematics education; Teacher training.

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BUILDING TEACHER COLLABORATION FOR PROFESSIONAL WELL-BEING AND INNOVATION IN PUBLIC EDUCATION

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ABSTRACT

In 2012, I composed my master's thesis centred on collaboration among educators in public institutions within a context marked by uncertainty, highlighting the tensions between cooperation and meritocratic competition as well as their implications for educational effectiveness and equity in schools. During the 2023/2024 academic year, I led a group of undergraduate students in Basic Education, who aimed to revisit this research through a survey like the original, albeit with modifications suited to the contemporary context. The objective was to undertake a comparative study that addresses the current challenges faced by public education in the first instance. However, this initiative transcends mere redundancy or an archaeological enquiry of the 2012 data; it represents a genuine investment into confront emerging issues that reveal the complex and sensitive nature of teacher collaboration, often accompanied by significant discomfort among educators in Portuguese schools. A closer analysis reveals three predominant implications contributing to the stifling of teacher collaboration: the aging teaching workforce and the growing fatigue of educators; the ambiguous relationship between collaboration and pedagogical intervention, which does not always resonate with the teaching vocation; and the limited social recognition of teachers' contributions. This multifaceted context challenges the professional identity of educators and shows that the effectiveness of collaboration is largely determined by the surrounding context, well-being, and institutional support. Consequently, the necessity of fostering a school culture that encourages and facilitates ongoing interaction among teachers becomes evident. This study also marks the beginning of the DRAFTER research project (Designing Teaching Vocation for 21st Century), funded by FCT, which seeks to develop teaching vocation, aiming to discover new methods to value and support educators.

Keywords: Teacher's collaboration; Well-being; Vocation; Innovation; Education

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TRAINING AND PRACTICING STEAM OUTDOOR ACTIVITIES: TEACHERS' PERCEPTIONS

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ABSTRACT

Outdoor learning affords reconnection with nature, observation, data collection and analyses, and reflection, being a well-adjusted complementary resource to STEAM approach; because it allows interdisciplinarity and transferability between different disciplinary areas, improving contextualized learning (Molina & Tasiopoulou, 2023; van Dijk-Wesselius et al., 2020). Several studies highlight the potential of outdoor learning, such as increasing motivation to learn, developing interpersonal skills and improving academic performance (Browning & Rigolon, 2019). Additionally, it provides physical and mental health benefits for students by reducing stress and promoting physical activity (Reese, 2018). Although educational professionals recognize the potential of outdoor learning (Erdem, 2018), it is still not widely practiced in schools (van Dijk-Wesselius et al., 2020). Barriers like the lack of knowledge and confidence of teachers, safety issues, curricular requirements and organizational pressures in schools (Correia et al., 2024) are mentioned. To this end, teacher training can play a fundamental role (Pitiportapin et al., 2023). Correia et al. (2024) found that teachers perceive the relevance of in-service training for the use of outdoor spaces, changing practices and promoting interdisciplinarity, and demonstrated receptivity to participating in training programmes. The School of Education of Santarém has a post-graduate programme in STEAM Education, and to better correspond to teachers' needs, the project STEAM Education Outdoor (LQRC) envisaged to improve and evaluate an in-service training plan that supports education professionals to develop interdisciplinary outdoor learning scenarios, using active methodologies and digital tools. The first step involved interviewing former postgraduates to assess how the program met their needs and influenced their STEAM Outdoor experiences. Preliminary content analysis suggests that participants highly valued the training but highlighted areas for improvement, particularly in diversifying activities and enhancing practical components. Nevertheless, the sustainability of this approach may depend on material resources availability and the existence of a collaborative environment.

Keywords: in-service teacher training; interdisciplinarity; outdoor learning; post-graduation; **S**TEAM Education.

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CURSIVE WRITING PROFICIENCY IN PORTUGUESE PUBLIC ELEMENTARY SCHOOLS: EXPLORATORY STUDY

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ABSTRACT

Cursive writing is essential for academic success (Van der Meer & Van der Weel, 2024). After 3 years of school children should have acquired handwriting proficiency (Maeland & Karsdottir, 1991; cf. Thibon et al., 2018). Our objective was to describe the proficiency in cursive handwriting from a convenience sample of public basic schools, from the center of the country. It was asked to 67 children, from 3 different schools (2nd grade=24, 15 girls; 3th grade=24, 12 girls; 4th grade=19, 10 girls; 1 autist, 1 ADHP, 1 dyslalic, with individual pedagogical support), to write the lowercase and uppercase alphabet, at a comfortable pace, on a plain A4 sheet of paper, that were evaluated based on Chambel & Catela (2020) protocol. It was asked to teachers to identify those children that were below and at the expected academic level. For comparisons, Kruskal-Wallis (with Bonferroni correction) and Mann-Whitney tests were used, with Monte Carlo Exact test. Results: No significant differences were found between academic levels, nor between children with and without developmental problems. 2nd grade was significantly faster than 3rd grade in lowercase, and faster than 3rt and 4th grades in uppercase letters. In lowercase, 2nd grade revealed significantly less typographic occurrences and less letters fragmentation than 4th grade. All grade levels wrote lowercase significantly faster than uppercase. Writing velocity was similar to other international studies. Discussion: Older children revealed greater cursive frailties, but the design study does not allow to identify causes; maybe, more frequent use of typing could be a factor. Velocity differences between lowercase and uppercase maybe be attributed to letter dimension and complexity, and frequency of use. With individual pedagogical support, effects of dyslalia in cursive writing may be mitigated. Conclusion: In these schools, individual students' needs for cursive are ensured, affording efficient and structural basis for academic learning.
Keywords: cursive writing; proficiency; alphabet; basic education; public school.

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CURSIVE WRITING PROFICIENCY IN 8 AND 9 YEARS-OLD GIRLS AND BOYS IN A 3rd GRADE ELEMENTARY SCHOOL CLASS: EXPLORATORY STUDY

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ABSTRACT

The most frequent problems in handwriting are size letters variability and spatial orientation (Wann & Kardirkamanathan, 1991). The lack of fine motor control contributes to incorrect size and retouching letter parts (Simner, 1982). After 3 years of school, handwriting proficiency is expected (Maeland & Karsdottir, 1991). Our objective was to assess the qualitative and quantitative aspects of cursive writing proficiency in a 3rd grade class. It was asked to 8 (n=29, 14 girls) and 9 (n=11, 5 girls) years-old to write the lowercase (LC) and uppercase (UC) alphabet, at a comfortable pace, on a plain A4 sheet of paper, that were evaluated based on Chambel & Catela (2020) protocol. Results: Nine years-old were less homogeneous in the number of letters written (Z=2.83, p=.012). Girls revealed greater qualitative proficiency (Z=2.69, p=.008). Those who misaligned the sequence of letters, and, those who made adjustments in the LC, also did it with UC (C=.474, p=.023; C=.313, p=.054, respectively). A direct association occurred between irregularity in the relative height of LC and megalography, retouching, and illegibility in UC (C=.423, p=.034; C=.381, p=.024; C=.423, p=.003; respectively). A direct association occurred between illegibility of LC and misalignment (C=.474, p=.023). A direct association occurred between illegibility in the relative height in LC and UC (C=.539, p=.012). Retouching was the most frequent qualitative problem in LC (27.5%) and UC (30%). Who wrote more LC and spent less time doing it, also did it in UC (rho=.642, p<.001, rho=.635, p<.001, respectively). The use of dots or dashes, to spatially separate letters, occurred in 15% of children. Discussion: Older children revealed more heterogeneity in letters remembering. Boys had lower cursive proficiency (Semeraro et al., 2019). Spatial difficulties are prevalent. Possibly, fine motor activities, along with spatial perceptual ones, would help to remedy this class's heterogeneity in cursive writing proficiency.
Keywords: cursive writing; alphabet; elementary school; gender; age.

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BIODIVERSITY AND CITIZEN SCIENCE: CONNECTING PEOPLE WITH NATURE

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ABSTRACT

Citizen science involves citizens in research projects that mobilize science process skills to collect and analyse authentic data, with a particular focus on biodiversity studies (Lüsse et al., 2022). In this context, student teachers participated in identifying and monitoring biological diversity while gathering valuable data. Digital tools can be used to carry out collaborative projects related to biodiversity in an educational context. Twenty-seven students of the 2nd year of a Portuguese pre-service teacher undergraduate degree, attending the optional subjects "Environmental Studies" or "Experimental Research Workshop", explored the rich cork oak forest surrounding the Polytechnic Institute of Setúbal. These activities, aimed at fostering active citizenship, involved fieldwork, laboratory tasks, and desk-based research (Ferreira & Simões, 2024). Students also developed skills in using digital tools, namely the free app Seek by iNaturalist to identify species and the iNaturalist citizen science pltaform to share their findings. These tools serve to connect people with nature and contribute with empirical data on biodiversity to support scientific research (Echeverria et al., 2021; Nugent, 2020). This communication discusses some of the educational strategies implemented in the project, designed to explore plant biodiversity, namely, herbaceous plants, shrubs, and trees. It highlights the role of citizen science in enhancing learning and in improving the relationship between science and the environment and, therefore, has the potential to be an important pedagogical tool in learning about immediate surroundings (Smith et al., 2021). The use of the app Seek and the platform iNaturalist are a good example of how students can monitor and value biodiversity, using accessible technology. This communication also presents and discusses some of the students' observations, emphasizing their contributions to citizen science and the promotion of biodiversity. Furthermore, it addresses the benefits and challenges associated with integrating these digital tools into diverse educational contexts, from the perspectives of students, future teachers.

Keywords: biodiversity; citizen science; pre-service teacher education; Seek by iNaturalist app; iNaturalist platform.

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VIDEO AS A RESOURCE IN PRESERVICE TEACHER EDUCATION

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ABSTRACT

This communication aims to: (i) analyze the influence of the use of classroom videos in the development of algebraic thinking in a mathematical content course in an undergraduate program in elementary education (ii) discuss the relevance of the collaborative work between the trainer who taught the course unit and the elementary teacher who participates in the videos for the construction of quality resources. This communication addresses part of a training experience carried out with preservice teachers, in the curricular unit Patterns and Algebra, within the scope of a broader study (Cabral, 2021).The methodology was qualitative, the methods of data collection included participant observation and documents collection of preservice teachers' productions and participants are two pairs of preservice teachers. During the sessions, the preservice teachers were confronted with several classroom videos of collective discussions in which elementary students presented and discussed their tasks resolutions. The tasks that the elementary students solved and that are presented in the videos were mathematical similar to those carried out by the preservice teachers in the same session in which they watched the video. Videos in which preservice teachers contact with student's mathematical activity are particularly important to support the development of the ability to notice children's thinking (Jacobs et al., 2011). To prepare the videos referred to in this communication, the trainer and the elementary teacher worked collaboratively to ensure the scientific and pedagogical quality of these resources. The results show that, in addition to the use of videos having contributed to the preservice teachers developing aspects associated with content *knowledge and students' knowledge* (Shulman, 1987), it promoted the contact with quality classroom practices. This study also promotes reflection about the relevance of teachers' contribution in the construction of quality resources for teacher education.

Keywords: videos in preservice teachers' education, collaborative work, content knowledge, students' knowledge

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WALKING FOOTBALL AND QUALITY EDUCATION: INNOVATION FOR SUSTAINABILITY AND LIFE QUALITY – STUDIES WITH CLUSTERS OF ELDERLY PEOPLE

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ABSTRACT

The main objective of this communication is to present data on a new modality that combines the role of lifelong education, sport and active and healthy aging. Walking Football, created in 2011 in England and start in Portugal in 2015 combines the benefits of moderate physical activity with social and cognitive aspects, and it is especially attractive to older people (Jacob et al, 2024). Several studies highlight how this modality serves as an inclusive and impact tool, promoting autonomy, preventing functional decline and increasing overall life quality. Methodology: This is a mixed study with quantitative data collected via an online questionnaire, with a free and informed consent protocol, ethically validated by RUTIS, and collected in person from the sample assisted by the researchers. Participants: elderly people sample: 212 aged 50+, of both genders, living in Portugal and enrolled in walking football. Results: 31 per cent of the athletes hadn't played sport before; 98 per cent of the athletes feel refreshed after playing; 82 per cent feel totally satisfied playing and 17 per cent feel very satisfied. Qualitative data demonstrates growth requires a need for comprehensive attention to life quality and sustainability and demonstrates growing appreciation of walking football in Portugal and the need for training in this sport. Advances in the various areas of innovation and human development and better living conditions will provide a longer-lived society with more global health concerns (Taylor & Pringle, 2021). According Andersson et al. (2023), Chorleton et al. (2021), Rueda and Martinez (2024), In this sense, psychological health plays a crucial role in the life quality by appealing to multidisciplinary approaches contributing to physical and psychological well-being.

Keywords: Walking Football, Life Quality, Education, Elderly.

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PROJECTS TO PROMOTE GENDER EQUALITY IN EDUCATION: HOW TO EVALUATE?

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ESE/IPS e CIEQV

ABSTRACT

The aim of this communication is to explain how we tried to evaluate the results of the implementation of a project to promote Gender Equality (Equality between women and men) in a private kindergarten and primary school, using the whole-school approach. The initiative for the project came from the school itself, based on a problem that led it to request support from two external entities; one governmental and specialized in the area (CIG) and the other public, dedicated to teacher training (ESE/IPS). This partnership, which lasted three/four years (2017-2021), involved children, educators and teachers, non- teaching staff, technicians and families in the project. Our specific challenge was to promote the evaluation of the project's process and results. Evaluating projects in the social area is naturally more complex and difficult than in other areas of knowledge, since it focuses on attitudes and behaviors, and even more so when it takes place in a sensitive area and with participants of such different backgrounds, ages and statuses. Indicators were built in relation to the project's objectives, supporting the same basis for questioning and analysis for all those involved, some of which can certainly be replicated in projects with this theme. However, in this communication we intend to highlight the techniques and instruments we used to question the children (aged 4-10) and listen to their voices, as it was extremely challenging to do so properly.

Keywords: evaluation, gender equality, education

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DISTANCE LEARNING IN HEIS - STRENGTHENING SOCIALISATION ON VIRTUAL CAMPUSES

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ABSTRACT

Socialisation is a pivotal factor in the process of learning, both in physical, face-to-face settings, virtual and online environments (Loureiro, 2013). However, the act of socialising within online spaces can present challenges, often resulting in social isolation and subsequent withdrawal from training courses. Dillenbourg (2000) proposed a set of characteristics for virtual learning environments (VLEs), including their role as spaces for information and socialisation, where students actively participate in the learning process. These VLEs extend beyond the confines of distance education by integrating multiple tools that complement the physical classroom environment and are explicitly represented. Immersion is considered a profound psychological state that influences mental and sensory processes, optimising learning by focusing attention, controlling variables, and providing feedback. This phenomenon relies on three dimensions: narrative, challenge/agency, and system (Agrawal et al., 2020; Morgado, 2022). The design of virtual spaces for socialisation should ensure flexibility, interaction, and resource manipulation. However, how immersive environments support socialisation strategies is underexplored, requiring further study and refinement (Pedrosa & Morgado, 2024). This proposal aims to examine the key considerations for designing a virtual campus that fosters socialisation. The premise underpinning this approach is that, while the learning process is inherently individual, it is also influenced by an individual's capacity for socialisation. This suggests that the more a person socialises, the more likely they are to acquire new knowledge (Loureiro, 2013). The results obtained from analysing several studies and collected through a literature review are presented. This analysis led to the proposal of the design of 3D immersive spaces for socialising in two virtual campuses of two higher education institutions (HEIs). A design-based research (DBR) methodology was adopted to develop these immersive spaces. This methodology was developed for applied research in education, particularly in the field of educational technology and distance learning (Matta, Silva & Boaventura, 2015). The design incorporates considerations of the context, needs and target population of each institution, and integrates avatars to foster a sense of presence and leverages the dimensions of immersion to create environments conducive to meaningful social interactions.

Keywords: Distance learning; immersive worlds; socialisation; virtual campus; Higher Education.

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THE IMPACT OF THE FLIPPED CLASSROOM MODEL ON PRE-SERVICE TEACHERS' SCIENCE SELF-EFFICACY

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ABSTRACT

The Flipped Classroom Model (FCM) has gained prominence as a blended learning approach that fosters technology-enhanced, student-centred learning. Its application has shown promise in enhancing trainees' self-efficacy in engaging with science content (González-Gómez et al., 2022). Self-efficacy is of pivotal importance within the field of teacher education, being strongly associated with teachers' performance and professional commitment (Bandura, 1977). Developing preservice teachers' (PSTs) self-efficacy in science teaching is crucial to nurture their confidence in delivering effective early childhood and primary science education (Menon et al., 2023). This study investigates the impact of the FCM on science teaching efficacy beliefs among PSTs enrolled in a general science course within the basic education program at the School of Education, Santarém Polytechnic University. The study was conducted over a period of 14 weeks and employed a mixed-methods approach. The quantitative dimension followed a quasi-experimental design with a pretest-post-test control group, utilizing the Science Teaching Efficacy Beliefs Instrument (Riggs & Enochs, 1990) to collect data. The experimental group, consisting of 22 PSTs, participated in a science FCM-based course. The control group of 17 PSTs completed the course under the existing curriculum without intervention. Qualitative data were gathered through semi-structured interviews with the experimental group. Results revealed a significant increase in science teaching self-efficacy beliefs among PSTs in the experimental group compared to their counterparts in the control group. Qualitative findings highlighted that the mastery experiences gained during the FCM-based course enhanced science-related knowledge and skills, reduced emotional barriers, and provided vicarious experiences that inspired future teaching practices. These results underscore the central role of the FCM in facilitating the application of theoretical concepts to practical science activities, thereby positively influencing PSTs' self-efficacy beliefs. The incorporation of the FCM represents a substantial pedagogical advantage in the training of PSTs, offering valuable support for their professional development.

Keywords: flipped classroom model; preservice teachers; science education; self-efficacy; teacher education.

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DOUBLE LAYER PEDAGOGY AS A WAY OF MAKING CHILDHOOD PRESENT IN TEACHER EDUCATION

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ABSTRACT

This paper focuses on "double layer pedagogy" (Gomes, 2021): teaching approaches used during teacher's education in the contexts of the practicum. It departs from questioning the lack of opportunities to study childhood during the education of primary school teachers and early childhood educators in the context of the current legal framework of teacher education (Gomes & Brito, 2022) and from the conviction that "para aquém e para além de uma educação maior, aquela das políticas, dos ministérios e secretarias, dos gabinetes, há também uma educação menor, da sala de aula, do cotidiano de professores e alunos" (Gallo, 2002, p. 169). Grounded on the work of philosophers of education such as Larrosa (2000) and Kohan (2005), childhood is understood as a category of thought that integrates a chronological age but also an open-ended way of reasoning and of approaching the world. In what concerns methodology, this paper is guided by qualitative approaches and will present preliminary findings of two types of document analysis. The first develops an extensive study as it considers the study plans of Master's degree in Pre-school education and of Pre-School education and Primary School Teaching in a representative group of Higher Education Institutions (HEI) in Portugal, aiming at highlighting the curricular units dedicated to childhood. The second is dedicated to an in-depth preliminary study aiming at analysing examples of students' practicum reports from one of the studied (HEI), from two groups of students of a master programme for the education and primary school teachers and early childhood educators. Preliminary findings show the relevance of a dialogical pedagogy of the practicum for the emergence of student teacher's attention towards childhood. Thus, the paper aims to contribute to the debate around the possibility of rehearsing other ways of relating to teaching in higher education that make it possible to "found a community of researchers instead of a corporation of civil servants and graduates" (Benjamin, 2009, p. 33).

Keywords: Teacher education; Practicum; Higher Education Pedagogy; Childhood.

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FEEDING PRACTICES FOR AUTONOMY/SELF-REGULATION IN CRÈCHE

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ABSTRACT

This research aims to identify eating practices that promote the well-being, autonomy and self-regulation of children and guidelines for the use of healthy and sustainable food in the context of crèche. In crèche, feeding practices are a privileged moment of social interaction and care and play a crucial role, not only in nutrition, but also in the development of motor and social skills, autonomy and self-regulation. This research proposal aims to map the way these practices are organized and justified and to analyze how the quality of feeding practices can influence well-being; the incorporation of instruments by children (e.g., spooning) attending daycare, contributing to the development of these essential skills, such as autonomy and self-regulation. It also aims to investigate the conditions of possibility for improving the quality of food in daycare, which is intended to be healthy and sustainable, based on an interdisciplinary approach that brings together the sociological, psychological, pedagogical, nutritional and motor approaches. The research was carried out in two moments. At first, a questionnaire was constructed that is intended to be applied to a sample of educational agents (e.g., pre-test N ≥30) who perform their functions in the context of crèche (0 -3 years). We will give an account of this process in this presentation. In a second moment, a case study will be developed with documentary analysis, observation of practices at the time of the children's meal (e.g., application of observation grids, scales and checklist) and interviews with educational agents and parents.We intend that this research will result in guidelines for the promotion of well-being, autonomy and self-regulation in the context of crèche as well as for the use of healthy and sustainable food.

Keywords: Well-being; autonomy; feeding practices; early childhood education.

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WALKING FOOTBALL AND QUALITY EDUCATION: INNOVATION FOR SUSTAINABILITY AND LIFE QUALITY – STUDIES WITH CLUSTERS OF ELDERLY PEOPLE

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ABSTRACT

The main objective of this communication is to present data on a new modality that combines the role of lifelong education, sport and active and healthy aging. Walking Football, created in 2011 in England and start in Portugal in 2015 combines the benefits of moderate physical activity with social and cognitive aspects, and it is especially attractive to older people (Jacob et al, 2024). Several studies highlight how this modality serves as an inclusive and impact tool, promoting autonomy, preventing functional decline and increasing overall life quality. Methodology: This is a mixed study with quantitative data collected via an online questionnaire, with a free and informed consent protocol, ethically validated by RUTIS, and collected in person from the sample assisted by the researchers. Participants: elderly people sample: 212 aged 50+, of both genders, living in Portugal and enrolled in walking football. Results: 31 per cent of the athletes hadn't played sport before; 98 per cent of the athletes feel refreshed after playing; 82 per cent feel totally satisfied playing and 17 per cent feel very satisfied. Qualitative data demonstrates growth requires a need for comprehensive attention to life quality and sustainability and demonstrates growing appreciation of walking football in Portugal and the need for training in this sport. Advances in the various areas of innovation and human development and better living conditions will provide a longer-lived society with more global health concerns (Taylor & Pringle, 2021). According Andersson et al. (2023), Chorleton et al. (2021), Rueda and Martinez (2024), In this sense, psychological health plays a crucial role in the life quality by appealing to multidisciplinary approaches contributing to physical and psychological well-being.
Keywords: Walking Football, Life Quality, Education, Elderly.

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THEME 1

Posters

PHYSICAL ACTIVITY AND POSTURAL PROBLEMS IN BASIC SCHOOL CHILDREN: EXPLORATORY STUDY

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ABSTRACT

Postural problems are a common health problem in school-age, potentiated by low level of physical activity (Latalski et al, 2013; Juskeliene et al., 1996). Our objective was to characterize 6-7 years-old school children (N=47, 23 girls) with a qualitative observation of vertebrae alignment (Adams test) and a questionnaire of physical activity (Mercê et al., 2023). Results: Children that do less physical activity outside school also do less at weekend (p=.015) and at organized sports (p=.034). Children that do less physical activity during physical education classes also do less during school recess (p=.02). Fourteen children (29.8%) were identified with problems in vertebrae alignment, with significant association with unevenness of shoulder blades (p<.001) and of iliac (p<.001). The greater the physical activity, the more the cases of vertebrae correct alignment (p=.021). Weight and body mass index had no association with level of physical activity and altered positions of vertebrae, shoulder blades or iliac. Nonetheless, the 2 children with higher body mass index (27.22 and 34.19) revealed vertebrae problems. Only 17% (n=8) went to school walking, none by bicycle. Discussion: In these children, level of individual physical activity is transversal to every moment of their day life. Because an association was found between level of physical activity and adequate vertebrae alignment, those children with lower levels of physical activity may be more susceptible to postural problems. For those children, it seems that physical education is not having impact in physical activities habits; meaning that is necessary to involve parents. Although the criticism to Adams test (e.g., Karachalios et al., 1999), a simplified protocol, based on an qualitative observation may be useful in detecting potential postural problems.
Keywords: postural problems; physical activity; physical education; elementary school; Adams test.

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TODDLER'S SPOON USE AT THE NURSERY: EXPLORATORY STUDY

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ABSTRACT

This study aims to analyse the autonomy provided to toddlers in the use of a dessert spoon, in a nursery context. At 18 months, toddlers fill the spoon, with difficulty in not spilling it, with a preferred hand and grip pattern, involving the other hand as support (Connolly & Dalgleish, 1993). Toddlers that look at the caregiver's hand, are more likely to use the spoon (Nonaka & Stoffregen, 2020). Eleven toddlers (18.18±3.95 months) were observed during the meal. 85.71% of toddlers used the spoon with the left hand, with significant association with functional differentiation of each hand (spoon, container). Adults fed toddlers at a rate of 3.11 (±.57, min 2, max 4) per 15 seconds, while toddlers revealed a pace of 2.67 (±1.37, min 1.5, max 3) (ns). Nine toddlers (81.82%) revealed good synchronization of progressively opening their mouth with the approaching of the spoon. One toddler only explored the spoon with the hands; five (45.45%) placed the food on the spoon with their hands, before taking it to the mouth; six successfully collected, transported and placed food in the mouth, with a significant association with differentiated hands' functions. Ulnar and radial, palmar and phalangeal with thumb opposition grips occurred; none with pulp control. The ulnar phalangeal grip revealed a significant association with spoon exploration. The adults fed the toddlers at a comfortable pace, probably allowing a good perception-action cycle between spoon approaching and mouth opening. Adults were facing the infants, which may explain the predominance of left-hand spoon use by toddlers meaning that a strong spatial extrinsic constraint occurred, resulting in a symmetry between visual perception and unilateral motor action. Putting food on the spoon before taking it to the mouth may be a perceptual-motor phase transition to embody the spoon as an eating tool.

Keywords: spoon use; toddlers; nursery; perception-action cycle; task constraints.

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TYPING PROFICIENCY IN A 3rd GRADE ELEMENTARY SCHOOL CLASS: EXPLORATORY STUDY

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ABSTRACT

Typing can be a solution for handwriting difficulties; but information, as speed, is necessary (Rogers & Case-Smith, 2002; Freeman et al., 2005). To be a complement to handwriting, typing speeds need to be as fast as handwriting (Freeman et al., 2005; Rogers & Case-Smith 2002; Dunn & Reay, 1989). Typing imposes control of pointing and touching the key, and fingers sequencing between keys (Gopher & Raij, 1988); which may involve both hands and cerebral hemispheres (Longcamp et al., 2003, 2005). Our objective was to contribute with information about typing speed and hands use patterns, in a 3rd grade class (N=19; 10 girls; 2 lefthanded; 1 dyslexic- D), compared to cursive writing. Individually, it was asked to children to write the lowercase (LC) and uppercase (UP) alphabet, at a comfortable pace, on a plain A4 sheet of paper, according to protocol of Chambel & Catela (2020); and to type them in a computer, at a comfortable pace, freely using the keys that and how they wanted. Consent was obtained under an institutional protocol. Assent was obtained. Results: Significantly less time occurred in writing cursive LC (4.14±3.06sec per letter-SPL), and significantly more time writing cursive UC (8.14±10.56SPL); without significant difference between typing LC (5.26±2.96SPL) and UC (4.32±3.35SPL). The D was a severe outlier in cursive UC, but not in typing. Fourteen children (74%) used both hands for typing (only left=2); principally and symmetrically with 2 fingers (LC=10; UC=12), being the index the most frequent (right=15; left=16), followed by middle (right=2; left=3) and thumb (right=1; left=1). Discussion: Typing was faster than writing UC letters, and particularly beneficial for D. Typing involved both hands, and more than one finger, with similar frequency. So, in typing, bilaterality naturally emerged, without evident space difficulty constraints for speed, compared to cursive writing; with advantages for the D.

Keywords: typing; cursive writing; elementary school; dyslexia.

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MOTOR ACTIVITIES RELATED TO EATING AT NURSERY: EXPLORATORY STUDY

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ABSTRACT

Introduction: At 36 months, girls already shed very little and use a grip in supination. Appropriating of the spoon requires a long period of contextualized practice, maybe with some precocity of the girls (Gesell et al., 1943). Objective: This study aims to analyse the opportunities provided to toddlers in the access cutlery and hygiene tasks, in a nursery context. By 24 months, the child holds correctly the spoon, but the food still leaks. Methods: Fourteen toddlers (2.36±.48 years) were observed during the meal. The project was submitted to Santarém Polytechnique University ethical committee. Consent was obtained under an institutional protocol. Results: No gender or age differences were found. Before meal, all successfully opened and closed the tap to wash hands, although without access to soap and towel. Adults fed toddlers at a significantly faster rate (2.4±.8 spoons per 15 seconds) than toddlers self-feeding pace (1.68±.24) (p=.021). All toddlers revealed functional differentiation of each hand (dessert spoon, container); collected, transported and placed some food in the mouth, with good synchronization between opening the mouth and approaching of the spoon. Four used the spoon for soup. Palmar radial grip was predominant (64.3%), followed by pupal control (21.4%); and, a radial phalangeal with thumb opposition occurred. No association was found with the adult's helping. At their room, child' spoon and fork were at the make-believe area. Discussion: There is a transition to mature grips (van Roon, van der Kamp, & Steenbergen, 2013), opportunity to freely play with spoon and fork, to fed themselves, and, to explore some hygiene associated motor tasks. There is a conscience that toddlers need to have opportunities to explore and train motor abilities associated with eating and hygiene, but organizational extrinsic constraints may be present, like disposable time for meal per room, as evident in feeding velocity.

Keywords: spoon use; nursery; autonomy; grips; extrinsic constraints.

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THEME 2

Social Determinants and Health Indicators for Quality of Life

THEME 2

Oral communications

CHALLENGES OF SELF-MANAGEMENT IN PREVENTING SECONDARY COMPLICATIONS IN PEOPLE WITH SPINAL CORD INJURY: MIXED SEQUENTIAL STUDY

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ABSTRAT

The considerable impact of secondary complications following spinal cord injury (SCI) leads to high utilization of healthcare services. To prevent such situations, self- management is considered an essential strategy. Tailored self-management programs can be developed by gaining a better understanding of the meaning of self-management and the facilitators and barriers to its implementation from the perspective of people with SCI. Objectives: This study aimed to profile individuals with SCI in terms of functional independence and self-efficacy, and to explore their perspectives on self-management. Additionally, it sought to identify the facilitators and barriers to implementing self- management. Methodology: A mixed sequential explanatory study involved a two-phase approach. The first phase was quantitative, with 54 participants selected through non-probabilistic convenience sampling. Information was collected through self-report measures on functional independence and self-efficacy, and a sociodemographic and clinical questionnaire. The second phase was qualitative, involving eight semi- structured interviews conducted through intentional sampling. The data obtained from these interviews was subjected to an inductive thematic analysis methodology. Results: Based on the correlation between self-efficacy and functional independence, two distinct profiles were identified: *Profile 1* with low self- efficacy and functional independence, and *Profile 2* with high self-efficacy and functional independence The thematic analysis showed the centrality of internal responsibility in the perspective of self- management. Facilitators and barriers identified included financial resources, healthcare professionals and services, internal responsibility, social support, environmental and social factors, functional dependence, and secondary complications. Conclusions: This study provides insights into the perspective and needs of individuals with SCI in terms of self- management. Findings highlight the complexity of self-management and the central role of self-efficacy in behavioural change. The promotion of self-management, tailored to the individual's specific needs, is a fundamental approach to enhance health outcomes for individuals with SCI.

Keywords: Self-management, barrier, mixed study, facilitator, spinal cord injury

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PROFILE OF THE PRIMARY INFORMAL CAREGIVER OF ADULTS WITH STROKE IN PORTUGAL

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ABSTRACT

Introduction: Primary informal caregivers of adults who suffered from Stroke may experience physiological, psychological, social, and economic changes related to the recovery process of the person being cared for (Freytes et al., 2921; Jia et al., 2021; Kokorelias et al., 2020). In Portugal, there is no known systematic data on these caregivers, which can contribute to the analysis of their main characteristics, needs and challenges. Objectives: This study aimed at characterizing the profile of primary informal caregivers of adults who suffered from Stroke. Methodology: A cross-sectional observational study was conducted, integrating a sample of primary informal caregivers. Data were collected throughout a set of self-reported instruments, including a sociodemographic and care characterization questionnaire, the World Health Organization Quality of Life - Bref, the Informal Caregiver Burden Assessment Questionnaire, the General Self-Efficacy Scale, and the modified Rankin Scale. Descriptive and inferential statistics were used for data analysis. Results: The study included 100 participants (Mean age = 59.61), predominantly female (79%), 22% of these had to reduce their working hours and spend 8.67 hours per day providing care. Quality of life (QoL) and burden scores were reasonable (85.08 and 75.51, respectively), and self-efficacy scores were positive (30.80). Higher burden levels were found associated with providing a greater number of care tasks and more hours per day, and greater functional dependence of the person being cared for. Caregivers' QoL was negatively associated with burden levels and time as caregiver and positively associated with their self-efficacy. Conclusions: Different profiles of informal caregiving relate to specific needs. Multidisciplinary teams should assess the caregiver-care recipient dyad, to identify potential vulnerable caregivers, and help them to address existing problems during long periods of care and reinforce measures to increase their levels of self-efficacy and quality of life.

Keywords: Stroke, Primary informal caregiver, Quality of life, Burden, Self-Efficacy

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QUALITY OF LIFE OF EMPLOYEES POLYTECHNIC INSTITUTES OF SANTARÉM, BEJA, LEIRIA, SETÚBAL, AND PORTALEGRE

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ABSTRACT

Introduction: The growing concern with the Quality of Life (QoL) of employees in any institution or company reflects the value individuals place on their social and personal status. Understanding QoL is vital in our society, where people interact to achieve their goals and meet their needs. This study examines the perception of QoL among employees of Portuguese Polytechnic Institutes, highlighting its importance in the workplace. Objectives: The primary goals of this research are to assess the perception of QoL among employees at the Poly- technic Institutes of Santarém, Beja, Leiria, Setúbal, and Portalegre. Additionally, the study seeks to identify the relationship between sociodemographic variables—such as age, gender, and professional category—and employees' perceptions of their QoL. A significant aim is also to develop a digital tool (App) designed for self-assessment and ongoing monitoring of employees' QoL, offering a practical solution for individuals to track their well-being. Methods: This study adopts a quantitative, positivist, and deterministic approach. The population comprises employees from the mentioned Polytechnic Institutes, with a probabilistic sampling method stratified by professional category and institution. It is exploratory, cross-sectional, and descriptive-correlational in nature, using a questionnaire that incorporates both sociodemographic and professional data alongside the World Health Organization Quality of Life (WHOQOL) scale. This comprehensive approach ensures a robust analysis of the factors affecting QoL perceptions. Results and Future Expectations: The study provides a detailed understanding of employees' QoL perceptions at these institutes, which is pivotal for creating a digital self-assessment tool. Moving forward, the research aims to involve focus groups with key institutional stakeholders. These discussions will enrich the quantitative data, of- fering deeper insights into the core aspects of employees' QoL. This comprehensive approach will support the ongoing development of strategies to enhance employee well-being at the Polytechnic Institutes.

Keywords: quality of life; polytechnic higher education employees; environment; physical, psychological and social well-being.

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EVOLUTION OF NURSING STUDENTS' KNOWLEDGE, ATTITUDES, AND PRACTICES IN PEDIATRIC PAIN MANAGEMENT: A LONGITUDINAL STUDY

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ABSTRACT

Objectives: This study aims to evaluate the evolution of nursing students' knowledge, attitudes, and practices regarding pediatric pain management through three observations conducted at distinct moments. The objective is to analyze the impact of educational interventions on the assimilation of theoretical concepts and their practical application. Methods: A longitudinal study was conducted with fourth-year nursing students from the same cohort, assessing their understanding and skills in pediatric pain management at three different time points within a single semester. The moments were before and after the theoretical class and after a clinical practice. Data were collected using questionnaires that covered key topics, including pain physiology, caregiver roles, and the application of pain assessment tools. A total of 75, 66, and 45 students participated across the three observations, with a decrease in response rate over time. However, all participants belonged to the same group. Findings: Results indicate a progressive improvement in students' knowledge and practical application, particularly in recognizing and managing pain using standardized scales (mean: 3.85 to 4.20). Significant improvements were noted in individualizing analgesic dosages (mean: 4.00 to 4.07) and recognizing the importance of non-pharmacological interventions (mean: 3.31 to 3.47). Attitudes evolved, with greater acknowledgment of pain as a multifactorial experience influenced by biological, psychological, and social factors (mean: 4.32 to 4.33). Practical skills in identifying pain in neonates improved (mean: 2.93 to 4.00). However, persistent misconceptions, such as underestimating infants' sensitivity to pain (mean: 2.44 to 2.33) and the role of parental involvement, highlight the need for enhanced educational strategies. Conclusion: The findings emphasize the importance of experiential learning and targeted teaching approaches to address persistent gaps in pediatric pain management. Incorporating both theoretical and practical training into nursing curricula is crucial for equipping students with the competencies needed to deliver effective and compassionate care.

Keywords: Pediatric pain management; Nursing education; Pain assessment; Longitudinal study; Experiential learning.

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ASSOCIATION BETWEEN HAIR CORTISOL AND ATTENTION DEFICIT AND HYPERACTIVITY DISORDER

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ABSTRACT

Attention deficit hyperactivity disorder (ADHD) is the most frequent neurodevelopmental disorder, affecting 5.9%-7.2% of children globally, with significant impacts on academic, emotional, and social. ADHD is characterized by symptoms of inattention, hyperactivity, and impulsivity, often with a familial tendency. Diagnosis is based on clinical criteria defined by the DSM-5, requiring symptoms present in multiple contexts before age 12. Evaluations include parental and teacher reports and tools like the Conners Scale questionnaire. Indeed, treatment typically combines stimulant medications and behavioral interventions tailored to each case. Furthermore, hair cortisol concentration (HCC) has emerged as a stable and reliable biomarker to measure chronic stress, potentially offering insights into ADHD. The objective of this study was to analyse the possible relationship between HCC and ADHD in children and adolescents. Through a bibliographic search in PubMed/MEDLINE 16 studies were identified, eight of which were analysed for relevance and methodological quality. Observational and case-control studies carried out in children and adolescents were included, excluding research in animals and adults. The research was complemented by the analysis of the bibliographic references of the selected articles. The methodology for analysing the scientific articles was based on the objectives, population sample, results and conclusions. Seven studies found a significant association between low HCC and ADHD, in boys, while one study found no significant link. Results found reduced cortisol levels especially in boys with ADHD, but also that early life stress and family difficulties, contribute to the development of ADHD. On the other hand, girls showed more variable results. While promising as a diagnostic tool and treatment aid, more studies are needed to address gaps related to gender differences and environmental contexts.

Keywords: Endocrinology; Hypothalamic-pituitary-adrenal axis; Hair cortisol; Cognitive function; Attention deficit hyperactivity disorder.

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RISK AND QUALITY MANAGEMENT IN PATIENT SAFETY IN AN ENVIRONMENT OF BREAKDOWN INFORMATION SYSTEMS

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ABSTRACT

In the National Health Service there are technological and non-technological contingencies. Technological contingencies are based on plan B (information systems contingency plan), which is essential for dealing with d e- pendency on health information systems. The objectives are to study the implications of computer breakdowns in an emergency department, where these types of breakdown of decision support platforms have more impact. It includes measuring the real conse- quences of a computer breakdown scenario in order to obtain an assessment of the constraints on both patient care and the work of professionals. In order to work on this issue, we used a literature review and a mixed profile study: interviews in the workp lace (qualitative method) and questionnaires (quantitative method). The interviews were key to understanding the main constraints of the unavailability of IT systems from the key informants. The questionnaire enabled us to find out about the difficulties faced by each professional through a sample taken from the emergency department. The conclusion was that the downtime of health information systems can lead to risk and loss of quality of care. The main problems centre on the general delay in service, the lack of communication and training, the logistics of test results or clinical information for decision-making, the rigour required in document retrieval, and the recent problem of computer attacks. It is hoped that the results of the study can be applied in a practical way in health centres that have not yet ad- dressed this issue. The main steps in creating value through application in the workplace will be diagnosing the methods described, understanding the causes and defining a strategy. All these steps refer to the PDCA cycle of redesigning and updating processes, as well as reinforcing the training of professionals**.**

Keywords: Contingency Plan; EHR Downtime; Health Information Systems; Continuity of Healthcare; Communication

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PATIENT-CENTERED COMPREHENSIVE CARE SCORE ON HAEMODIALYSIS PATIENTS

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ABSTRACT

Patient Centered Care (PCC) is established has the way which health professionals select and provide interventions that respond to patient`s individual needs. (Sidani et al., 2018) The Patient-Centered Comprehensive Care (PCCC) score was adapted from the "Patient-Centered Comprehensive Care", subscale developed by van Servellen (1988). It includes 21 items divided into 5 dimensions: (i) meet patient needs (4 items); (ii) resolving patient health problems (3 items); (iii) respond to patient needs according to their preferences (5 items); (iv) patient education (4 items) and (v) patient counselling (5 items). Our objective was to assess PCCC score on haemodialysis patients. A cross-sectional study was performed on 586 patients from 37 dialysis centres. Participants were aged over 18 years old, who started haemodialysis for more than 6 months, were able to read and write Portuguese, without mental disorders and who consented to participate in this study. The PCCC scale adapted by Ferreira and Amendoeira (2020) was administered in haemodialysis units. A total of 565 participants, 36.7% female and with average age of 66.52 (SD = 13.66) years and with 7.27 (SD = 7.56) years on haemodialysis. Most patients (57.1%) have basic skills at school, while 84.1% have retired. The analysis was carried out in fiver dimensions: (A) - meeting patient needs; (B) - problem solving; (C) - respond to customer needs according to their preferences (D) - education (E) - counselling. Patients showed PCCC scores, A = 3.97 (SD=1.13); B=3.39 (SD=1.31); C=3,81 (SD=1,27); D=3,53 (SD=1.59); E=3.46 (SD=1.55). we identified that the age (p<0.010) and education (p<0.001) showed significant different results for the PCCC scores. The development of an intervention model to promote PCC in dialysis patients should consider the individuality of each patient, enabling an individualized approach and define priorities in the approach, considering the different dimensions of the process of PCCC.

Keywords: Patient-Centered Care; Heamodialysis; Nursing

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POST-SURGICAL EFFECTS OF TELEPHYSIOTHERAPY ON QUALITY OF LIFE, FUNCTIONALITY, PAIN, FATIGUE, MOVEMENT FIT- NESS, AND BODY IMAGE IN CANCER PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction: In 2022, around 20 million new cancer cases were diagnosed worldwide, with breast and lung cancer being the most common. Surgical interventions often lead to side effects such as fatigue, pain, muscle weakness, and reduced functionality, significantly affecting daily life and overall well-being. Physiotherapy plays a key role in alleviating these symptoms, promoting recovery, and enhancing patient participation in physical and social activities. However, barriers like frequent visits and financial costs, can limit access to traditional physiotherapy, highlighting the need for more accessible rehabilitation approaches. Telephysiotherapy, has emerged as a flexible alternative, providing personalized care while addressing physical and emotional limitations. By integrating technology into rehabilitation programs, telephysiotherapy allows patients to receive professional guidance at home, reducing travel burdens and associated costs. With the increasing adoption of digital health solutions, its role in cancer rehabilitation is particularly relevant. Objective: To evaluate the effects of telephysiotherapy on quality of life, functionality, pain, fatigue, movement fitness, and body image in post-surgical cancer patients. Methods: A systematic search of PubMed, SciELO, and Scopus included studies published until May 10, 2024. Eligible randomized controlled trials (RCTs) involved post-surgical oncology patients (18+ years) receiving telephysiotherapy, compared to conventional physiotherapy or no intervention. Outcomes analyzed included quality of life, functionality, pain, fatigue, movement fitness, and body image. Only full-text studies in Portuguese or English (2019–2024) were included, following PRISMA guidelines. Results: Four studies with 336 participants met the criteria. Two showed significant quality-of-life improvements, while two reported reduced fatigue. Functionality and pain also improved, though no data were available for movement fitness or body image. Discussion: Despite limited studies, telephysiotherapy appears promising in improving quality of life, functionality, fatigue, and pain. Further research is needed to explore movement fitness and body image outcomes.
Keywords: telephysiotherapy, cancer, quality of life, functionality.

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BARRIERS AND FACILITATORS TO PARTICIPATION IN A PHYSIOTHERAPEUTIC EXERCISE PROGRAM FOR POST-SURGICAL BREAST CANCER PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Objectives: To identify barriers and facilitators to participation in physiotherapeutic exercise programs during the postoperative phase of breast cancer on an outpatient basis, potentially leading to strategies for functional improvement and enhanced adherence levels. Methods: Eligible studies included women in the postoperative phase of breast cancer on an outpatient basis, focusing on barriers and facilitators to participation in physiotherapeutic exercise programs. Observational studies and randomized controlled trials (RCTs) were searched in PubMed, Web of Science, Scopus, PEDro, and SciELO. The selection process followed the PRISMA methodology in multiple stages. Study quality was assessed using the PEDro scale for RCTs and the CASP tool for observational studies. Results: Eight studies were included, comprising six RCTs and two observational studies. Facilitators identified comprise: (i) prior engagement in physical exercise; (ii) a trusting relationship between the physiotherapist and the patient; (iii) motivation to improve well-being and active participation in recovery; (iv) physiotherapist supervision during the program; (v) emotional support provided by the physiotherapist throughout the process. Barriers identified were: (i) shoulder dysfunction-related disability; (ii) high levels of fatigue; (iii) low physical fitness levels; (iv) fear of injury to the affected upper limb, including kinesiophobia; (v) medical complications; (vi) lack of information; (vii) insufficient follow-up; (viii) geographical constraints; (ix) lack of motivation due to exercise difficulty; (x) lymphedema; and (xi) frequency of adjuvant treatments. Discussion: Despite the limited number of included studies, the findings underscore the need for further investigation in this field. The identified factors highlight the importance of considering both intrinsic and extrinsic aspects of health conditions when designing exercise programs. Ideally, physiotherapeutic exercise programs for breast cancer patients should, address the diverse range of barriers and facilitators identified.
Keywords: Cancer; Postoperative; Barriers/Facilitators; Physiotherapeutic Exercise

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RELATIONSHIP BETWEEN LEVEL OF PHYSICAL ACTIVITY, MOTIVATION AND SATISFACTION WITH BODY IMAGE IN ADOLESCENTS

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ABSTRACT

The level of physical activity, motivation to practice it, and satisfaction with body image are essential factors for the well-being of adolescents, significantly influencing their behaviour in relation to physical exercise. In the context of promoting "Innovation and Sustainability for a Quality Future," these elements play a crucial role in fostering healthier lifestyles. The aim of this study was to analyse the relationship between these factors in 113 primary and secondary school students from a public school in the district of Santarém, aged between 14 and 19, 64.6% of whom were male. For data collection, an online questionnaire was applied which included the IPAQ, the QMAD and a scale based on the silhouette technique. The results showed that physical fitness was a positive predictor of physical activity among female students, explaining 13.3 per cent of the variation in activity levels. The introduction of 'social recognition' into the model increased the explanation to 22.8 per cent, but with a negative impact, showing that social pressure can discourage exercise, especially among girls. In addition, 46.9 per cent of participants showed dissatisfaction with their body image due to being overweight, highlighting intrinsic motivation as the main factor associated with adherence to physical exercise. The results underline the importance of promoting a positive body image and reducing the impact of social pressures, favouring intrinsic motivation as a driver for regular exercise. The creation of inclusive environments, centred on the pleasure and well-being provided by physical activity, is fundamental to increasing adolescents' adherence to healthy lifestyles, contributing to their physical and psychological well-being.

Keywords: Adolescence, Body image, Motivation, Physical activity.

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THEME 2

Posters

SLOW BREATHING YOGA TECHNIQUES AND HEART RATE VARIABILITY IN CHILDREN WITH AND WITHOUT AUTISM: BRIEF REPORT

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ABSTRACT

Introduction: Low cardiac parasympathetic activity and decreased heart rate variability (HRV), are characteristics of children with autism spectrum disorder (ASD) (Ming et al, 2005; Thapa et al., 2021). ASD children, able to perform biofeedback diaphragmatic breathing, may benefit of HRV acute effects (Coulter et al., 2024). Objective: To verify if children with ASD revealed enhanced HRV during abdominal and complete yoga breathing techniques. Methods: During 2024, November and December, 2 boys with ASD, aged 8 and 9 years, with yoga practice, and 5 children with typical development (T) (7.8±0.84 years, 1 girl, 4 with yoga practice) performed the following breathing conditions in the supine position: i) normal (N); ii) abdominal (A); iii) complete (C); with breathing frequency (BF, cycles per minute-cpm) collected through direct observation (Catela et al., 2024). Polar V800 was used to obtain mean heart rate (HR) and RMSSD (a HRV measure). Approval of the Santarém Polytechnique University ethical committee (2-2023ESDRM). Results: No significant differences were found between ASD and T; however, for breathing techniques, ASD revealed higher breathing frequency and lower RMSSD. For all sample, C revealed significantly lower BF (11.07±1.76cpm) relative to N (17.38±3.04cpm) (p=.013) and to A (14.38±2.34cpm) (p=.028); and, significantly higher RMSSD (73.43±32.76) relative to N (56.57±33.14) (p=.035) and to A (62.29±31.29) (p=.035). T revealed lower heart rate during A (76.56±13.2) and C (78.18±8.29), than during N (79.64±8.92); but not ASD (90.49±4.92, 89.74±.39, and 89.73±.01, respectively). Discussion: These ASD children were able to execute A and C; however, HR and RMSSD, although acutely enhanced, were in accordance with previous studies (e.g., Ming et al, 2005). The absence of significant differences between T and ASD children, during yoga breathing techniques, sustains the hypothesis of its potential benefits for vital signs and reinforcement of parasympathetic system, even without biofeedback programs (e.g., Coulter et al., 2024).
Keywords: children, autism, yoga, slow breathing techniques, heart rate variability.

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EDUCATION AGENTS LEARNING YOGA'S ABDOMINAL BREATHING, A CITIZEN SCIENCE PROJECT: CASE REPORT

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ABSTRACT

Citizen science affords science democratization, with a more active and deep involvement of the public, with or without scientific training; partnering with researchers to gather, analyse data, and report it (Irwin, 2002); requiring project design, outcomes measurement, engagement of new audiences, and new directions for research (Bonney et al., 2016). The purpose of this project is to promote the preservation of healthier vital signs among education agents, through slow abdominal breathing (AB), and to obtain and analyse data in the acquisition and use of the breathing technique, in personal and professional context. The project design is based on protocols between public Grouping Schools, a Polytechnique University and the Yoga national Federation; with the implementation through certified formations, promoted by the formation center of the partner grouping schools. Breathing technique and frequency collection were made according to Catela et al. (2024). Results: Two certified short duration (3h) courses (teachers, n=19; operational assistants, n=9) were carried out. Data collection was made by the participants, with the support of the researchers. AB frequency (6.9±3.3 cycles per minute) was significantly lower than the usual one (UB) (12.3±5.7) ($p<0.001$); with significant reduction of heart rate frequency (at the end of expiration), from UB (71.2±8.6 beats per minute) to AB (67.3±8.4) ($p<0.001$); and, with a tendency for augmentation of peripheral oxygen saturation ($p=0.052$), from UB (96.2±1.2%) to AB (96.9±0.9). Discussion: Participants acquired the AB, with positive acute results in vital signs. The project afforded the engagement of new audiences (operational assistants) (cf., Pandya, 2012); education agents' collaboration in data collection; discussion with participants of individual outcomes and potential applications at work and in personal life; scientific divulgation; and, reflection for new research directions. In a near future more grouping schools will be added to this project, and continued certified formation short courses will be made available.

Keywords: citizen science; grouping schools' formation center; yoga; teachers; operational assistants.

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REJECTIONS OCCURRENCE RATE DUE TO OSTEOMYELITIS IN A SLAUGHTERHOUSE IN PORTUGAL'S CENTRAL REGION

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ABSTRACT

Osteomyelitis is a systemic infectious disease that can affect humans and animals. It consists of destructive and progressive bone inflammation, in the bone marrow region, cortex, and in some cases, the periosteum. It is characterized by pain, swelling of the surrounding soft tissues, and bone changes. In most cases, it is of bacterial origin, but occasionally it can be caused by viruses and fungi (Mello et al., 2024). Osteomyelitis is the leading cause of total rejection in pigs. Not specifically cited in European Regulation (EC) No. 854/2004 as a reason for total rejection, however, it does state that meat must be declared unfit for consumption if it comes from animals affected by a generalized disease such as septicemia or pyemia EC No. 854/2004 (Silva Pires et al., 2019). The objective of this study was to identify the *post-mortem* rejection occurrence rate due to osteomyelitis in a slaughterhouse in Portugal's central region. Analyses were carried out from January to October 2024, where it was possible to perceive the *post-mortem* rejection rates in cattle, goat, sheep, and pig carcasses. As a result, it was possible to see that of almost 1000 carcasses rejected in the period, 0.1% were cattle and goats, 1.5% were sheep, and 40% were pigs. In Portugal, the health decision regarding positive cases is to reject the entire carcass and its viscera. However, studies report that the risk associated with pork consumption subjected to this procedure is considered minimal. The alternative to cutting up the carcasses would be to partially reject the affected parts. This health decision result has significant impacts on producers and the national economy. The same EC gives member states the possibility of implementing changes to the Health Inspection of Fattening Pigs, provided that the risk analysis guarantees the danger absence to Public Health and Human Health (Silva Pires et al., 2019).

Keywords: pork consumption; public health; infectious disease.

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THE IMPORTANCE OF CLOUD-BASED OPEN-SOURCE SOLUTIONS ON GLUCOSE MONITORING

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ABSTRACT

Technology is transforming the daily lives of societies in various sectors, in health sector in particular, this contribution is game changing. Existing technologies that allow glucose monitoring are essential for patients suffering from diabetes or other pathologies which in the normal functioning of the pancreas is affected. xDrip App and the Nightscout Project, are two technological solutions that have been transforming the paradigm in the CGM (Continuous Glucose Monitoring) and FGM (Flash Glucose Monitoring) market. This paper aims to getter information that sustain the importance of cloud-based open-source solutions on glucose monitoring, not only in disease management and improvement on life quality, as well as sustain that volunteer development of certain technologies are crucial for development of the technologies itself. Through a systematic literature review, using a qualitative research and state of the art analyses, we comprehend that these technologies are the result of the active participation of civil society in the quest to implement technologies that are more geared towards people's concrete needs, rather than technologies that are more focused on the commercial side of this business. The focus on self-determination, the massive contributions of volunteers and accessible technologies such as cloud computing make these developments possible. Finally, we have come to realise that both tools are significantly relevant to their users, with real contributions to improving their quality of life, and how they have leveraged technological developments specific to this sector, forcing commercial competitors in the market to seek innovation for their products.
Keywords: xDrip; Nightscout; CGM; FGM; open source.

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THEME 3

Social Sustainability and Entrepreneurship

THEME 3

Oral communications

PERSPECTIVES OF SECOND-HAND SHOPS IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

The purpose of this study is to investigate the role of second-hand shops in higher education institutions. There are different experiences on the creation of projects that aim to sell second-hand goods, like the one that operates at *Universidade de Évora*, which demonstrates academia's interest in the subject. As sustainable consumption practices gain prominence, it becomes crucial to look at the issue from various perspectives: economic, environmental, educational and socio-cultural. Sustainable consumption and production involve making conscious choices to minimise environmental impact, reduce waste and ensure a better future for our planet. 2nd HandShop at *Instituto Politécnico de Setúbal* can be described as an action towards the accomplishment of Goal 12 of the 2030 Agenda for Sustainable Development. The study aims to understand the motivations behind student involvement in second-hand shops and the implications this project can have at the level of the academic community and the community at large. Fast fashion is the main driver to understand what implications/consequences a second-hand store has and what motivations lead students to join. To understand the phenomenon the data collected resulted from a focus group among students that used the second-hand shop organized in the *Instituto Politécnico de Setúbal* as buyers and students that participated as volunteers. The analysis of the data resulting from the application of the focus group as an essentially qualitative approach involved thematic analysis. It showed the main reasons for the adherence of the students around four main perspectives, but with a stronger economic and socio-cultural focus. The data also allowed us to understand which aspects were most valued by the students, as well as gathering valuable input for the future of this type of initiative.

Keywords: Second-hand Shopping; Sustainable Consumption; Higher Education; Student Behaviour; Circular Economy

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PREDICTING FUTURE BITCOIN PRICE TRENDS: LEVERAGING TIME SERIES ALGORITHMS TO ADDRESS MARKET VOLATILITY

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ABSTRACT

Introduction: Bitcoin is a decentralized digital currency created by Satoshi Nakamoto in a published whitepaper "Bitcoin: A peer-to-peer electronic cash system" (Nakamoto, 2008) that enables online payments directly between parties without intermediaries like banks, reduces transaction costs removing third-party mediation, and protects sellers from fraud and facilitates non-reversible services. However, Bitcoin has the problem of high volatility in the prices, that according to Junwei Chen (2023) the standard deviation of Bitcoin's daily return rate was 3.85%, which is 3.36 times that of the S&P 500. This creates a problem of price oscillation that several researchers tried to solve by addressing the bitcoin price prediction to anticipate price movements (J. Chen, 2023; Z. Chen et al., 2020; McNally et al., 2018; Rathore et al., 2022). Objectives: Use time series-based algorithms to predict bitcoin future prices trends and find future price oscillations. Methods: Facebook Prophet (Taylor & Letham, 2017) was used to develop forecasts by extracting daily, monthly and weekly price oscillations, trained with bitcoin historic prices since 2017 with an hourly granularity until 2025. Findings: The approach allowed to show seasonality prices oscillations, namely uptrends in prices from the end of January until April supported also in the prediction of the prices going up in the year 2025. Nonetheless, our model wasn't assessed using other variables such technical indicators or economic data in the model to enhance predictability and robustness of the predictions.

Keywords: Bitcoin; Volatility; Time Series; Seasonality Trends; Facebook Prophet.

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TIME2ACT@SD: ADVANCING SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION THROUGH INNOVATIVE TOOLS

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ABSTRACT

This paper presents the Time2Act@SD project, an Erasmus+-funded initiative that aims to promote sustainable development (SD) knowledge, skills and behaviour change among higher education (HE) students and educators across Europe. The project takes an innovative, multimodal approach to sustainability education, integrating gamification, digital tools and experiential learning (Loureiro et al., 2024). Key deliverables include a MOOC platform offering courses on environmental, social and economic sustainability, interactive virtual reality games such as 'SDG Quest' (Nisiotis et al., 2024; Piki et al., 2025), and mobile apps promoting practical sustainability competencies. The project also includes international sustainability bootcamps that engage educators and students in real-life applications of SD principles. Results from empirical studies show significant improvements in SD knowledge, attitudes and behaviours among participants (Leal et al., 2024), as well as identified gaps in sustainability education that Time2Act@SD addresses. With open access resources and participation from four universities across Europe, the project contributes to improving sustainability education globally and provides replicable models for transformative learning in higher education. This paper discusses project outcomes, lessons learned and the implications of innovative methods for advancing the SDGs in academia and beyond.

Keywords: Sustainability; Higher Education; Innovative Tools; Education for sustainable development.

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"SUSTAINABILITY UNDER PRESSURE?": THE ROLE OF CORPORATE SOCIAL RESPONSIBILITY IN PROMOTING ORGANIZATIONAL CITIZENSHIP BEHAVIOUR: THE MEDIATING ROLE OF AFFECTIVE COMMITMENT AND THE MODERATING EFFECT OF LABOR INTENSITY

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ABSTRACT

Sustainable development goals (SDGs) bring additional challenges to organizations. As key players in promoting sustainable development, organizations must integrate social, environmental, and economic considerations into their daily activities and business strategies. Encouraging companies to adopt these principles is essential for the success of the 2030 Agenda, but the path forward is often complex (European Commission, 2011; Turker, 2009). Promoting and implementing corporate social responsibility (CSR) practices can help organizations promote organizational citizenship Behaviour (OCB) by fostering affective commitment (AC) among employees. This study explores the relationship between CSR, AC, and OCB, with labor intensity acting as a moderating variable. CSR is proposed to increase AC, which, in turn, enhances OCB. Furthermore, labor intensity is accessed as a factor that can weaken the strength of this mediated relationship, highlighting the challenges associated by high-intensity work environments. A correlational study was conducted with 280 employees from various organizations, using a time-lag survey with three waves over three weeks. The first wave measured CSR (Turker, 2009), the second wave captured AC (Meyer & Allen, 1997) and work intensification (Kubicek et al., 2015), and the third wave measured OCB (Organ, 1997). The variables showed a strong reliability, and data were analyzed through multiple regression using Process for SPSS, specifically Model 7, to test the moderated mediation model. The results show that CSR indirectly influences OCB through AC, but this effect is weakened in environments with high labor intensity. The index of moderated mediation confirmed that labor intensity significantly moderates the AC-OCB link. These findings emphasize the need to consider contextual factors, such as labor intensity, when evaluating the impact of CSR initiatives. For managers, this suggests that while CSR can enhance employee affective commitment and OCB, its efficacy may drop in labor-intensive environments, requiring more custom-made strategies to maintain positive outcomes.

Keywords: Corporate Social Responsibility; Labor Intensity; Affective Commitment; Organizational Citizenship Behaviour

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THE INFLUENCE OF SUSTAINABLE MARKETING CAMPAIGNS ON THE CONSUMER PREFERENCES OF GENERATION Z

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ABSTRACT

Faced with the growing environmental concerns of Generation Z, sustainable marketing has emerged as a decisive factor in business strategies. For Rodrigues (2021), this generation has already started to become more aware of its role in society and knows that by consuming more sustainably it will be making a positive contribution to the environment. The main aim of this exploratory study is to understand the impact of sustainable marketing campaigns on the consumption preferences of Generation Z, made up of people born between 1995 and 2009, by understanding how this audience perceives, evaluates and responds to communication strategies focused on sustainability. The aim of the study is therefore to understand the perceptions of Generation Z consumers about sustainable marketing campaigns, to understand how they impact on their decision to buy sustainable products and to understand how they impact on attracting and retaining customers. After reviewing the literature, a structured questionnaire was developed and applied digitally to Generation Z individuals between the ages of 16 and 27, covering a wide range of sociodemographic profiles, and the answers obtained were statistically analysed using SPSS. The results suggest that sustainable marketing campaigns play a significant role in raising awareness of environmental issues, contributing to more conscious consumption decisions, reflecting an increasingly evident trend in concern for the environment. The study shows that sustainable marketing campaigns have a positive, albeit moderate, impact on consumer perceptions and purchasing decisions. This work thus aims to contribute to the literature on sustainable consumer behaviour, offering insights that will allow marketing strategies to be aligned with the expectations of a generation guided by ethical and environmental values.

Keywords: sustainable marketing campaigns; sustainability; consumer preferences; generation Z.

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SUSTAINABILITY IN THE BEAUTY INDUSTRY: PERCEPTIONS AND CONSUMER BEHAVIOR BY GENERATION Z

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ABSTRACT

The world of cosmetics has been marked by various trends, but also by the preferences of the end consumer. It is essential to analyze the frequency of consumption of cosmetic products and the results that the consumer expects to obtain from their use, in order to detect their interests. This exploratory study analyzes the impact of sustainability on the beauty industry, focusing on the perceptions and consumption behaviors of Generation Z. The research aims to understand the impact of the consumerism of beauty products on Generation Z, to understand how the normalization of the use of chemical substances in the beauty industry creates risks for health and the planet, and to identify ways in which Generation Z is redefining beauty standards. For a better understanding of the topic, a literature review was carried out, which enabled the construction of the data collection element. Based on a quantitative approach, data was collected using structured questionnaires applied to Generation Z individuals aged between 18 and 25 living in Portugal. The questionnaire was administered online using the Google Forms platform and the data collected was statistically analysed using the SPSS platform. The study reveals that the consumption of beauty products has a significant influence on Generation Z and their purchasing decisions. However, there are concerns about the negative impacts of this market on the environment. There is a growing demand for sustainable products, revealing more conscious and informed choices. This work contributes to understanding the role of sustainability in redefining the beauty industry, seeking to respond to the demands of a young public that is increasingly informed and committed to sustainability.

Keywords: beauty industry; sustainability; consumer behaviour; generation z.

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GENERATION Z AND CONSCIENTIOUS CONSUMPTION: A STUDY ON PREFERENCES FOR SUSTAINABLE PRODUCTS

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ABSTRACT

Sustainable consumption began with green consumption, where the green consumer, in addition to considering the price/quality variable, began to add the environmental variable to their choice process because they were concerned about environmental aggression (Portilho, 2005), since sustainable consumption brings about a transformation in consumer behaviour, promoting more conscious choices. This study explores the sustainable consumption preferences and behaviours of Generation Z, seeking to identify the level of knowledge about sustainability and how this knowledge influences Generation Z's opinion on this topic. It also aims to understand the weight that social networks and digital influences have on sustainable consumption for this generation. Using a quantitative approach, an exploratory study was carried out based on structured questionnaires applied to young people from Generation Z, aged between 15 and 27, living in Portugal. The results obtained from a sample of around 100 cases show that the level of knowledge about sustainability plays a decisive role in shaping opinions and attitudes, influencing the practice of conscious consumption. The study also reveals that social networks play a crucial role in disseminating information about sustainability and promoting sustainable products. Pinsky & Kruglianskas (2017) state that companies that adopt sustainable products gain a competitive advantage, attract sustainability-conscious consumers, reduce costs and strengthen their reputation, thus increasing the percentage of loyal customers. Understanding the consumer behaviour of Generation Z is essential for brands to be able to develop current strategies capable of creating relationships with this audience.

Keywords: sustainable products; sustainability; conscientious consumption; Generation Z.

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FOSTERING ENTREPRENEURSHIP EDUCATION IN HIGHER EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The scientific literature shows that the teaching of entrepreneurship notably boosts critical thinking, creativity, initiative, problem-solving, proactivity, responsibility, cooperation, social responsibility, and a balanced mix of ambition, optimism, and realism. They can also foster entrepreneurship by promoting university spin-offs and research collaborations with small organizations. Higher Education Institutions are agents that enhance sustainable development practices, especially in the regions covered, assuming an important role in increasing teaching and entrepreneurial activities, through curricular and extracurricular programs, which promote the empowerment of entrepreneurial skills in students, through the development of skills, attitudes and competencies that can be applied in the creation and innovation of businesses and professional activities. The study aims to carry out a systematic review of the literature on the following theme: the role of higher education in the development of entrepreneurial skills, focusing on students' attitudes, skills and abilities. In this study, the literature search was limited to the Scopus and Web of Science databases. The selection criteria included articles published between 2014 and 2024, in Portuguese, English and Spanish, in a qualitative, quantitative or mixed method, which corresponded to the descriptors "entrepreneurial skills", "entrepreneurial education in higher education", "entrepreneurial mindset". Articles that did not address the topic under analysis in the title or abstract were excluded. The results of the systematic literature review were submitted to content analysis and simple frequency analysis, and were presented through five categories: (i) curricular programs in the area of entrepreneurship: instruments, methodologies and pedagogical practices; (ii) transversal skills integrated in the curriculum; (iii) extracurricular activities; (iv) entrepreneurial culture in higher education; (v) impact of entrepreneurial education on sustainable development. This study contributes to the production of scientific knowledge in the area of entrepreneurial education in higher education, in line with SDGs 4 Quality Education and SDG 8 Decent Work and Economic Growth, since it examines the effect of curricular and extracurricular activities on the entrepreneurial motivation and competences of university students. Strategic and methodological implications of these results are discussed.

Keywords: Entrepreneurship Education; High Education; Entrepreneurial skills; Entrepreneurial mindset.

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THE RELEVANCE OF ENTREPRENEURSHIP IN THE DEVELOPMENT OF THE TERRITORY

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ABSTRACT

Entrepreneurship, increasingly seen as a means of boosting regional development, whether through job creation or innovation, allows the vicious cycle of low-density territories to be reversed. In this study, we chose the Alentejo-Extremadura border region, as it is increasingly a socially depressed region (Reigado, 2013). In a situation of geographical, economic and political periphery, it is a marginal space very distant from national and regional decision-making centers and also from consumer centers (Carrera Hernández, 2013). Given that the relationship between these regions is important for its development as a region, but also for the development of the country to which it belongs, in a context of rapid technological change and globalization of economies, and in which, at the same time, increased importance is given to regions increasing their competitiveness through local characteristics, it is necessary to foster entrepreneurship and innovation in these regions, so that they can exploit synergies resulting from their location. It is therefore understood that "the strategies and actions to be promoted must recognize the territorial specificities with which economic and social actors are struggling, the valorization of local resources, productions and know-how, with a view to internationalization and cooperation on a transnational scale" (Fernandes, Natário & Braga, 2016, p. 3). The study of entrepreneurship on the Alentejo-Extremadura border focused on case studies, which allowed us to analyze the dynamics developed by entrepreneurs in relation to the territory in which they operate. The selected companies are from different sectors, with on the Portuguese side being a large company that is 50 years old, a small company that is 29 years old and a micro-company that is 14 years old. On the Spanish side, there is a small company that is 22 years old, and a micro-company that is 23 years old. In addition to creating jobs, entrepreneurs support the development of social, sports and even economic initiatives that are relevant to the creation of wealth in the territory. While in some cases these initiatives are developed directly by the companies themselves, as an internal social program, in other cases they result from direct support to the community, thus also enhancing its involvement with the environment.

Keywords: entrepreneurship; low-density territories; regional development.

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HUMAN CAPITAL AND EMPLOYEE RETENTION: THE ROLE OF WORK WELL-BEING

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ABSTRACT

In today's environment of heightened volatility, uncertainty, complexity, and ambiguity that defines organizational life (Bennett & Lemoine, 2014), the internal actions planned and implemented by human resource management to develop human capital are crucial (Becker, 1964; Skaggs & Youndt, 2004). These actions aim to provide the workforce with the skills and knowledge necessary to diagnose problems, think creatively, and develop innovative solutions (Renkema et al., 2022; Skaggs & Youndt, 2004) promoting in this way organizational growth and sustainability. Within this context, talent retention is recognized as a significant competitive advantage. Recent research suggests that adopting a strategic approach to human capital management contributes to increasing employee well-being (Li et al., 2024; Van De Voorde et al., 2012) as well as lowering turnover intentions (Boon et al., 2017; Haque, 2021; Kumar, 2022). Based on Signaling Theory (Connelly et al., 2025), this study aimed to examine the role of workplace well-being as a mediating factor explaining the relationship between investment in human capital and employees' intention to leave the organization, considering well-known predictors of employee turnover intention, such as abusive supervision, as control variables. A correlational, cross-sectional study, based on a non-probabilistic convenience sample of 221 employees from various organizations, was conducted. Participants voluntarily took part in an online survey, including measures selected from the literature. Following Helsinki's ethical guidelines, anonymity and confidentiality were assured. The results of multiple regression analyses, using macro Process for SPSS, indicate that employees who perceive their organization as investing in workforce development report higher levels of well-being, which, in turn, supports employee retention. These results validate the proposed model even when the investment in human capital is low, and the effect of abusive leadership is considered. The results are discussed considering the critical role that human capital investment plays in promoting workplace well-being, quality of life and organizational sustainability.

Keywords: human capital; work well-being; turnover intention.

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CREATION OF A MATRIX TO ASSESS THE LEVEL OF SUSTAINABILITY IN AN INNOVATION ECOSYSTEM IN THE SOUTHERN REGION OF BRAZIL

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ABSTRACT

The link between sustainability, quality of life and organisational behaviour is essential for building innovation ecosystems that promote balanced and responsible development. Sustainable practices contribute not only to efficiency and corporate responsibility, but also have a positive impact on the quality of life of internal and external stakeholders, favouring healthier and more inclusive environments. When integrated into organisational behaviour, these practices foster a culture that values collective engagement and commitment to long-term objectives, aligned with the social, economic and environmental pillars of sustainability. This holistic approach strengthens both the competitiveness of organisations and their role in promoting social and environmental well-being. In this context, this research addressed the issue of sustainability in innovation ecosystems in the southern region of Brazil, covering the states of Rio Grande do Sul, Santa Catarina and Paraná, with a special focus on Incubators and Pre-Incubators. These institutions play a crucial role as orientation bases for innovation and technology-orientated businesses. The objective of this research is to analyze the applicability and level of knowledge regarding corporate sustainability within the scope of organizational strategy and management, highlighting its importance for decision-making and achieving sustainable results in the ESG (Environmental, Social, and Governance) context.(ESG) context. The analysis, which was qualitative-quantitative and exploratory-descriptive, investigated the sustainability actions applied and transmitted to stakeholders in business management, as well as the relationship between sustainability and business. Data was collected through a survey of institutions in Rio Grande do Sul, followed by the application of a 14-question questionnaire, distributed via Google Forms. The answers were compiled and analysed in Excel, allowing a heat map to be created. The conclusion is that the link between sustainability, quality of life and organisational behaviour plays an essential role in building more balanced, inclusive and responsible innovation ecosystems.

Keywords: Sustainability; Quality of life; Organisational behaviour; Innovation ecosystems.

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THEME 3

Posters

MODELLING ASSUMPTIONS FOR SUPPLY CHAINS IN PLAUSIBLE CIRCULAR FUTURES

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ABSTRACT

Although there is a broad consensus that moving toward a Circular Economy could promote more sustainable futures, there is little discussion about how supply chains will be structured in different plausible circular future (Lahane et al. 2020; Zhang et al. 2022). This study aims at identifying (1) a set of modelling factors to emulate the alternative configurations for different production supply chains, linked to plausible Circular Economy futures, and (2) the most suitable methodological approach that can capture the complexity of circular systems. Through a literature review on supply chain dynamics, industrial visits and detailed analysis of expected Circular Economy scenarios (Calzolari et al. 2022) the assumptions to develop scientifically rigorous models and analysis, to obtain sound generalizable outcomes, are defined (Framiñan et al. 2024). Specifically, a set of Operational features, that characterize the linear production and processes, and a set of Circularity features, that characterize the supply chain archetype, the circular flows and R-imperatives, are obtained. By combining the modelling factors, it is possible to model and analyse several scenarios where circularity is consistently implemented, but with different degrees of intensity. Specifically, the scenarios characteristics, such as centralization/decentralization of the society, play a fundamental role in shaping the final supply chain archetype. Finally, the combination of analytical models (at the design/allocation level) and simulation (at the operation level) has been identified as the best option to fulfill the modelling requirements for plausible circular supply chains.

Keywords: Circular Futures, Circular Economy, Supply Chain Dynamics, Modelling.

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Acknowledgments

This research was supported by the European Commission, under the project ExPliCit (ref.101086465 HORIZON-MSCA-2021-SE-01-01) and by the University of Catania, Italy, through the PIACERI programme, under the project ISTRICE (ID: 59722022316).

ECONOMIC VALUATION OF INLAND FISHERIES IN PORTUGAL

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ABSTRACT

Inland fisheries represent an economically, socially, and environmentally relevant activity in Portugal, yet their significance remains insufficiently explored in scientific contexts (Lynch et al., 2016). The INFISHERIES.PT project aims to quantify the economic value of this activity, encompassing professional, recreational, and sport fishing modalities. This will involve the analysis of existing data from institutional sources, such as the Institute for Nature Conservation and Forests (ICNF, 2022), the Portuguese Federation of Sport Fishing, and regional associations, complemented by surveys targeting fishers and other stakeholders (Martelo et al., 2021). The methodology will enable the estimation of revenues from professional fishing based on captured quantities and market prices (Gago et al., 2014), while in recreational and sport fishing, expenditure on equipment, travel, and accommodation will serve as key economic indicators (Banha et al., 2023). The project will also estimate the pressure on fish stocks exerted by these different fishing modalities, and all the analyses will be done by comparing the importance of native and non-native species (Anastácio et al., 2019). The anticipated outcomes include the creation of a centralized database, essential for the efficient and sustainable management of inland fisheries. Furthermore, the assessment of the relationship between economic benefits and ecological impacts will contribute to developing strategies that promote aquatic ecosystem sustainability and reinforce the importance of these activities for the quality of life of local communities.

Keywords: aquatic resources; environmental management; exotic species; sustainable economy.

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ECONOMIC VALUATION OF INLAND FISHERIES IN PORTUGAL

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Keywords: aquatic resources; environmental management; exotic species; sustainable economy.

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THEME 4

Physical Activity and Sport

THEME 4

Oral communications

QUALITY OF LIFE OF HIGHER EDUCATION STUDENTS – A STUDY OF SPORT, FITNESS AND HEALTH BACHELOR

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ABSTRACT

The purpose of this study is to characterize the Quality of Life (QoL) of higher education fitness students, to compare it between groups (gender and school year), and to correlated it with age. The participants comprised 177 students of Sports, Fitness and Health bachelor, from the Sports Science School of Rio Maior – Santarém Polytechnic University, in Portugal. The Portuguese validated version of World Health Organization WHOQOL-Bref QoL survey (Vaz-Serra et al., 2006) was completed online. Mean, standard deviation and frequencies were used in descriptive analysis. The normality was verified, and T-test or ANOVA were used to compare groups, and Pearson for correlations. The participants have 19.68±1.89 years old, being 43.8% female and 56.2% male, 46.5% from 1st year, 36.8% from 2nd and 16.8% from 3rd. Results reveal moderate to good levels of QoL. The highest score was in Social Domain (74.01±17.59), and the lowest in Psychological (65.65±15.72). No significant differences were found among the students from different bachelor years, despite the lower results of 3rd group in all domains. Females have significant lower QoL than males in Social Relations and Environment Domains. A very weak negative significant correlation was established between age and Overall QoL and General Health, Psychological and Social Domains, suggesting that QoL decreases with age. The present study reveals higher levels of QoL than other studies with students in other areas of health sciences (Putri et al., 2024), possibly because the students of present study are from sports and fitness area, having higher levels of physical activity (PA). In university students PA was positively correlated with QoL and negatively with age and there were differences between genders regarding intensity and type of PA (Nowak et al., 2019). Further research on factors that could affect QoL among students is needed to help define strategies to improve students' QoL.

Keywords: Fitness students; Higher education; Quality of Life; WHOQOL-Bref

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Funding. Rafael Oliveira is a research member of the CIDESD which was funded by National Funds by FCT – Foundation for Science and Technology under the following project UIDB/04045/2020 (https://doi.org/10.54499/UIDB/04045/2020).

FAMILY MILESTONES OF PORTUGUESE FOOTBALL PLAYERS

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ABSTRACT

Background: The study is aimed to identify the family milestones and general professional indicators of Portuguese football players. Methods: The sample consisted of 84 Portuguese former players (48.8 ± 8.2 years old) with at least 8 years of professional experience, who finished their careers between 1988 and 2018. Quantitative data was collected from a validated semi-structure interview guide suitable for quantifying the sociodemographic profile of former Portuguese football players. Results and discussion: Former Portuguese players had a career of 15.2 ± 3.1 years with more 6.4 ± 2.2 years of youth federated formation. The majority of former players marry (83.3%) and have children during the career (82.2%). The divorce rate is 15%. residential mobility is high (8.1 ± 5.55 years) and is likely to be influenced by the number of clubs represented by former players throughout their career. The professional incomes were considered high or very high compared to the average Portuguese salary. Almost 20% of former players engaged in other activities, often due to investments made during their careers and partnerships with family members, especially spouses. The majority of former players (83.3%) reported no addiction, loss, or dependency throughout their careers. However, 16.7% acknowledged having these negative experiences, highlighting a need for further investigation. Additionally, 4.8% of former players preferred not to disclose their dependency. Conclusion: The results reveals that the football career is brief and presents stress and risk factors, mainly at higher competitive levels. the findings contribute to a better understanding and discussion of the professional careers of former Portuguese football players.

Keywords: football (soccer), former players; professional sports career; post-career; sociodemographic approach.

FACTORS INFLUENCING THE QUALITY OF LIFE OF FORMER FOOTBALL PLAYERS IN POST-CAREER

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ABSTRACT

Background: This study aimed to assess quality of life (Qol) among Portuguese former players according to career duration, career end period, competitive level, tactical-positional status, international status, academic qualifications, serious injuries in career, and current professional football connection. Methods: the study included 84 Portuguese former football players (48.8 ± 8.2 years old) who transitioned to retirement between 1988 and 2018. The whoqol-bref questionnaire was used to assess Qol perceptions, and the Portuguese version was validated. Results and discussion: The former players have positive Qol indicators, both in general and across the four domains, namely in terms of the physical, psychological, social relationship and environment. there were no statistically significant differences in Qol between the defined categories for career end period, competitive level, tactical-positional status, international status, and current professional football connection. Likewise, there was no significant correlation between Qol and career duration. in contrast, there were significant differences in general Qol ($p < 0.023$) and in the physical domain ($p < 0.001$) between former players with different academic qualifications. a significant correlation was found between the number of severe injuries sustained in a career and Qol in the physical domain ($r = -0.300$, $p = 0.006$). Conclusions: There are no concerning Qol results presented by former players. however, the number of severe injuries sustained during the career was associated with a lower Qol, while holding higher academic qualifications demonstrated higher general and physical Qol. Studies with larger samples should be conducted to confirm these trends.

Keywords: Football (Soccer); Post-Career; Former Players; Quality of Life; Health

MAXIMAL BACK SQUAT PROTOCOL CHANGES OXYGEN UPTAKE DURING EACH REPETITION

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ABSTRACT

Coordination and strength skills are key factors to perform technical movements in sports exercise. All exercises related to motor tasks are linked with the prefrontal cortex (PFC) response, as the decision to continue exercising relies on adequate blood flow and oxygen supply for brain function (Herold et al., 2018). Physical activity promote an increased on oxygen consumption in the brain when compared to rest. Resistance training uses different types of load that promote different responses during exercise (Perey et al., 2023). Therefore our study aim was to analyze PFC oxygen consumption during an maximal back squat (BS) protocol (3RM). Nine men (31.2±3.2. years; 76.7±4.1kg; 1.76±1.2cm) performed three repetitions (3RM) until failure in BS. During the protocol the concentration of oxygenated hemoglobin (O2Hb), deoxygenated hemoglobin (HHb), total hemoglobin (tHb), and tissue oxygenation index (TOI) of PFC was measure in all three repetitions. O2Hb increased repetition after repetition (10.21±1.9 vs 14.5±2.3 vs 16.7±2.5 µmol/L; $p<0.05$). HHb increased only in the last repetition (1.02±1.2 vs 1.23±.0.9 vs 2.11±1.2 µmol/L; $p<0.05$) and TOI only in the first repetition (68.37±2.34 vs 66.5±2.65 vs 66.32±1.98 µmol/L; $p<0.05$). The last repetition before failure promoted a greater supply of oxygen in the PFC, which can promote and result in a greater availability of oxygen for physical activity in the medium and long term. A positive aspect for cognition since availability of oxygen is crucial for cognitive processes to be intact.

Keywords: Resistance training; PFC; Strength protocols; Oxygenated hemoglobin

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PREVALENCE OF CHILDHOOD OBESITY AND OVERWEIGHT IN PORTUGAL: HIGHLIGHTING RISK FACTORS

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ABSTRACT

Childhood obesity is a critical global health issue, impacting cardiovascular health and increasing the risk of metabolic syndrome (Salama et al., 2023). In Portugal, 31.6% of children are affected, underscoring the need for effective interventions (Faienza et al., 2020). This study examined the prevalence of overweight and obesity among Portuguese school-aged children, focusing on differences by sex and age. Anthropometric data, including weight, height, and skinfold thickness, were collected from 1564 children aged 6–10 years. BMI and body fat percentage were calculated using standard methods. Significant differences were observed in BMI ($p \leq 0.001$) and body fat percentage ($p \leq 0.001$) across BMI categories. Overweight and obesity were prevalent, affecting 37% of the sample — 40.1% of boys and 33.9% of girls. This study highlights significant sex-based differences in BMI and body fat percentage across categories. The high prevalence of overweight and obesity, particularly among boys, emphasizes the urgent need for prevention and intervention strategies to address this public health concern.

Keywords: Childhood obesity; Body mass index; Public Health

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WHAT INFLUENCES CUSTOMER RETENTION IN FITNESS NEW TECHNOLOGIES

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ABSTRACT

With new trends revealing themselves in the Fitness Industry, after a worldwide pandemic that has made us reflect on the change of priorities in our lives, placing great emphasis on well-being, physical exercise has taken on a new dimension. (WHO Statistics 2022-2024 and annual ACSM surveys 2021 – 2025) Authors have already pointed out in previous studies that new technologies in the sports and fitness sector have improved and facilitated adherence to the practice of exercise and the increased application of new technologies should be understood as a determining factor in influencing the continued adherence of the practitioner. The aim of this present systematic review was to investigate the main variables to consider when analysing influence practitioner retention fitness center. Studies from searches in PubMed, Scopus, Web of Science and databases from 2010 through 2024. A tailored list. of 188 studies were identified. The measures was assessed precisely, after that 7 articles met the inclusion criteria. The results of a longitudinal field study of a technological application are reflected in the type of game elements used. By comparing the commensurable elements, such as counting steps, and the incommensurable elements, which do not depend on the client's performance, social recognition by others, they confirm that the incommensurable elements reinforce the satisfaction of the client's psychological needs and predominantly help to increase intrinsic motivation and reinforce the individual's relationship and behavioural involvement, as well as their loyalty. Once again, as in Classical Fitness, new technologies also apply the Theory of Self-determination, (Ryan & Deci, 2017) and the Theory of Goal Achievement (Cid & Louro, 2010) which once again leads us to look at the main variables to consider when assessing or analysing practitioner retention, motivation, behavioural involvement and loyalty, taking into account the individual's psychological needs, autonomy, competence and relationship.

Keywords: Retention; Customer; Fitness New Technologies

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ACCELEROMETRY COMPARISONS OF THE ENGLISH PREMIER LEAGUE AND FRENCH LIGUE 1 CONSIDERING PLAYING POSITIONS IN ELITE SOCCER

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ABSTRACT

The aims of the study consisted in comparing accelerations and decelerations of different playing positions between English Premier League (EPL) and Ligue 1 (L1). Fifty-eight male professional soccer players were monitored during all league matches (n = 144) across seasons 2020/21 and 2021/22. The absolute and relative number of accelerations (> +3m.s^{-2}) and decelerations (< -3m.s^{-2}) were analysed. The relative number of accelerations and decelerations across all positions was higher with moderate effect sizes in the EPL when compared to L1 ($p < 0.001$, for both). Significant differences were observed in accelerations and decelerations across all playing positions ($p < 0.001$ and $p = 0.001$ respectively, with moderate to very large effect sizes), except for centre forwards (CF) (accelerations $p = 0.40$; ES = 0.16; decelerations $p = 0.97$; ES = 0.01). This study provides valuable insights into the positional acceleration and deceleration differences in the EPL and L1, which should be considered in match running performance evaluations. While confirming higher accelerations and decelerations in the EPL, the unique case of CF challenges current evidence, emphasising the need for a more granular understanding of the positional demands of explosive actions incorporating accelerations and decelerations in elite soccer.
Keywords: Football; accelerations; decelerations; high-intensity actions.

Funding
This work was funded by National Funds by FCT - Foundation for Science and Technology under the following project UIDB/04045/2020 (https://doi.org/10.54499/UIDB/04045/2020).

EXTERNAL LOAD VARIATION FROM PRE-SEASON TO IN-SEASON. A CASE STUDY OF AN ELITE FEMALE PROFESSIONAL SOCCER TEAM

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ABSTRACT

The study aim was to compare the external load during five microcycles (M1-M4 during pre-season and M5 during the in-season) in a female Portuguese first-team soccer team and to describe external load variations between microcycles. Fourteen players participated in the study (age 23.29 ± 3.19 years, weight 59.14 ± 6.87 kg, height 1.66 ± 0.08 m). External load measures included total distance, high-speed running (HSR) distance (≥15 km/h), number of accelerations and decelerations [acceleration 1 (ACC1), >1–2 m/s; acceleration 2 (ACC2), >2–3 m/s; acceleration 3 (ACC3), >3–4 m/s; acceleration 4 (ACC4), >4 m/s] and decelerations [deceleration 1 (DEC1), <1–2 m/s; deceleration 2 (DEC2), <2–3 m/s; deceleration 3 (DEC3), <3–4 m/s; deceleration 4 (DEC4), <4 m/s]. M1 showed higher values of total distance, ACC1, ACC2, ACC3, DEC2, DEC3 and DEC4 than M2 ($p = <0.001$-0.04), although HSR was higher in M2 ($p < 0.001$). M2 showed lower values of HSR, ACC1, DEC1, DEC2, DEC3 than M3 ($p = 0.001$-0.04). M3 reported higher values of total distance, ACC1, ACC2, DEC1, DEC2 than M4 ($p = <0.001$-0.03), while M4 only found higher values of ACC4 and DEC4 than M5 (both, $p=0.01$). The highest values occurred in M3 for most of the external load metrics (except ACC3, ACC4, and DEC4 which were higher in M4). However, during the transition from M4 to M5, only ACC4 and DEC4 decreased with all other measures maintained, thus supporting the notion to maintain similar loading patterns during official competition.
Keywords: acceleration; deceleration; football; high-speed running; women athletes.

Funding: This work was funded by National Funds by FCT - Foundation for Science and Technol- ogy under the following project UIDP/04748/2020 and UIDB/04045/2020 https://doi.org/10.54499/UIDB/04045/2020).

NEUROMUSCULAR FATIGUE ON OPEN WATER SWIMMERS

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ABSTRACT

Background: Open water swimming is a demanding sport that requires athletes to contend with variable environmental conditions such as water temperature, currents, and waves, which can significantly contribute to fatigue. Electromyography (EMG) is a valuable tool for assessing muscle fatigue and activity during swimming, providing insights into the physiological demands placed on swimmers (Puce et al., 2022). **Purpose**: The aim of this study is to verify the effect of the fatigue in open water swimmers. **Methods**: Nine male swimmers (25.4 ± 11.9 years; Average body weight of (75.9 kg ± 9.0), height of (180.7 cm ± 6.7), and wingspan of (185.6 cm ± 10.3). Each swimmer was performed in an open-water lake environment 5x1000 meters at maximum effort. Muscle activity was monitored using surface electromyography on seven muscles along the longitudinal midline, following the SENIAM Project's 2009 guidelines. *Upper Trapezius* (UP), *Latissimus Dorsi* (LD), *Pectoral Major* (PM), *Posterior Deltoid* (PD), *Anterior Deltoid* (AD), *Triceps Brachii* (TB), *Biceps Brachii* (BB). **Results**: All the muscles had a significant decrease on muscular activity except for the PD that had an increase at the end of the test. The muscle PD had a decreased of 60%RMS on the muscular activity since the start till the end, but the PM had an increase of 39%RMS. The only muscle with significant differences was the PM p-value (0,042). UT500 and PD500 have a significant positive correlation ($r = 0.716$, $p = 0.030$), PD500 and BB500 have a strong significant positive correlation ($r = 0.935$, $p = 0.000$), indicating a very strong relationship between these two variables. UT5000 and AD5000 show a significant positive correlation ($r = 0.732$, $p = 0.025$). **Conclusion**: We can conclude that with the appearance of the fatigue, the Pectoral Major and Latissimus Dorsi start to compensate the lower muscular activity on the other muscles.

Keywords: Open Water Swimming, EMG, Fatigue.

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TACTICAL AND TECHNICAL PROFILE ANALYSIS OF SUB-21 KUMITE ATHLETES: A CLUSTER-BASED STUDY

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ABSTRACT

Understanding tactical and technical profiles is crucial for enhancing performance in competitive karate, particularly in kumite. This study aims to classify Sub-21 kumite athletes based on their tactical profiles and scoring patterns using a cluster analysis approach. The sample includes 169 male (-60kg) and 104 female (-50kg) matches from international WKF competitions. Data were collected from 40 matches to analyze the scoring techniques (Yuko, Waza-ari, Ippon, and Projections). Two hierarchical cluster analyses were conducted: one based on points scored (PS) and conceded (PC) to define tactical profiles, and another based on scoring techniques to identify technical patterns. Results revealed five tactical clusters: Cluster 1 (defensive), Cluster 2 (offensive with defensive weaknesses), Cluster 3 (vulnerable), Cluster 4 (predominantly defensive), and Cluster 5 (balanced offensive). Technical analysis identified four clusters, emphasizing Yuko as the most common scoring technique. Findings align with existing literature, underscoring the importance of hand techniques and the strategic use of kicks (geri) in advantageous situations. The study highlights the potential for integrating tactical and technical profiles into training programs, fostering tailored strategies for individual athletes. Future research should explore additional variables, such as guard types and specific body target regions, to refine these classifications.

Keywords: Kumite; Karate; Cluster Analysis; Tactical Profiles; Technical Patterns.

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LATENT PROFILES OF PHYSICAL BEHAVIOUR AND THEIR IMPACT ON PHYSICAL FITNESS AND PHYSICAL FUNCTION OF PORTUGUESE OLDER ADULTS

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ABSTRACT

Background. Patterns of physical activity and sedentary behaviours may differentially impact health outcomes and inform targeted interventions. Objectives. This study aimed to identify latent profiles of physical behaviour in older adults and examine their association with physical fitness and physical function outcomes. Methods. This cross-sectional study included 1,095 participants (765 females) from the Portuguese physical activity and sports monitoring system. Latent profiles of physical behaviour were identified based on the percentage of waking time spent in sedentary behaviour, light physical activity, and moderate-to-vigorous physical activity (MVPA) assessed by accelerometery. Physical fitness was assessed by Senior Fitness Test Battery, and physical function was evaluated through the 12-item Composite Physical Function questionnaire. Associations between the profiles of physical behaviour and physical fitness and physical function outcomes were examined using generalized linear models adjusted for age. Findings. Three profiles were identified: "balanced movers" (most balanced distribution of physical behaviours), "intermediate movers" (slightly more sedentary and less active than "balanced movers"), and "highly sedentary" (sedentary for ~80% of waking time). Balanced movers demonstrated superior physical fitness and physical function compared to the highly sedentary group. Interestingly, intermediate movers, despite having a less optimal activity distribution, performed similarly to balanced movers in most measures. Conclusion. While achieving the recommended levels of MVPA is ideal, our study suggests that older adults can still experience meaningful health benefits even if these guidelines are not fully met. Balancing physical activity with sedentary time throughout the day by reducing sedentary behaviour and engaging in light physical activity provides a practical and realistic alternative. This approach is particularly relevant for older adults who may face barriers to meeting MVPA recommendations, offering a feasible pathway to improve health outcomes and promote well-being.
Keywords: ageing; fitness; profiles, physical activity; sedentary behaviour.

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Funding. This study was supported by the Portuguese Foundation for Science and Technology (FCT) within the Unit I&D 472 (grant number UIDB/00447/2020). Vera Zymbal was supported by the FCT, DOI 10.54499/CEECINST/00036/2021/CP2776/CT0002 (https://doi.org/10.54499/CEECINST/00036/2021/CP2776/CT0002)

ECONOMIC IMPACT AND DISTANCE TO SPORTING EVENTS IN RIO MAIOR

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ABSTRACT

Objectives: The sustainability of sporting events is essential to ensure a quality future. Sporting events are increasingly recognised as an appropriate tool for achieving a wide range of social, political, environmental, sporting and economic objectives (Kim et al., 2017; Zourgani & Ait-Bihi, 2023). The objectives of this study were to determine the direct economic impact generated by spectators during the 17 football matches of the 'Liga Portugal 1' professional competition - Betclic', in the 2023-2024 sports season, in the city of Rio Maior and to determine whether there are differences in the proportion of members among spectators depending on the distance from the venue. Methods: The individuals surveyed were selected from spectators at football matches at the Municipal Stadium of Rio Maior. A total of 1097 valid responses were obtained from the spectators. The majority of spectators lived in Rio Maior (47.7%). 73.2% were not members of any of the clubs playing. The measuring instrument was a questionnaire adapted from the '*EventIMPACT*S' project (UKSport, 2013). Findings: The total spending estimated with 95% confidence showed that the direct economic impact of spectators was 667.435,58€. Statistically significant differences were observed between the proportion of members who were spectators from 100 km away from the venue. It was concluded that the total direct spending by spectators was very relevant to the local economy: 39 260,92€ per match. The distance from which the members come seems to support the determinant of the fans' attachment to the sports team - Social Identity Theory (Wann, 2006), which argues that individuals with a stronger psychological attachment to the team are more likely to engage in behaviours that promote that attachment to the sports team (Wann & Pierce, 2003), in this case travelling a distance of more than 100 km.
Keywords: Economic impact; Football; Professional sport; Spectators; Sporting events.

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HOME-BASED EXERCISE PROGRAM FOR SARCOPENIA: FEASIBILITY STUDY

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ABSTRACT

Sarcopenia, defined as the progressive loss of muscle mass and physical function, is associated with falls, fractures, disability, and mortality in elderly populations. Scientific evidence suggests that physical exercise, particularly aerobic and strength training, can be effective in improving muscle strength and functional mobility, mitigating the effects of this condition. This pre-project aims to assess the feasibility of implementing a home-based exercise program for individuals diagnosed with sarcopenia, aged over 65, and residing in Portugal. The study will be conducted over 12 weeks and will include aerobic training (walking) and strength training (using bodyweight and household items), with weekly telephone supervision. Recruitment will be conducted through health centers, using the SARC-F questionnaire, and all participants will need to meet specific inclusion criteria. The primary objectives of this study include assessing recruitment rate, retention, adherence to the program, and the safety of the intervention. Additionally, muscle mass, strength, and gait speed will also be evaluated.
Keywords: sarcopenia, aerobic exercise, strength training, resistance exercise, home-based training

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STUDY OF COACHES SOCIAL SUPPORT, ACCORDING TO THE LEVEL OF PROFESSIONAL AND ACADEMIC QUALIFICATIONS.

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ABSTRACT

The objective of the present study is to identify the perceived social support and burnout factors in sports coaches (Ferreira et al, 2024), seeking to verify the differences between the groups of coaches, in terms of academic and professional qualifications. We applied the Multidimensional Scale of the Perceived Social Support Questionnaire (MSPSS) and Maslach Burnout Inventory - Educators Survey (MBI-ES). 1816 responses were collected from coaches. The research was approved by the Ethics Committee of the Santarém Polytechnic University. In the statistical analysis we used the IBM SPSS Statistics version 29 program. We performed bivariate correlations to explore the relationships between the study variables. We tested the normality of the data using the Kolmogorov-Smirnov normality test. We compared the groups of coaches, depending on the variables under study, using the Kruskal-Wallis non-parametric test ($p<0.05$). The main results revealed positive and significant correlations between support from "significant others", "family" and "friends" ($r = 0.52 – 0.67$, $p < 0.01$), among the variables of burnout ($r = 0.27 – 0.58$, $p < 0.01$), and between support from "significant others" and "depersonalization". We compared the coaches' qualification groups and found that there were no significant differences in most variables, except for the "depersonalization" variable ($p<0.001$). When we analysed the groups of coaches by academic qualifications, we noted that there were no significant differences in relation to "significant others", "family" and "professional achievement". Regarding the variable's "friends", "emotional exhaustion" and "depersonalization" there are significant differences, respectively (sig = <0.001; sig = 0.044; sig = 0.004). We conclude that professional levels and academic qualifications differentiate groups of coaches in terms of the social support they seek. Coaches with greater qualifications reveal different values than coaches with less qualifications, a fact that we attribute to the complexity of the social networks they establish.

Keywords: social support; coach; qualifications

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PLANNING IN PROFESSIONAL FOOTBALL IN PORTUGAL: METHODOLOGIES AND CHALENGES

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ABSTRACT

Professional football in Portugal has a deep cultural connection, standing out as the country's most prominent sport. However, competitive success heavily relies on the quality of annual planning and organizational strategies, especially in highly competitive leagues. This study aimed to analyze the importance of annual planning in professional football by exploring management and season organization practices. Specifically, it sought to understand who participates in planning, how objectives are defined, and the role of technology in training monitoring. A qualitative approach was employed, utilizing semi-structured interviews with six coaches holding UEFA PRO and UEFA A certifications, representing clubs from portuguese professional leagues. The interviews addressed topics such as planning processes, workload management, goal-setting, and the integration of technological tools. The results highlighted the recognition of annual planning as a critical factor, though practices varied depending on the club context and each coach's philosophy. Technologies such as GPS and RPE were deemed essential, being fundamental for workload management, real-time performance analysis, and injury prevention. However, inconsistencies were noted in goal-setting approaches and the integration of methods during the early stages of training. The study demonstrated that Portuguese professional football combines advanced methodologies with structural challenges, such as coordination between technical staff and club management. The findings emphasize the importance of structured and adaptive planning to enhance performance, prevent injuries, and contribute to the continuous development of the sport in the country.

Keywords: Football, Planning, Performance, Technology, Portugal

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ANNUAL PLANNING OF A FOOTBALL SEASON

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ABSTRACT

Effective planning of a football season is crucial for achieving excellence in a team performance. This process transcends merely organizing training sessions and competitions; it involves a comprehensive strategy addressing the physical, psychological, tactical, and technical preparation of athletes. Tailoring these aspects to individual needs and collective goals ensures optimized performance, efficient workload management, and sustained success throughout the season. This research investigates the annual planning practices adopted by professional football coaches across different competitive divisions. Emphasis is placed on goal setting, structuring training regimens, and implementing injury prevention strategies. Interviews with 3 coaches from the 1st, 2nd, and 3rd leagues shed light on methodologies employed to boost team cohesion and performance. The study underscores the critical role of pre-season planning meetings, alignment between management and coaching staff, and the execution of physical assessments and recovery protocols. Additionally, the integration of adaptable game models and adherence to internal regulations are identified as integral components of effective planning. The findings reveal that meticulous planning facilitates not only the optimization of athletic output but also the mitigation of injury risks, fostering an environment conducive to both individual and team development. The significance of collaboration within the coaching team and the strategic formulation of short- and long-term objectives further highlights the comprehensive nature of successful season planning.

Keywords: Sports planning; Performance; Injury prevention; Team cohesion; Professional football.

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EVOLUTION OF RESEARCH RELATED TO HOW A SEDENTARY LIFESTYLE INFLUENCES THE AGING PROCESS

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ABSTRACT

Background: Sedentary lifestyles have become increasingly prevalent globally due to limited access to exercise facilities, sedentary work environments, and the pervasive use of digital devices (Park et al., 2020). These changes have exacerbated health issues, particularly in older adults, where inactivity accelerates age-related decline (O'Donoghue et al., 2016; Dhuli et al., 2022). Purpose: This study analysed global research trends and characteristics of publications addressing the effects of sedentary behavior on older adults, identifying key contributors, thematic focus, and emerging insights. Methods: A bibliometric analysis of 311 documents from the Web of Science Core Collection (1994–2022) was conducted to track publication trends, leading contributors, and thematic priorities in the scientific field. Results: Since 1997, publications on sedentary behavior and aging have increased by 79%, reflecting a growing recognition of their health implications. The most active journal categories were *Geriatrics & Gerontology* and *Public*, *Environmental & Occupational Health*. Key contributors included S. Amagasa, N. Fukushima, S. Inoue, and H. Kikuchi, with the United States of America leading in publication output. Keyword analysis revealed "aging" and "sedentary lifestyle" as the most cited terms, occurring 97 and 37 times, respectively, which underlines their significance. Discussion: These findings emphasize the rising academic focus on the health risks of sedentary behavior in aging populations. Leading authors and regions of research activity illustrate the global collaboration in addressing these challenges. The identified thematic trends highlight the critical relationship between sedentary lifestyles and broader health outcomes, emphasizing the need for targeted interventions. Conclusion: Addressing sedentary behavior in aging populations requires increased investment in physical activity programs. These initiatives enhance quality of life, improve mental health, and reduce chronic illness risks, promoting healthier aging. This study provides valuable insights into the evolving research landscape and offers a foundation for future strategies targeting sedentary behavior among older adults.
Keywords: Aging; Health; Life quality; Physical activity; Sedentary lifestyle

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ACCESSIBILITY FOR PEOPLE WITH DISABILITIES IN MUNICIPAL SPORTS FACILITIES IN CALDAS DA RAINHA

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ABSTRACT

Objectives: The great challenge of the United Nations Sustainable Development Goal (SDG) No. 10 (United Nations, 2022) commits all governing bodies to two actions: 1) guaranteeing equal opportunities by eliminating discriminatory laws, policies and practices and 2) promoting social inclusion, regardless of age, gender, disability, race, ethnicity, origin, religion or economic status. In the context of sport, accessibility for people with disabilities to sports facilities is essential for eliminating these discriminatory practices, guaranteeing equal opportunities and ensuring social inclusion (Pereira, 2023). The aim of the project is to evaluate the accessibility conditions of two sports facilities: the Rainha D. Leonor Sports Pavilion and the Mata Sports Pavilion, in the municipality of Caldas da Rainha. The aim is to ensure universal accessibility by formulating a well-founded proposal for improving the sports facilities and infrastructure. Methods: The methodology will include the application of an instrument based on the accessibility standards of Decree-Law no. 163/2006 and other instruments already used (Affar et al., 2024; Rimmer et al., 2017; Yi et al., 2022), to assess the level of accessibility of sports facilities, complemented by semi-structured interviews with the facilities manager and the municipality's engineer/architect. These interviews will make it possible to determine the relevance and feasibility of the proposal/solutions presented. Findings: The expected results include a detailed diagnosis of the current conditions of accessibility to sports facilities and the formulation of a proposal for improvement solutions that ensure improved accessibility for people with disabilities. This project stands out for its innovative approach, integrating sustainability into the management and improvement of sports facilities, aligning 1) the municipality's commitment to a quality future, promoting good practices, 2) existing legal standards, and 2) the UN SDGs for a more inclusive world.
Keywords: Accessibility; Inclusion; Sports facilities; Sustainability.

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LEVELS OF ANXIETY, DEPRESSION AND STRESS OF HIGHER EDUCATION STUDENTS – A STUDY OF SPORT, FITNESS AND HEALTH BACHELOR

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ABSTRACT

Mental disorders can lead to several problems, and, in youth, suicide is the first cause of death (World Health Organization, 2022). Considering the importance of this theme, this study aims to characterise anxiety, depression and stress levels of higher education fitness students, compare it between groups (gender and school year), and correlate it with age. 176 Sports, Fitness and Health bachelor students, from the Sports Science School of Rio Maior, Polytechnic University of Santarém - Portugal, participated in this study, with a mean age of 19.6±1.9 years old, being 42.6% female and 57.4% male, 47.2% from 1st year, 35.8% from 2nd and 17% from 3rd. The participants completed the Depression Anxiety Stress Scale-21 (DASS-21) online, which was translated and adapted for the Portuguese population by Pais-Ribeiro et al. (2004). Normality was verified, T-test or ANOVA was used to compare groups and the Pearson test for correlations. The results show mild levels of anxiety (8.8±9.3) and depression (10.0±9.2) and normal levels of stress (12±9.9). When comparing groups, female students had significantly highest levels of anxiety (female 13.5±10.3; male 5.3±6.6; p= .01), depression (female 12.8±10.2; male 7.9±7.8 p= .01), and stress (female 17.1±9.7; male 8.3±8.1 p= .01), with a large effect size in anxiety and stress and a moderate effect size in depression. There were no differences in anxiety, depression and stress levels considering student's school year. Pearson's correlation shows a positive significant association between age and anxiety levels. The findings of this study indicate normal stress levels, while anxiety and depression levels are above normal. However, the high standard deviation reveals considerable dispersion, which should be taken into account. The significantly higher levels of depression, anxiety, and stress observed in females, along with the positive correlation with age, raise concerns and highlight the need for future studies to explore the underlying reasons for these differences.

Keywords: Higher education students; Mental health; Anxiety; Depression; Stress.

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Funding: Rafael Oliveira is a research member of the CIDESD which was funded by National Funds by FCT – Foundation for Science and Technology under the following project UIDB/04045/2020 (https://doi.org/10.54499/UIDB/04045/2020).

MOTIVATION, PHYSICAL ACTIVITY AND HAPPINESS: A STUDY IN ADOLESCENTS

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ABSTRACT

The promotion of healthy lifestyles during adolescence has received attention because of the role physical activity can play in preventing diseases associated with a sedentary lifestyle. Mental health benefits have also been reported, in particular the effect of physical activity on people's happiness. However, the demotivation and lower levels of physical activity associated with adolescence can be problematic. This study aims to investigate the motives that lead adolescents to be active, their level of physical activity and the relationship between physical activity and happiness across them. To achieve this purpose, 83 Portuguese students fill out the following questionnaires: Participation Motivation Questionnaire, International Physical Activity Questionnaire and Subjective Happiness Scale. Higher physical level and motivation by pleasure and body fitness were found in boys and younger subjects, yet the last ones have lower levels of happiness. Motivation related to status seems to influence positively the level of exercise. These findings show that the individual characteristics may be a critical aspect to healthier and happier lifestyles.

Keywords: happiness; gender; adolescents; physical activity; psychology.

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TACTICAL AND TECHNICAL PROFILE ANALYSIS OF SUB-21 KUMITE ATHLETES: A CLUSTER-BASED STUDY

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ABSTRACT

Understanding tactical and technical profiles is crucial for enhancing performance in competitive karate, particularly in kumite. This study aims to classify Sub-21 kumite athletes based on their tactical profiles and scoring patterns using a cluster analysis approach. The sample includes 169 male (-60kg) and 104 female (-50kg) matches from international WKF competitions. Data were collected from 40 matches to analyze the scoring techniques (Yuko, Waza-ari, Ippon, and Projections). Two hierarchical cluster analyses were conducted: one based on points scored (PS) and conceded (PC) to define tactical profiles, and another based on scoring techniques to identify technical patterns. Results revealed five tactical clusters: Cluster 1 (defensive), Cluster 2 (offensive with defensive weaknesses), Cluster 3 (vulnerable), Cluster 4 (predominantly defensive), and Cluster 5 (balanced offensive). Technical analysis identified four clusters, emphasizing Yuko as the most common scoring technique. Findings align with existing literature, underscoring the importance of hand techniques and the strategic use of kicks (geri) in advantageous situations. The study highlights the potential for integrating tactical and technical profiles into training programs, fostering tailored strategies for individual athletes. Future research should explore additional variables, such as guard types and specific body target regions, to refine these classifications.

Keywords: Kumite; Karate; Cluster Analysis; Tactical Profiles; Technical Patterns.

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PHYSICAL ACTIVITY LEVELS AND SEDENTARY TIME OF HIGHER EDUCATION STUDENTS – A STUDY OF SPORT, FITNESS AND HEALTH BACHELOR

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ABSTRACT

Being physically active improves health and quality of life (World Health Organization, 2020). This study aims to assess the Physical Activity (PA) levels and Sedentary Time (ST) of higher education fitness students; to compare these levels across different groups (gender, academic year, and participation in federated sports), and to examine their correlation with age. A total of 176 bachelor's students (19.6±1.9 years) in Sports, Fitness, and Health from the Santarém Polytechnic University, School of Sport, Portugal, participated in the study and responded online to the Internacional Physical Activity Questionnaire (IPAQ). There were 42.6% female and 57.4% male, distributed as 47.2% in the 1st year, 35.8% in the 2nd year, and 17% in the 3rd year participants. Sixty-three percent of the students participated in federated sports. Regarding PA levels, the results show that 4% were considered inactive, 29.5% minimally active and 66.5% health-enhancing PA. The mean of the metabolic equivalent of task (MET) was 8561.4±14136.4 METs-min/week and the ST (seated) was a mean of 37±22.1 hours for a week. Regarding comparisons, there were no differences in gender and participation in federated sports regarding PA METs and ST. Regarding academic year, there were no differences in PA METs, but there were significant differences in ST (p=.01) between the 1st year, with a mean time seated for a week of 32.9±26.1 hours, and the 3rd year, of 46.2±18.7 hours. Regarding the correlations with age, there were no significant correlations between PA METs (p=.6) and ST (p=.65) although the Person´s correlation shows a little decrease of PA METs with age (R=.04) and a little improvement in ST with age (R=-.04). In conclusion, this study showed that ST increases in the 3rd year while the MET kept the HEPA levels. Future research should consider the inclusion of other fitness and health (e.g., anxiety, depression and stress) variables to analyse if there are any negative consequences of the increasing ST.

Keywords: Higher education students; Fitness students; Physical activity levels; Sedentary time; IPAQ

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Funding: Rafael Oliveira is a research member of the CIDESD which was funded by National Funds by FCT – Foundation for Science and Technology under the following project UIDB/04045/2020 (https://doi.org/10.54499/UIDB/04045/2020).

THE ANALYSIS OF PERFORMANCE AND GENDER PARTICIPATION IN FOUR INTERNATIONAL BOCCIA EVENTS

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ABSTRACT

Boccia is an attractive and growing adapted sport, improves well-being and favors the inclusion of individuals in society. For approximately 30 years, this parasport was played together by male and female athletes, fact that recently changed, to our best knowledge, without scientific support. Very little research has reported scientific evidence related to Boccia athletes, one of the recent conclusions was that there is a great space and need for further research, particularly regarding "*Coaching Science*", to improve training conditions and optimize sports performance (Ferreira et al., 2023). Hence, this study aimed to analyse the relationship between performance and gender participation in four Boccia international events. For data collection, four specific international-level Boccia events between 2012 and 2018 were selected as partials were available in the official competition websites and worldboccia.com (2.708 partials, which represent a total of 32.496 ball throw). We found that partials won by male athletes systematically increased between 2012 and 2018 but tend to stabilize between 2017 and 2018, contrary to female, with a growing trend from 2016 onwards. No differences were observed considering the players´ gender and the type of partials (adjusted, balanced and unbalanced) in BC1, BC2, and BC3. In BC4 differences were found, but with low association level (Cramer's Phi coefficient of 0.114). The results emphasize that based on performance, both men and woman can play Boccia together. Although, if the focus of separating genders in Boccia is toward growing and effective female participation and equal success and reward opportunities, this study highlights as a good perspective aiming regular practice of physical activity, exercise and sport in people with disabilities, promoting their quality of life.

Keywords: Adapted sports; Human behavior; Equity; Inclusion; Male; Female.

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YOGA PRACTICE IN MENTAL HEALTH – AN INNOVATIVE LOW-COST SOLUTION FOR THE PORTUGUESE AIRFORCE

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ABSTRACT

Background: Military aviation demands cognitive performance, emotional stability, and resilience under pressure (1). Yoga's capacity to reduce stress and enhance mindfulness makes it a promising intervention for aviation pilots (2). Despite these potential benefits, research on yoga's impact in military aviation remains limited. Purpose: This study investigates the incorporation of yoga into the training regimen of Portuguese military pilots for enhancing mindfulness, reducing stress and improving mental health. Methods: A randomized controlled trial with Portuguese Airforce pilots had the Control Group (n = 8), follow standard military aviation training, and the Intervention Group (n = 10), receive additional yoga training twice a week for 12 weeks. Cognitive/performance assessments included: Five Facet Mindfulness Questionnaire (3); Multidimensional Assessment of Interoceptive Awareness (4); Aviation Safety Attitude Scale (5); Risk Perception To Self (6); Trail Making Test (7). Data analysis used Jamovi v2.6.13. Results: Significant changes were found in FFMQ (Aware Actions and Non-Judgmental Inner Critic), MAIA (Noticing, Attention Regulation, and Body Listening), ASAS (Self-Confidence, Risk Orientation, and Safety Orientation) and TMT (B) within the yoga group. Discussion: Significant improvements in mindfulness (FFMQ) and interoceptive awareness (MAIA) suggest that yoga fosters better self-regulation and stress management (8). Enhanced cognitive flexibility (TMTB) performance, highlights yoga's potential to bolster decision-making under pressure. Gains in safety-related attitudes paired with risk-related attitudes (ASAS) underscore yoga's role in promoting calculated-risk confident behaviour, critical for operational safety. Implementing yoga programs could yield widespread benefits, including better mental health among aviation pilots. Conclusion: This research offers a unique contribution: studying the hard-to-access population of military aviation pilots, due to security and workload constraints. Results could influence policymakers to implement mandatory exercise programs, enhancing work safety, with low cost and minimally time-consuming interventions. These insights are also applicable to Airforce teams in other nations, commercial and civil aviation sectors, as well as high stress/high-performance sports.

Keywords: Mindfulness; occupational health; ashtanga vinyasa yoga; military health; exercise program.

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SWIMMING ENTRY TIMES AND BEST PERFORMANCES IN MEN'S 50 AND 100 M FREESTYLE IN WORLD CHAMPIONSHIPS BETWEEN 2019 AND 2024

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ABSTRACT

In world-class swimming competitions, entry times (et) are currently one of the most important indicators that coaches and swimmers pay attention. It is a way to know the ability of their opponents and, if necessary, adjust competition strategies (santos et al., 2023). This study aimed to analyze the male's et and best performances (bp) in the 50 and 100m freestyle (fr) events and compare those between four editions of world championships (wc). Only swimmers with b qualifying standards in both events were considered resulting in 398 individual performances to be considered among the four wc editions (50 fr, n = 204; 100 fr, n = 194). The data was retrieved from the official open-access websites of omega and fina/world aquatics. a paired sample t-test was used to compare et and bp according to the four wc and the cohen's d was selected as the standardized effect size (es). A one-way anova was used to verify the time effect and the eta squared (η^2) was selected as an es measure. No differences were found when analysing the effect of time across the four wc in men's 50 and 100m fr (p>0.05, η^2 <0.04, in all cases). When comparing the et and the bp values in the four wc, the bp was higher (slower swimming time) than et. the bp consistently improved from 2019 to 2024 in both 50 and 100 m fr, contrary to the et. the findings of this study suggest that coaches and swimmers should consider specific strategies for international-level events qualification since our findings highlight that bp were slower compared to et. Moreover, race strategy for performance enhancement during wc competitions should be considered by coaches and swimmers.

Keywords: Swimming, sprint, performances, analysis, race.

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ACUTE EFFECTS OF ISOMETRIC CONTRACTIONS TO FATIGUE ON PEAK TORQUE, POWER, AND WORK IN LEG EXTENSION

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ABSTRACT

Isometric contractions involve muscle tension without movement[1,2] by sustaining muscle activation, which can lead to rapid exhaustion and reduced force production over time[3]. This study aimed to evaluate the acute effects of isometric contractions on peak torque, power, and work pre- and post-fatigue, assessed in concentric contractions in an isokinetic leg extension. Seventeen active collegiates (21 ± 2 years, 175 ± 9 cm, 70 ± 9 kg, 20 ± 7 % body fat, 23 ± 2 kg/m2) performed two concentric strength assessments of knee extensors and flexors using a Humac NORM (Computer Sports Medicine, Inc. Massachusetts, USA) isokinetic dynamometer. Peak torque, power, and work were assessed with two sets at 180 and 60°/s, each with 12 concentric repetitions pre- and post- fatigue protocol. The isometric fatigue protocol consisted of 3 sets at 80% 1RM, holding the weight for the maxi- mum time at maximum extension in the leg extension machine, with a 2-minute rest between sets. Statistical analysis included the Shapiro-Wilk test for normality and paired samples T-tests for significant differences ($p < 0.05$). Effect size was calculated using Hedge's g. Significant differences between pre- and post-fatigue protocol were found in power for the left leg extensors ($p < 0.05$; $g = 0.50$) and flexors ($p < 0.001$; $g = 0.99$) and right leg extensors ($p = 0.03$; $g = 0.56$) and flexors ($p < 0.05$; $g = 0.50$). Significant differences in work were observed at 180º/s for left leg extensors ($p < 0.01$; $g = 0.77$) and flexors ($p = 0.01$; $g = 0.67$), right leg extensors ($p = 0.02$; $g = 0.61$) and flexors ($p < 0.05$; $g = 0.50$), and right leg extensors at 60º/s ($p = 0.03$; $g = 0.55$). Isometric contractions until fatigue in the leg extension exercise acutely affect dynamic force production capacities (power and work).

Keywords: Resistance Training; Performance; Peak Torque; Power; Work.

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EFFECTS OF A 16-WEEK HIGH-SPEED RESISTANCE TRAINING PROGRAM ON ISOKINETIC MUSCLE STRENGTH PARAMETERS IN OLDER ADULTS

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ABSTRACT

Objectives: This study investigated the effects of a 16-week high-speed resistance training program on isokinetic muscle strength parameters. Methods: Seventy-nine independent older adults, who were divided into an intervention group (IG, N=40, age: 68.5 ± 3.5 years) and a control group (CG, N=39, age: 72.1±5.9 years) participated in the study. The program lasted 16 weeks, with three sessions per week with 50–60min. Each session being comprised of five-six exercises, two-three sets, and six–ten reps/exercise. Intensity increased progressively based on movement velocity (>1.3 to 0.75 m/s), representing approximately 20% to 65% of one repetition maximum. All exercises were performed as fast as possible over the concentric phase, monitored through BEAST™ sensors, followed by a controlled 2–3 second eccentric phase. The CG maintained daily activities, tracked by the IPAQ Questionnaire. Bilateral isokinetic strength of the knee extensors and flexors at 60˚/s and 180˚/s was assessed pre- and post-intervention using the Biodex© 3 dynamometer. Results: After the intervention, ANCOVA results showed significant improvements in favor of IG in peak torque for extension on the dominant (p<0.001; η^2_p=0.215) and non-dominant side (p<0.001; η^2_p=0.290) and for flexion on the dominant (p<0.001; η^2_p=0.290) and non-dominant side (p=0.002; η^2_p=0.125). Similarly, significant enhancements in favor of IG were found in average muscle power for extension on the dominant (p<0.001; η^2_p=0.328) and non-dominant side (p<0.001; η^2_p=0.298) and for flexion dominant (p<0.001; η^2_p=0.284) and non-dominant side (p=0.005; η^2_p=0.100). Conclusion: This study demonstrates the HSRT program's potential to significantly enhance muscle strength and power in older adults. Additionally, these findings underscore the importance of integrating HSRT into clinical practice, with individualized prescriptions and real-time feedback for improving engagement in exercise interventions.

Keywords: Strength training; Velocity-based training; Aged; Muscle Contraction; Dynamometer.

Funding

This work was funded by the Portuguese Foundation for Science and Technology, I.P.,Grant/Award Number 2021.04598. BD (https://doi.org/10.54499/2021.04598.BD), UIDP/04748/2020 (https://doi.org/10.54499/UIDP/04748/2020), and UIDB/04045/2020 (https://doi.org/10.54499/UIDB/04045/2020).

THEME 4

Posters

THE EFFECT OF PADEL TRAINING ON UPPER LIMB STRENGTH PERFORMANCE IN YOUNG PLAYERS

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ABSTRACT

This study aimed to compare the effect of 8-week padel training (PD) on strength and power in the upper and lower limbs in untrained healthy young boys. Twelve children aged 11–15 (mean SD: 13.00 1.20 years; height 1.62±0.04 meters; body mass 57.25±7.28 kg, and BMI 21.63±2.12(kg/m2) trained twice weekly for 8 weeks. Countermovement jump (Pretraining: 26.78±5.45cm and Post training: 26.22±4.99; Mean difference 95% Lower Limit- Upper Limit: -0.36± 1.89) and 5-m sprint (Pretraining: 2.10±0.33 seconds and Post training: 1.95±0.26 seconds; Mean difference 95% Lower Limit-Upper Limit: -0.06± 0.28) were measured at baseline and after intervention. After 8 weeks of training, no significant results were observed for both measures, countermovement jump (p=0.162) and speed in 5 meters (p=0.195) (Pereira, et al., 2014). Nevertheless, for 8 weeks we observed clear improvements from pre- to post-training in the sprint test by 5%. In each padel match, players need to produce elevated muscular and strength performance in the lower limbs with an optimal response to fast movements in different directions and speeds (Fernandez-Fernandez, et al., 2019). Besides, the present study suggests that a good performance in the practice of padel could be a good strategy for improving fitness performance in lower strength, especially with the development of the technical skill of jumping, teachers and coaches must care about the training of this technical performance because is a good predictor of muscular strength in lower limbs. Padel practice could be considered an alternative to traditional sports to improve body fitness in young children and should be applied in school-based programs and the sports club community.

Keywords: Pade, young, male, strength, power.

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DESIGN OF A TOOL FOR GOAL TYPOLOGY ANALYSIS IN PROFESSIONAL FOOTBALL

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ABSTRACT

In football, analysing the load to which the athletes are exposed allows for the identification of the peaks of maximum performance, as well as the situations of maximum physical demand (Hernández-Beltrán et al., 2024), which are normally associated to goal. The cycle of play in football refers to the continuous and dynamic process in which a team goes through the four main phases of the game: organised attack, organised defence, offensive transition and defensive transition, offensive transition and defensive transition. Therefore, the aim of this study was to design a tool to analyse the typology of the goal according to the different phases and cycles of play that occur in professional football. The instrument used consists of the following variables as the main items of analysis: typology style, stealing zone, stealing positioning, number of passes, number of defenders, number of defenders, time in transition, type of passing, passing surface of finish, number of contacts and finishing zone. This tool will allow us to know the complete sequence of the goal, as well as its typology. In addition, it will allow us to know the behaviour of the teams during defence and attack situations, as well as to analyse their behaviour when losing and recovering the ball. therefore, the analysis of these variables will allow us to know the sequence in attack, and to identify the sequence used by the team to score a goal. This analysis will allow us to know the strengths and weaknesses of the teams in the different attacking and defending situations.

Keywords: Goal, tipology, team, successful, analysis, performance.

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INJURIES ANALYSIS IN PROFESSIONAL FOOTBALL PLAYERS

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ABSTRACT

Football is recognized as a highly physically demanding sport. With the increasing load and intensity of training processes, the number of player injuries has also risen, and recently, Barguerias-Martínez et al. (2023) indicated that football coaching staff should pay special attention to the regular monitoring of young players' development to balance and adapt training interventions to individual needs. High-intensity ball striking and running activities are likely the main causes of muscle and groin injuries. In contrast, dueling for the ball is often the primary cause of ankle injuries, with the lower limbs experiencing the highest incidence of injuries. The main objective of this study was to assess how the players' category and position influence sports injuries. the dependent variables analyzed were the category and playing position, while the independent variables included the body part injured, tissue affected, side affected, and occurrence of injury. The results indicated that the number of injuries increases as the category of players rises. However, no significant differences were found based on the dependent variables analyzed. Given the impact of injuries on both individual and overall, team performance, it is recommended that individualized training programs be implemented to focus on injury prevention.
Keywords: Soccer, Performance, Injuries, Prevention, Match, Training

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PROGRESSION AND VARIABILITY OF MEN'S 800 AND 1500M FREESTYLE PERFORMANCE THROUGHOUT FOUR WORLD CHAMPIONSHIPS EDITIONS

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ABSTRACT

In swimming, most training plans are designed to excel in a single competition or a group of competitions (Mujika et al., 2002). This study aimed to analyse the progression and variability of swimming performance in the 800 and 1500m men's freestyle (FR) events in the last four editions of FINA/World Aquatics World Championships (WC). Entry times (ET) and best performances (BP) of swimmers who qualified with FINA/World Aquatics b standards (800m, n=128; 1500m, n=107) to Guangzhou 2019 (WC1), Budapest 2022 (WC2), Fukuoka 2023 (WC3) and Doha 2024 (WC4) were retrieved from the official open-access website of OMEGA. A paired sample T-test was used to compare ET and BP within the four WC and Cohen's d was selected as the standardized effect size (ES). A one-way ANOVA was used to verify the progression between competitions of the time effect and the eta squared (η^2) was selected as ES measure. No differences were found when analysing the effect of time across the four WC in ET and BP for both swimming events (p>0.05, η^2 <0.04). When comparing ET and BP values at each WC in all editions and swimming distances, the ET was lower compared to BP (i.e., faster swimming performance). However, ET and BP were similar in WC3 (p=0.082) for FR800 and WC2 (p=0.112) and WC3 (p=0.162) for FR1500. The ET of FR800 systematically improved from 2019 to 2024, but this was not observed considering the FR1500, with stabilization from WC2 to WC4. Considering the BP, no consistent improvement was found throughout the WC editions in both long-distance events. These findings suggest that coaches and swimmers should consider specific strategies when training for the FR800 and FR1500m, aiming to guarantee presence in WC swimming events, since BP were always slower compared to ET.

Keywords: World championships; Long-distance; Swimming Analysis; Competition.

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STRENGHT PROFILE COMPARISON BETWEEN FASTER AND SLOWER SUP PRACTITIONERS

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ABSTRACT

Stand Up Paddle (SUP) is a rapidly growing sport requiring balance, strength, and endurance (Schram et al., 2016; Castañeda-Babarro et al., 2022). Despite the increasing number of practitioners (Hibbert et al., 2023), research exploring the relationship between these motor skills remains limited. This study aimed to investigate the relationship between muscle strength and speed in SUP practitioners. Six recreational male paddlers (age: 22.5 ± 7.31 years; height: 1.74 ± 0.035 m; weight: 75.87 ± 20.49 kg; wingspan: 1.83 ± 0.091 m) completed three SUP trials on water at a self-selected pace with 2 minutes rest, covering a total distance of 195 meters. Muscle strength was assessed using the MicroFET 2™ before and after the SUP test, measuring isometric torque during shoulder flexion, abduction, extension, external and internal rotation, elbow flexion and extension, and wrist extension. The device and evaluator were strategically positioned to ensure reliable measurements. Participants were divided into two groups based on their average speed: the three fastest (1.36 m/s ± 0.09) and the three slowest (1.0 m/s ± 0.06). Statistical analysis involved Shapiro-Wilk tests to assess normality. Paired t-tests were applied for normally distributed variables to compare pre- and post-exercise measurements for $p<0.05$. The analysis revealed that faster athletes consistently demonstrate higher muscle strength, particularly in right shoulder flexion. For example, the fastest group averaged 288.70 ± 51.52 N, compared to 208.63 ± 42.64 N for the slowest group, a difference of 80.07 N. Statistical analysis confirmed this difference as significant ($p = 0.015$; $d = 1.69$). These findings highlight a strong relationship between muscle strength and speed in SUP. Faster athletes exhibited significantly higher strength levels, especially in the shoulders, suggesting that muscle strength is a determinant of performance in this sport. Incorporating shoulder-focused strength training could be a practical strategy to enhance performance in SUP.

Keywords: Stand Up Paddle; Muscle Strength; Speed; Performance; Shoulder Strength

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OXYGEN AVAILABILITY CHANGES DURING STRENGTH PROTOCOL IN PREFONTRAL CORTEX

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ABSTRACT

In every sport, during training and competitions athletes need to perform complex technical gestures as efficiently and effectively as possible, involving several demanding multi-joint movements (Schoenfeld et al., 2021). The brain is responsible for controlling and coordinating when and how muscle contractions occur to maximize overall performance. The literature shows that the amount of oxygen available in the brain is largely related to cognitive performance and directly interferes with sports performance (Herold et al., 2018). Strength training is widely used as an exercise to improve performance and health. The use of high loads in this type of training promotes changes in cerebral hemoglobin consumption. Thus, the aim of our study was to analyze oxygen consumption in the PFC during a 6RM back squat protocol in all repetitions. 6RM of back squat was performed by nine men (31.2±3.2. years; 76.7±4.1kg; 1.76±1.2cm). Blood lactate was measured before the protocol for fatigue control. The concentration of oxygenated hemoglobin (O2Hb), deoxygenated hemoglobin (HHb), total hemoglobin (tHb), and tissue oxygenation index (TOI) of PFC was measure in every six repetitions. O2Hb only increased in the first five repetitions (7.82±1.5 vs 10.21±1.9 vs 13.4±2.1 vs 15.52±2.6 vs 16.22±2.1 vs 15.98±2.2 µmol/L; $p<0.05$). HHb increased in the last three repetitions (0.67±0.9 vs 0.73±1.1 vs 0.98±1.3 vs 1.34±1.2 vs 1.43±1.5 vs 1.61±1.1 µmol/L; $p<0.05$). In the last repetition before failure it was not possible to maintain the increase of oxygen supply in the PFC which can indicate that the remaining oxygen supply in the muscle may allowed to performed the last repetition in this protocol.

Keywords: Resistance training; PFC; Strength protocols; Oxygenated hemoglobin

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ACQUISITION OF SLOW ABDOMINAL BREATHING IN CHILDREN AGED 7 TO 9: RESULTS AFTER 10 MINUTES OF EXPLORATION

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ABSTRACT

Slow abdominal breathing (SAB), focusing on the lower abdomen, is a calming technique that decreases HR and increases heart rate variability (HRV) (Catela et al., 2024). This technique has been studied in several populations, including adults and elderly (Laborde et al., 2022), but there is limited literature on children. This study aimed to investigate whether children aged 7 to 9 years can acquire SAB after a short exploration period. 25 children aged 7 to 9 years, with an average age of 8.72±0.45 years, participated in the study. Participants performed two types of breathing in the supine position, each for 10 minutes: i) normal breathing, without instruction; ii) SAB. Between tasks i) and ii), researchers taught the SAB technique, guiding a few cycles and allowing 3 minutes of practice. During the explanation, participants placed one hand on the navel and the other on the chest, inhaling and exhaling only through the abdomen motion, felled by the hand on the abdomen rise and fall (like a balloon), during inhalation and exhalation, while the hand on the chest remained still. Breathing cycles were counted minute by minute. A significant decrease in respiratory cycles was observed during SAB (p=0.001), averaging 11.2 cycles, with a lower standard deviation (±3.2), compared to normal breathing (18.4±5.9). All the children except one (n=24) reported feeling "calmer and more relaxed" during the calming technique. Results show that children aged 7 can acquire SAB, after a short practice period, with significant acute effects in respiratory cycles reduction, which may result in a decreasing of sympathetic nervous system activity and an increasing of parasympathetic nervous system activity. Teaching SAB from an early age can provide children with a tool for calm and relaxation, helping them handle stressful situations throughout life. Future studies should include HRV evaluation when applying this technique in children, in order to analyze acute effects in the autonomous nervous system.

Keywords: children, slow breathing technique, motor control, autonomous nervous system, health.

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RISK ANALYSIS IN THE IMPLEMENTATION OF A SURF SCHOLL AT PRAIA NORTE, NAZARÉ

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ABSTRACT

Introduction: Surfing takes place in dynamic and unpredictable environments, such as waves and ocean currents, which inherently present risks. Brito et al. (2015) highlight the importance of safety measures and adequate preparation due to the variable conditions of the ocean. Silva and Almeida (2018) emphasize the use of appropriate equipment and education about the dangers of the marine environment to prevent accidents. Lopes and Ferreira (2016) stress the importance of cooperation between practitioners, trainers, and regulatory entities in promoting safe practices, both recreational and competitive. Objective: This study utilizes the principles of ISO 31000:2018 to establish action guidelines in risk management. The approach focuses on identifying and mitigating risks associated with surfing, considering both internal and external factors. Methodology: A literature review of ISO 31000:2018 was conducted, providing fundamental guidelines for the methodological structuring of risk management, allowing for a systematic and replicable approach. The method- ology is based on the principles of the standard, encompassing the stages of identification, analysis, evaluation, and treatment of risks associated with surfing. Results: The main risks identified with higher probability and consequence are strong currents and large waves. Risks with lower probability and consequence include weather conditions, which can be mitigated with supplementary safety equipment. Conclusion: Identifying and mitigating risks in surf lessons are essential to ensure the safety of practitioners, especially in a dynamic and unpredictable environment like the ocean. Effective risk identification, considering fac- tors such as weather conditions, local characteristics, and students' skill levels, allows for the development of targeted mitigation strategies. Measures such as continuous instructor training, the use of appropriate safety equipment, and promoting a culture of awareness among practitioners are fundamental to minimizing incidents and ensuring a safe and enriching experience.

Keywords: Surfing, Risks, Nazaré, Mitigation, Safety

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EXTERNAL AND INTERNAL LOAD VARIATIONS AND THEIR RELATION TO MENSTRUAL CYCLE FROM PRE-SEASON TO IN-SEASON OF AN ELITE FEMALE SOCCER TEAM

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ABSTRACT

The last years were marked by the exponential growth of women's soccer and current elite players might be exposed to higher training and competitive, possibly having implications for both performance and health. Despite the lack of evidence on the relationship between hormonal fluctuations during MC and changes in performance, research has pointed out changes in subjective measures of physical and psychological character (Romero-Parra et al., 2020), so the well-being quantifications have become a frequent. The study aim was to describe the external, internal load and menstrual cycle influence during four microcycles of pre-season and the first microcycle of in-season in an elite female Portuguese soccer team. Twenty-five players participated in the study (age 25 ± 3.98 years, weight 59.27 ± 6.2 kg, height 1.62 ± 0.04 m). External load measures included total distance, high-speed running (HSR) distance (≥15 km/h), number of accelerations and decelerations [acceleration 1 (ACC1), >1–2 m/s; acceleration 2 (ACC2), >2–3 m/s; acceleration 3 (ACC3), >3–4 m/s; acceleration 4 (ACC4), >4 m/s] and decelerations [deceleration 1 (DEC1), <1–2 m/s; deceleration 2 (DEC2), <2–3 m/s; deceleration 3 (DEC3), <3–4 m/s; deceleration 4 (DEC4), <4 m/s] (Oliveira et al., 2024). Internal load measures included rating of perceived exertion (RPE) and its multiplication by session duration to generate session-RPE. The menstrual cycle was checked using a google forms questionnaire before each training session and game. The results showed higher intensity values as the pre-season progressed and there was an increasing load from M1 to M4. From M4 to M5, most of the measurements remained similar. The highest values occurred in M3 for the majority of external load metrics. The menstrual cycle seems to have a slighty influence on the management of the training load.

Keywords: female football; monitoring, internal load; external load, menstrual cycle.

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RISK ANALYSIS IN THE IMPLEMENTATION OF A SURF SCHOLL IN FOZ DO ARELHO

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ABSTRACT

Introduction: Surfing is a sport practiced in dynamic and unpredictable environments, such as waves and ocean currents, making it inherently risky. Meir et al. (2012) highlight the im-portance of effective risk management strategies due to the variable conditions of the ocean. Moran (2011) emphasizes that awareness and good practices, such as the use of safety equipment, are crucial to reducing injuries. Nathanson et al. (2002) underscore the relevance of collaboration between surfers, instructors, and organizations in implementing preventive measures in both recreational and competitive contexts. Objective: This study utilizes the principles of ISO 31000:2018 to establish action guidelines in risk management. The approach focuses on identifying and mitigating risks associated with surfing, considering both internal and external factors. Methodology: A literature review of ISO 31000:2018 was conducted, providing fundamental guidelines for the methodological structuring of risk management, allowing for a systematic and replicable approach. The methodology is based on the principles of the standard, encompassing the stages of identification, analysis, evaluation, and treatment of risks associated with surfing. Results: The main risks identified with higher probability and consequence are currents, wave size and type, fog, and strong winds. Risks with lower probability and consequence include dehydration, sunburn, and hypothermia. Conclusion: The safety of surf lessons critically depends on the identification, mitigation, and reduction of risks, especially in such a dynamic and unpredictable environment as the ocean. Accurately assessing risks, considering factors such as weather conditions, specific characteristics of the location, and the skill levels of students and specific training of instructors, is essential for developing effective mitigation strategies. Although some hazards have been identified and assessed, they can be mitigated, thereby raising safety levels.

Keywords: Surfing; Risks; ISO 31000:2018; Mitigation; Safety

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NEEDS, FACILITATORS AND BARRIERS IN ADHERENCE TO PHYSIOTHERAPY IN CEREBRAL PALSY. WHAT DO INFORMAL CAREGIVERS SAY ABOUT IT?

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ABSTRACT

Introduction: Cerebral palsy (CP) is the most common motor disability in childhood and physiotherapy plays a key role in the rehabilitation of these children. Caregivers are central actors to ensure adherence and continuity of the intervention at home, however, they can only partially follow the recommendations. A better understanding of their perspectives on this topic will contribute to strengthening their own skills and improving the support provided by physiotherapists. Objectives: The present study analysed the perspective of informal caregivers of children with CP about their needs regarding adherence to Physiotherapy intervention and explored the main barriers and facilitators felt by them in this domain. Methodology: A qualitative study was carried out, using a thematic analysis, with a non-probabilistic, convenience and snowball sampling. 16 semi-structured interviews were conducted online with informal caregivers of children with CP between 2 and 11 years old, and a questionnaire was used to collect sociodemographic and clinical data. Results: 37.5% of caregivers consider "relatively easy" adhering to the intervention. From the thematic analysis, six main themes emerged, highlighting the need to recognize gains for the child's global development, the nature of therapeutic support, the child's and their own characteristics, the importance of education and training of caregivers, but also the impact of contextual and supporting factors. Conclusion: This study shows that caregivers value adherence to the intervention and its continuity at home, however, there are several factors that influence its implementation. Gaining knowledge about these factors, such as relevant barriers and facilitators to adherence, allows to assist clinical practice, facilitates change according to the family's needs and maximizes their involvement in the intervention.

Keywords: cerebral palsy; informal caregivers' needs; adherence to physiotherapy.

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DESIGN AND VALIDATION OF AN INSTRUMENT FOR TECHNICAL ANALYSIS IN INLINE SPEED SKATING

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ABSTRACT

Inline Speed Skating is a sport where technical skills are very important. Tracks have symmetric curves and the usual techniques are crossover and slide. For elite skaters, it is important to have a very specific and personalized observation skill of this techniques. An observation instrument created in 2012 (Medeiros, L., Louro H.) was adapted and developed to register motor patterns analysis in a track with banked parabolic curves and is composed of a system of field formats and categories (Oliveira et al., 2001). The observation instrument is composed of 6 observation moments with a total of 45 alphanumeric codes. A qualitative analysis through methodological observation (Anguera et al, 2000) was used to register skater's technique when they performed the 2nd curve of 200 meters flying lap. To image capturing, three cameras were used to register skater's performance from beginning, to end of the curve. The quality and validity of the instrument and it's the rigor and objectivity, were guaranteed using the Kappa Index (Cohen, 1960 and 1968; Anguera, 1993; Blanco, 1993 and 1997; Sousa, L. *et al*, 2022), based on the records of three trained observers and, for precision purposes, one more specialist, all with 95% agreement. Conclusions: the instrument can be used by elite skaters coaches as a valid and viable tool to observe and evaluate crossover and sliding techniques on the curve.

Keywords: Methodological Observation; Technique; Inline Speed Skating

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OBSERVATION AND TECHNICAL ANALYSIS IN INLINE SPEED SKATING

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ABSTRACT

This study aimed to analyse motor patterns of three experienced skaters of inline speed skating on a track with banked parabolic curves. An observation instrument created in 2012 (Medeiros, L., Louro H.), composed of a system of field formats and categories (Oliveira et al., 2001) was adapted and used to register the observed motor patterns during the full extent of the curve. The observation instrument is composed of 6 observation moments with a total of 45 alphanumeric codes. Using qualitative analysis through methodological observation (Anguera et al, 2000), this study focused on register elite skater's (3 male with 18, 20 and 24 years old) performance when skating the 2nd curve of a 200 meters flying lap. Three cameras were used to capture skater's performance from beginning, to the end of the curve. To detect the existing patterns of each skater, the Theme 5.0 software was used (Magnusson, 2000; Magnusson et al., 2004; Anguera et al. 2007). Discussion: different alphanumeric codes and different numbers of codes were observed in the 6 moments of observation. All three skaters had different behavioral patterns. Conclusions: even amongst elite skaters, no common behavior patterns were found. Every skater have their own physical and technical skills.

Keywords: Methodological Observation; Technique; Inline Speed Skating

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EXPERIENCE EFFECT IN THE ADJUSTMENTS TO SURFACE RIGIDITY IN VERTICAL JUMPS: EXPLORATORY STUDY

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ABSTRACT

On an elastic surface there is a non-conscious adaptive increase (≈50 ms) in muscle stiffness and mechanical work (Moritz & Farley, 2004; Ferris & Farley, 1997). After jumping on an elastic surface (8.9 N/mm), jumping on the ground reveals a reduction in height (Márquez et al. 2010), and a distinct motor pattern may occur at ankle (Farley et al., 1999, 1998). However, skill and knowledge of the stiffness of the jumping surface influence muscle stiffness (Arampatzis et al., 2001; McNitt-Gray et al., 1994). The objective of this study was to verify whether there is an effect of experience on the ability to adapt vertical impulsion on the ground, after activity on an elastic surface (Jump). 120 adults (21.03±6.4 years of age, 67 women; 7 Jump women, 25.41±10.3 years of age, 10.29±5.1 months of practice), performed 5 successive jumps on the ground, as high as possible, before (pre-test) and after (post-test) 5 min aerobics warm-up and 5 min Jump session (stiffness 5-15 N/mm), and after 2 min rest (test retention). Results: From pre-test to post-test, inexperienced practitioners reduced 1.71 cm (ns) and experienced practitioners increased 1.32 cm ($\chi r2$= 7.176, p=.028, W=.21; Z=3.101, p=.002, d=2.28). From the post-test to the retention test, the inexperienced participants increased 1.74 cm (ns) and the experienced participants decreased 1.02 cm (ns). Inexperienced and experienced individuals tended to differ in the post-test (U=1.919, p=.055, d=.36, rrb=.29), but not in the pre-test and retention test. Discussion: The experienced ones may have anticipated, adjusted and taken advantage of the Jump's rigidity, while the inexperienced ones did not. Professionals must bear in mind that those who are inexperienced on elastic surfaces need a perceptual-motor tuning process, until they can demonstrate similar impulsion to experienced ones, in order to take advantage of additional muscular rigidity.
Keywords: surface rigidity; experience; jump, motor control.

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THEME 5

Sustainable Agri-food Systems

THEME 5

Oral communications

FOOD AND ENVIRONMENT: HOW TO EVALUATE THE ENVIRONMENTAL IMPLICATIONS OF FOOD PRODUCTION

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ABSTRACT

Agriculture is the basis of food production and to feed human population has an unquestionable effect on the environment. In this sense, recent European strategies as the European Green Deal and the Farm2Fork strategy aims to reduce the environmental footprint of the need to feed an increasing human population. Therefore, Europe is concerned with the environment and committed with its protection, and has developed strategies for, for example, the decarbonization of the planet, while in other parts of the world the priority is just to be able to reduce hanger in accordant to the second objective of the Sustainable Development Goals – SDG. In this work, we attempt to make a revision of some strategies to reduce the environmental footprint of feeding the human population. Such an evaluation will be addressed on the basis of the technical and scientific strategies to effectively evaluate the effectiveness and viability in the improvement of their environmental performance. Strategies are such the reduction of chemical inputs in sustainable agriculture (Araujo et al. 2020), the certified organic agriculture and the urban agriculture and zero miles agriculture (Urbano et al. 2022), as well as the replacement of proteins for new sources (Gómez-Luciano et al. 2021). Strategies were analysed using the tool of Life Cycle Analysis, to evaluate their real contribution to the improvement of the environment by the food system. Then, was discussed the impact that the integration of environmental variables into the food system has on the quality of life.

Keywords: Life Cycle Assessment; Food system; Agriculture.

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FROM PULP TO GUT: PREBIOTIC PRODUCTION FROM BLEACHED *EUCALYPTUS KRAFT* PULP

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ABSTRACT

Through the past years, there has been an increasing interest in functional foods, including prebiotics, substrates selectively utilized by host microorganisms to confer health benefits [1].To address this growing demand and the need for sustainable, industry-suited production/purification processes, this work explores an unconventional, yet promising, source for prebiotic production: bleached *Eucalyptus kraft* pulp (BEKP). Widely used in pulp and paper industry, BEKP is mainly composed by cellulose and hemicellulose, with 16–23% xylan, making it a suitable and cost-effective raw material for producing xylooligosaccharides (XOS), emerging prebiotics derived from xylan with recognized health benefits. Two production methods were tested and optimized, focusing not only on maximizing XOS yield , but also on minimizing environmental impacts, with particular emphasis on reducing waste and chemical products usage.From these, direct enzymatic hydrolysis of BEKP demonstrated to have more advantages, including higher XOS yield, fewer impurities, simpler process, and greener nature, especially when using water as reaction medium. Under optimized conditions, more than 50 kg XOS/ ton BEKP can be produced, predominantly xylobiose and xylotriose, (> 98%), oligosaccharides to which the highest prebiotic effect is attributed [2]. A thorough purification of the obtained hydrolysate was then conducted by membrane separation processes. A dual-stage ultrafiltration, employing 5 and 2 kDa membranes, effectively reduced enzyme content (the only impu- rity with mandatory removal), leading to a product exceeding 80% XOS content. Seeking higher purity, a second purification step by nanofiltration was explored, which coupled with diafiltration, can increase XOS content in the final product to over 96%. In conclusion, this work proposes and validates a sustainable, ecofriendly process for producing high-purity prebi- otics from a hardwood *kraft* pulp. The production of these high-value products thus represents an excellent opportunity for the pulp and paper industry to diversify its product range into the food and pharmaceutical sectors.

Keywords: Prebiotics; Xylooligosaccharides (XOS); Bleached *Eucalyptus kraft* pulp (BEKP); Enzymatic Hydrolysis; Membrane Separation Processes.

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Acknowledgements

This work was carried out under the Project inpactus – innovative products and technologies from eucalyptus, Project N.º 21874 funded by Portugal 2020 through European Regional Development Fund (ERDF) in the frame of COMPETE 2020 nº246/AXIS II/2017.

GREEN SUPER GUMMIES: INTEGRATING MICROALGAE INTO MODERN DIETS

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ABSTRACT

In recent years, consumer demand has increasingly favored foods that deliver health benefits beyond basic nutrition. Among functional ingredients, *Chlorella vulgaris* has emerged as a standout option due to its rich nutritional and bioactive profile. Packed with protein, vitamins, essential fatty acids, and antioxidants, *C. vulgaris* is a valuable addition to functional food products.[1] This study aimed to develop gummies enriched with *C. vulgaris* to create a health-promoting confectionery. Formulated with agar-agar, the vegan gummies incorporated *C. vulgaris* to enhance their nutritional value. Texture profile analysis confirmed that the gummies retained desirable characteristics such as hardness, cohesiveness, and chewiness, aligning with consumer preferences for similar products. Nutritional evaluations revealed that microalgae-enriched gummies contained significantly higher levels of protein, vitamins, and essential fatty acids compared to standard formulations. Additionally, antioxidant activity, assessed using DPPH and FRAP assays, demonstrated a notable increase, highlighting the gummies' potential to counteract oxidative stress. A sensory evaluation assessed the gummies' color, taste, texture, and overall acceptability. While the addition of *C. vulgaris* imparted a green color and a mild earthy taste, participants rated the flavor and mouthfeel favorably, indicating broad consumer appeal despite these changes. This research demonstrates the potential of *C. vulgaris* as a functional ingredient in gummy formulations, offering a nutritious and appealing product for health-conscious consumers. By leveraging *C. vulgaris* unique properties, these gummies represent an innovative contribution to the functional food market.

Keywords: microalgae; functional gummies; *Chlorella vulgaris*; vegan.

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Acknowledgments

This work was funded by national funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., under the project UIDB/04129/2020 of LEAF-Linking Landscape, Environment, Agriculture and Food, Research Unit.

THEME 5

Posters

DIFFUSE POLLUTION FOOTPRINT ASSESSMENT UNDER THE CONTEXT OF THE PEGADA 4.0 PROJECT

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ABSTRACT

The efficient use of resources in agriculture, the restoration and preservation of biodiversity and rural landscapes, alongside carbon footprint and diffuse pollution reduction were the main reasons for the creation of the PEGADA 4.0. This project is composed of 29 strategic partners: 20 agricultural SMEs; an AgroTech SME; 5 non-Business Entities of the P&I System ("ENE-SII"), one state Laboratory and two of the most important Portuguese cereal producer associations that will be the facilitators and end-users of the PEGADA 4.0 results. The School of Agriculture from the Santarém Polytechnic University is responsible for a set of activities related to the diffuse pollution footprint assessment (WP1) in cereal and horticultural crops. Within the scope of this task and given its importance in terms of environmental and economic impact, it was determined the nitrogen-related (N) pollution. For this purpose, four plots were considered and installed in real scale cultivation fields: a)"Boicilhos" – Couço; b) "Estação de Regadio António Teixeira" – Coruche; c) "Monte Real" – Salvaterra de Magos; d) "Quinta da Cholda" – Golegã, where since 2023 the various inputs and outputs of N into the system have been quantified, aiming to evaluate the efficiency of its use and the impact of N as a pollution factor in the environment. This approach has been carried out from the perspective of cultural succession, and not for each individual crop, which is why the balances of the agricultural years and the project period, from 2023 to 2026, will be considered.
Keywords: Cover crops; Cultural system Nitrogen efficiency; Zea mays L.

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Funding

Project supported by PRR - Recovery and Resilience Plan and the NextGeneration EU European Funds PRR-C05i03-I-000099. 7/s13593-014-0207-8.

ASSESSMENT OF THE DIFFUSE POLLUTION PLUME FROM THE USE OF UAV AND TRADITIONAL SPRAYERS IN FIELD CONDITIONS

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ABSTRACT

In 2009, the first plant-protection unmanned aerial vehicle (UAV) was developed in China by the Agricultural University and in 2015 DJI, one of the biggest developers of UAV's, announced the launch of their first cropspraying drone. Since then, the use of this technology has been increasing all around the world, although in Europe, legislation is not favourable to the use of Sprayer UAV's or drones, as they are commonly named, due to their designation as aerial sprayers which includes them in the same category as plane spray and brings several restrictions to their use. Nonetheless, farmers Europewide are pressuring for change and even the European parliament recognizes some advantages to the use of sprayer drones, such as the reduction of inputs. To overcome the gap between existing legislation and crop production needs, specific regulations based in scientific experimentation is required. This should define precise parameters like fly hight and speed, spray volume and droplet, to maintain application efficiency and safety. This work aims to contribute to the increase of information on this subject by compare the diffuse pollution plume resulting from the use of conventional sprayers (CAS) vs the use of a sprayer drone (SD) to apply a wetting agent over a 40 m row and drift assessment in both the wind direction and perpendicular to the wind. The CAS used was a Bargam MEC BDX with 1200 L tank, 15 arm length with a 30-nozzle layout and the SD was a Drone XAG P100 with a flow rate up to 6 L/min, spraying width of 10 m and a 40 L tank. The results show an increase of drift, confirming the information found in the literature, but also the higher uniformity of distribution.

Keywords: agricultural drones, grey footprint, precision agriculture, spray technology

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Funding

Project supported by PRR - Recovery and Resilience Plan and the NextGeneration EU European Funds PRR-C05i03-I-000099.

PROMOTION OF SUSTAINABLE AND HEALTHY DIETS IN 1st CYCLE SCHOOLS OF PORTUGAL'S LEZIRIA DO TEJO REGION

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ABSTRACT

This study focuses on promoting sustainable eating habits and reducing food waste through interventions targeting primary school students from the eleven municipalities of Portugal's Lezíria do Tejo region. Recognizing the growing concerns around unhealthy eating behaviors, this initiative aims to instill lifelong habits that align with Mediterranean diet (MD), known for its health and environmental benefits (Medori et al., 2023). By encouraging adherence to MD, the program contributes to achieving global objectives, such as the United Nations' Sustainable Development Goals (SDGs), from strategies defined by the European Commission (Ban, 2016) and was designed in response to an invitation to contract services to Escola Superior Agrária de Santarém/IPSantarém by APRODER - Associação para a Promoção do Desenvolvimento Rural do Ribatejo. The interventions aimed to enhance students' knowledge about sustainable eating and reduce food waste. Educational activities included promoting MD's key principles, such as increased consumption of fruits, vegetables, legumes, and olive oil, alongside strategies for minimizing food waste in daily practices. This dietary pattern uses a healthy culinary base, emphasizing dishes cooked in water and fresh, seasonal ingredients. To achieve these goals, a set of interventions was defined, and educational materials were created for both children and teachers, enabling the replication of actions in the classroom. Activities were conducted in two phases—January and February, followed by June 2024—across 23 schools. Interactive activities included sensory identification of regional agricultural products (autumn-winter and springsummer), preparation of balanced, healthy, and sustainable meals, and participation in planting and composting processes. Structured surveys conducted by trained staff allowed for robust pre- and post-intervention assessments of dietary behavior changes. The intervention demonstrated the potential of school-based programs to raise awareness about sustainable dietary practices among young children.

Keywords: Interventions; Mediterranean diet; healthy food; food waste; food choices.

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EXPLORING THE ANTIOXIDANT AND ANTIDIABETIC POTENTIAL OF *ANACARDIUM OCCIDENTALE* FROM CABO VERDE

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ABSTRACT

Diabetes mellitus is a serious health problem. It is foretold that there will be at least 350 million people in the world with type 2 diabetes by the year 2030, if suitable prevention measures are not taken (Romeiras et al., 2023). Medicinal plants with antidiabetic potential are being evaluated as alternative therapies in the management of this disease and its associated complications. The bark of *Anacardium occidentale* tree, from Cape Verde is used in traditional medicine to treat diabetes symptoms. Thus, the objective of this study was to evaluate the antidiabetic and antioxidant potential of aqueous and hydroethanolic (70%) extracts obtained from the bark of the *Anacardium occidentale* tree, from Cape Verde. The phytochemical composition of the extracts was evaluated by determining the total phenol and flavonoid contents. The antioxidant potential was evaluated by the Ferric Reducing Antioxidant Power Assay (FRAP) and by the DPPH radical scavenging assay. The antidiabetic potential was assessed *in vitro* by α-amylase and α-glucosidase enzyme inhibition assays. Both aqueous and hydroethanolic extracts showed antioxidant activity in both assays. The extracts inhibited the activities of the carbohydrate digestive enzymes αglucosidase and α-amylase in a dose-dependent manner. For α-glucosidase, the detected inhibitory activity was significantly higher than that of acarbose, an antidiabetic drug used as positive control, suggesting that extracts of *Anacardium occidentale* can delay glucose absorption, thereby assisting in slowing down the progression of diabetes. The antioxidant activity of the extracts may also contribute to the prevention or treatment of diabetes, as oxidative damage has been identified as a risk factor for diabetes development and for the tissues damage caused by this disease (Romeiras et al., 2023).

Keywords: Antihyperglycemic potential; diabetes; herbal medicine; medicinal plant; *Anacardium occidentale*.

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DEVELOPMENT OF INDICATORS FOR TECHNOLOGICAL INNOVATIONS IN THE AGRICULTURAL SECTOR

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ABSTRACT

The CRIKIT project aims to develop an advanced multi-criteria analysis tool to evaluate the techno-economic, social, and environmental feasibility of climate-resilient agricultural practices. The methodological approach integrates global climate scenarios, and a detailed assessment of disruptive technologies applied to key crops such as cereals, vineyards, and olive groves. As part of the project activities, a comprehensive statistical survey of the current state of olive groves in Portugal was conducted, complemented by a nationwide georeferencing of olive groves, categorized by type of system, (INE, 2023). Additionally, an inventory for a selected case study is being developed, which will serve as a basis for conducting a life cycle assessment. Key findings reveal that 85% of olive production occurs in the Alentejo region, with intensive and super-intensive systems achieving productivity levels between 8,500 and 14,000 kg/ha, (Tous et al., 2014; Zion et al., 2011). Traditional systems, although less productive, occupy a significant area of 146,770 hectares, highlighting their enduring importance. The methodology includes the identification and evaluation of emerging technologies in terms of techno-economic and social performance, as well as the quantification of their greenhouse gas mitigation potential, (De Luca et al., 2023). Based on this data, a decision-support tool integrating multiple criteria will be developed to inform sustainable management policies. The expected outcomes will guide policymakers and agricultural stakeholders in adopting resilient and sustainable practices, while simultaneously promoting food security and conserving terrestrial ecosystems in the face of growing climate challenges.

Keywords: Climate change; Disruptive technologies; Multi-criteria analysis; Sustainable agriculture.

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IMPACT OF *ACHETA DOMESTICUS* POWDER IN BREAD'S NUTRITIONAL AND SENSORY PROPERTIES

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ABSTRACT

According to the United Nations, current food production won't be enough to feed the projected global population of 2050 (Van Huis et al., 2013). As such, it is of the utmost importance to start the development of sustainable alternatives. Edible insect powder is a promising sustainable alternative to traditional livestock-derived protein. Insects provide high protein content, fibre, essential minerals, and have a neutral taste, making them suitable for various food applications. Insect-based food products can meet the growing demands of the global population while addressing nutritional and environmental challenges such as protein deficiency, water scarcity and global warming (Acosta-Estrada et al., 2021; Borges et al., 2022). Project SPIN (Sustainable ProteIN, PRR-C05-i03-I000192-LA9.5), in line with these challenges, aims to develop new protein rich products based on more sustainable sources. One developed product is bread with 10% incorporation of *Acheta domesticus* (common house cricket) powder. Bread was analysed for proximate composition, following Kjeldahl method for protein, Weende method for fibre, and lipids by Soxhlet and for microbiological safety. Lipid profile was determined by Gas chromatography with flame ionization detector (GC-FID). Consumer perceptions were evaluated by a hedonic test and a profile test. An untrained panel participated in three sessions, for a total of 59 responses. The samples were evaluated in triplicate using a 5-point hedonic scale, from 1 ('disliked') to 5 ('liked very much'). Color, texture, odor, and taste were also ranked. The developed bread presented 17.27% ± 0.25 protein, 0.80% ± 0.01 fat, 40.03% ± 0.21 carbohydrates, and 3% ± 0.07 fiber. Enterobacteriaceae counts were below 1 CFU/g and the remaining microbial parameters show high degree of hygiene. The fatty acid content was mainly linoleic, palmitic, oleic, linolenic and stearic acids (34.6%, 26.0%, 24.1%, 7,2% and 1,4% respectively). The hedonic tests results show a general appreciation of the product, with a high intent to purchase with only 17% indicating they would not buy the product.

Keywords: cricket powder; new products; protein; sustainability

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PRODUCTION OF A BIOFUNGICIDE: NA ECOLOGICAL APPROACH TO PLANT DISEASES

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ABSTRACT

The agroindustry presents some challenges in terms of the bioeconomy and the reuse of its waste and by-products, thus seeking green processes and technologies that enhance this reuse. The juice industry is an example of a food industry that generates large amounts of organic by-products that can and should be valued (Pedro, 2024). Thus, the objective of the present study was to develop a biological fungicide through the extraction of essential oil from orange peel. This waste from the juice industry is thus reused, serving as raw material in the production of the biofungicide. The extraction process included several stages, especially distillation, decantation and drying. The average yield of pure oil is 1.075 %/kg of orange peel. The proof of concept is ready and the technology validated, corresponding to a TRL of 4. This study is aligned with the business needs of the region, since the region of Santarém has agroindustry focused on the production of juices. In addition to the need to recover waste/byproducts, there is a large agricultural production in the region, which according to European guidelines will have to convert 25% of agricultural land into organic farming (European Commission, 2020), reinforcing the importance of developing new molecules of biological origin that allow these objectives to be achieved. This project intends to build a new biological refinery linked to the agri-food sector, contributing to the green transition, valuing and promoting the sustainability of the territory in its different pillars, creating wealth, generating employment, allowing people to settle in low-density regions, like those in the district of Santarém (Comissão Interministerial de Coordenação, 2023), and reducing the environmental impacts resulting from the disposal of organic waste in landfills.

Keywords: biofungicide, biorefinery, agro-industrial waste; green transition; waste recovery.

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FIGHTING MASTITIS: THE ANTIMICROBIAL POTENTIAL OF BLACK SOLDIER FLY LARVAE HEMOLYMPH

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ABSTRACT

Mastitis is a prevalent and economically significant disease in dairy production, causing substantial losses in milk quality and quantity. The primary bacterial pathogens responsible for mastitis include *Staphylococcus aureus, Streptococcus agalactiae, Mycoplasma bovis* and *Corynebacterium bovis*. Traditional treatments rely on antibiotics, which, although effective, have led to increased antimicrobial resistance due to their excessive and indiscriminate use. This resistance poses significant public health risks and reduces the efficacy of these treatments (Sharun et al., 2021). In search of innovative and sustainable solutions, the hemolymph of the black soldier fly (BSF, *Hermetia illucens*) has emerged as a promising alternative (Scieuzo et al., 2023). Known for its role in organic waste recycling and as a sustainable protein source, BSF hemolymph exhibits immunological properties capable of combating various pathogens (Scieuzo et al., 2023; Wang & Shelomi, 2017). This study aims to evaluate the antimicrobial potential of BSF hemolymph against bacterial strains that cause mastitis in dairy cows, offering a natural alternative to conventional antibiotics. The research involves several key steps: production of BSF larvae, extraction of hemolymph, preparation of bacterial cultures, and antibiogram testing using agar diffusion with paper discs. The larvae will be produced at the Entogreen Research and Development Unit, followed by a meticulous process of hemolymph extraction. Bacterial suspensions will be prepared at the Escola Superior Agrária de Santarém, where a selected strain will be inoculated and incubated. The antibiogram will assess the sensitivity of this bacteria to the hemolymph, providing insights into its efficacy. This study aims to reduce antibiotic dependence and promote sustainable dairy farming practices by leveraging the natural antimicrobial properties of BSF hemolymph. The findings could lead to a more effective and environmentally friendly approach to managing mastitis, addressing one of the major challenges in dairy production today.

Keywords: antimicrobial resistance; dairy cows; sustainable alternatives

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HAYLAGE PRODUCTION OF TWO LOLIUM SPP CULTIVARS (*Lolium italicum* and *Lolium perenne*)

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ABSTRACT

Feeding can represent 50 to 78.4% of the total milk production costs and impacts milk production price. The milk price paid to Portuguese dairy farmers is among the five lowest in the European Union (EU) (Rodrigues et al., 2019). Between October and November 2024, Portugal's milk price was 0.445 €/kg. The EU average in the same months was 0.523 €/kg (ARD, 2025). These facts show that it is essential to satisfy the dairy cows' nutritional requirements and reduce feeding costs to increase farm profitability. One way to achieve this is to work with a feeding plan based on forage produced on the farm, which could be economically attractive. Ryegrass (*Lolium multiflorum* Lam.) species are important grasses in temperate agriculture that provide forage for ruminants. Italian Ryegrass (*Lolium italicum*) is native to Europe and neighbouring countries (Stanisavljevic et al., 2011), local Ryegrass (*Lolium perenne* L.) is the preferred species for permanent pastures in Açores Islands. Easy establishment, good productivity, good adaptation to different management methods, and good nutritional value are the reasons. This study aimed to compare two Lolium cultivars (Italian and Local) to haylage production during the year in Açores (São Miguel Island). Ryegrass was cultivated at São Miguel Island between 2023 and 2024, in the same soil and weather conditions without water support. Each haylage roll produced was plasticized in plastic film and weighed approximately ± 550 kg. The Italian Ryegrass production was 15 rolls during Winter, 27 in Spring, and 40 in Summer. The local Ryegrass production was 19 rolls during Winter, 31 in Spring, and 45 in Summer. The results showed that the regional ryegrass productivity was superior to the Italian Ryegrass. The results could lead to a cheaper and more local-friendly approach to milk production, reducing fertilizers and water use and encouraging local forage use in dairy production.

Keywords: ryegrass haylage; dairy production; local forage; dairy nutrition.

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TOWARD A SAFETY FOOD: THE URGENT NEED FOR A COMPREHENSIVE TOXICOLOGY DATABASE ON AGRICULTURAL PESTICIDES

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ABSTRACT

Pesticides play an important role in modern agriculture by protecting crops from pests and diseases. However, their intensive use causes serious concerns regarding their toxicological effects on human health, non-target organisms, and ecosystems. Despite the availability of dispersed toxicological data, the lack of a centralized and accessible database obstructs the ability of researchers, policymakers and stakeholders to assess and manage the risks associated with pesticide exposure. This poster highlights the importance of such data and the need to compile and systematize information on the toxicology of pesticides used in agriculture. A comprehensive database would serve as a repository of scientific data, including the active ingredients, their mechanisms of action, toxicity, environmental fate and impacts on humans, animals and biodiversity. Such a resource would address critical knowledge gaps by integrating data on acute and chronic toxicity, such as carcinogenicity, neurotoxicity, endocrine disruption, and reproductive effects. The proposed information would be an essential tool. Farmers and agricultural workers could access the database to make informed decisions, reducing potential risks and promoting safer practices. Additionally, the database would support global efforts to adopt sustainable alternatives. The establishment of this database is critical for balancing agricultural productivity with environmental sustainability and human safety. The proposal presented is a tool with structured information by crop and pest, disease or weed and should be available to farmers for extended use. The basic procedure was to gather information dispersed in international databases, namely EU Pesticides Database (European Comission, s.d), the PPDB - Pesticide properties database, (University Hertfordshire, s.d.) and concerning beneficials the "Side Effects app"- from Koppert (Koppert, s.d) and Biobest (Biobest, s.d) companies, among others easily acessible.

Keywords: IPM; biopesticides; sustainable agriculture, human health; environment

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Funding

This work was supported by a National project PRR – RedeSusterra.

COMPARATIVE STUDY BETWEEN MECHANICAL AND MANUAL PRUNING OF THE FERNÃO PIRES VARIETY

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ABSTRACT

Pruning the grapevine is an essential practice in vineyard management, playing a crucial role in regulating vegetative growth and plant productivity, as well as directly influencing the quality of the fruits (Magalhães, 2015). The aim of this study was to compare the agronomic and physiological effects of mechanical and manual pruning on the Fernão Pires variety. The study was carried out at Casa Agrícola Antunes Barroso (Tejo region). The vineyard, planted in 2012, with the 1013P rootstock, has a planting distance of 3m x 1m, a bilateral *Royat* cord training system and an east-west orientation. Two pruning methods were tried: manual and mechanical. Four rows of vines were used for each modality and five vines were randomly selected from each row. The responses of the vines in each method to the factors imposed by the pruning method, namely pruning load, budbreak and fertility, were evaluated. The mechanical pruning resulted in a higher pruning load but had a lower budbreak rate and fertility index compared to the manual pruning modality. In terms of production and number of bunches per vine, mechanical pruning produced significantly more than manual pruning, although the bunches from manual pruning were heavier. The wine obtained from the grapes of the manually pruned vines had a higher alcohol content than that obtained by the mechanical pruning method. The other physical-chemical parameters of the wine did not show any significant differences. In the sensory evaluation, the wine obtained from manual pruning had a higher color intensity than the wine obtained from mechanical pruning. There were no significant differences between the wines from the two pruning methods in terms of the other attributes evaluated. The economic study of the costs of manual and mechanical pruning led to the conclusion that mechanical pruning is the cheapest and quickest option for winegrowers.

Keywords: mechanical pruning; manual pruning, Fernão-Pires, vine, wine

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SPREADABLE HEALTHY CREAMS PROTEIN+ FROM *Acheta Domesticus*

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ABSTRACT

This project is being carried out at Escola Superior Agrária Santarém. The aim was to develop a new food product from water-in-oil emulsions with the addition of production by-products from the agricultural sector and to enrich it with low-cost protein alternatives, with the aim of providing for the protein needs of the target audience, high-performance athletes. On the other hand, manufacturing processes must be adjusted to meet nutritional requirements, guarantee microbiological control and food quality and safety (Lima et al., 2023). The challenge was to develop a spreadable cream with an addition of strawberry syrup, supplementing the aqueous phase with a protein isolate from cricket powder. This protein isolate extracted from *Acheta domesticus* cricket powder could be a protein alternative that can provide a stable, safe, enriched and healthy product (Gonçalves et al., 2022). Two syrup formulations and five spreads, with and without added protein isolate, were developed and evaluated by a panel of 17 untrained tasters, with different stages of evaluation, appearance, aroma, flavour and overall appreciation so that a prototype could be selected. Currently, the research is continuing with the development of prototypes with a greater amount of protein incorporation and, consequently, proximal analysis and microbiological control. The purpose is to establish the amount of protein added in relation to the recommended daily dose so that effects can be observed in the target consumers.

Keywords: spreadable creams, strawberry syrup, protein isolates, *Acheta Domesticus*.

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EFFECT OF *BOMBUS TERRESTRIS* L. (HYMENOPTERA: APIDAE) ON ZUCCHINI (*Cucurbita pepo* L.) PRODUCTIVITY

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ABSTRACT

Pollinators (arthropods, birds, bats, and other vertebrates) provide essential ecosystem services that enhance biodiversity and influence crop productivity. Recently, new hive technologies have been developed for the use of bumblebees (*Bombus terrestris* L.) in open-field crop pollination. To evaluate the effect of these bumblebees on zucchini (*Cucurbita pepo* L.) fruit growth rates and crop yield, a field trial was conducted at Quinta do Galinheiro, Santarém, Portugal. The zucchini variety under study was "Precioza". The experiment was arranged in a randomised block design with four blocks, each of three pollination treatments: natural pollination, manual pollination, and no pollination with female flower exclusion. Fruits were harvested five days after fruit set, from May 19 to August 9, 2024, and their weight, diameter, and length were recorded. Additionally, the cumulative commercial fruit weight between 41 and 85 days after planting was analysed for natural and no-pollination treatments. The visitation rates of all pollinators were also recorded on zucchini flowers and on the floral margins sown at the field edges (ecological infrastructure). Fruits subjected to natural pollination showed greater weight and commercial size, compared to fruits from the no-pollination treatment. A slight increase in cumulative fruit weight was observed with natural pollination during the final stages of the growth cycle. Bumblebees were the most frequent visitors to zucchini flowers and the floral infrastructure. This study highlights the importance of *B. terrestris* as highly effective pollinators, significantly improving zucchini fruit quality and crop yield while contributing to sustainable agricultural practices.

Keywords: natural pollination, pollinators, sustainable agriculture, zucchini fruits

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VALIDATION OF THE PRODUCTION OF ICED TEA SOFT DRINK WITH MATCHA, GINGER, AND LEMONGRASS

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ABSTRACT

Tea is one of the world's most popular beverages, known for its soothing flavor and numerous health benefits (Trevisanato & Kim, 2000). Matcha tea is rich in antioxidants, particularly catechins, and provides energy through caffeine and L-theanine, which improve concentration, reduce stress and support metabolism (Kochman et al., 2021; Devkota et al., 2021). Ginger is widely recognized for its antioxidant, anti-inflammatory and digestive properties (Shaukat et al; 2023). Lemongrass tea (*Cymbopogon citratus*) has calming properties, promotes relaxation and detoxification, and contributes to skin health and the reduction of premature ageing (Olorunnisola et al., 2014). The combination of these ingredients results in a functional beverage with the potential to improve the overall health of consumers. The aim of this study was to validate the production of an iced tea soft drink using matcha, ginger and lemongrass. Three different formulations were developed and analyzed for validation. Product development was monitored under accelerated shelf-life conditions for 0, 3, 6, 8 and 10 months at different storage temperatures (ambient, 14 °C and 30 °C). The parameters evaluated included physico-chemical analyses (pressure, soluble solids content, pH, acidity and turbidity), microbiological analyses (moulds and yeast counts), and sensory analysis (color, aroma and flavor). In addition, the effective contents of the bottles and the cleaning and sterilization of the filling line were validated. The results allowed adjustments to be made to the formulation and the industrial process. Of the three formulations studied, the one that showed the best performance in the physicochemical, microbiological and sensory analyses was selected to be scaled up for industrial production. Developed in collaboration with a beverage company, this work led to the creation of an iced tea soft drink infused with matcha, ginger, and lemongrass. This functional beverage meets quality standards and market trends, promotes conscious consumption and supports consumer health.

Keywords: matcha; ginger; lemongrass; ice-tea production

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REDESUSTERRA: FOSTERING AGROECOLOGICAL TRANSITION IN PORTUGUESE FARMING

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ABSTRACT

Intensive agriculture, characterized by high-input practices and high yields, has significantly contributed to global food production and has been a key political, economic, and social strategy for decades. Its focus has been on meeting the demands of a rapidly growing population. However, this model poses several challenges to environmental sustainability, human health, and the resilience of food systems. Addressing these issues requires a shift towards more sustainable and regenerative agricultural practices. Agroecological approaches, organic farming, and sustainable land management offer promising alternatives. These methods emphasize environmental conservation, biodiversity promotion, healthy soils, and the long-term resilience of food systems. Although these concepts have been present in scientific literature since the 1920s and reflected in family farming practices and sustainability movements, they have gained prominence in international agendas and public policies, particularly in alignment with the Sustainable Development Goals and the European Union's strategies. Evaluating agroecological performance is crucial for fostering sustainable practices. The OASIS (Original Agroecological Survey Indicator System) framework is a vital tool for monitoring the agroecological transition on farms. Structured into five dimensions, 15 themes, and 56 indicators, it calculates an index to compare farmers' performance globally. Developed by Agroecology Europe, OASIS has been tested in regions such as Kyrgyzstan and Southern Europe (Wazel, et al., 2018). Under the RedeSusTERRA project, the framework is being adapted to Portuguese farmers and local contexts. A case study conducted on a small farm (6 ha) in Santarém applied the OASIS framework to analyze the agricultural system integrative. The farm scored 4.4, 3.6, 4.2, 4.8, and 4.6 across the framework's five dimensions, with a global index of 4.3 (out of 5). This score will be validated over multiple years, highlighting paths for inspiring other farmers and serving as a lighthouse model for driving the agroecological transition.

Keywords: OASIS framework, Agroecological transition, Farm Global Index.

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VEGETATION INDEXES: CONTRIBUTION TO FOREST DIFFERENTIATION

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ABSTRACT

The differentiation of forest species is essential to ensure more appropriate forest management and the conservation and sustainability of forest ecosystems. Vegetation indexes (VI), created from data resulting from the interaction of electromagnetic energy with different terrestrial targets, can help to assess different vegetation covers (Kazemi & Ghanbari, 2023; Wavrek, et al. 2023). This work aimed to: (i) verify whether VI can contribute to the identification of forest species; and (ii) determine which VI are most suitable for differentiating forest species. The study was carried out in a 2.76 ha forest area, composed of cork oaks and pine trees, located in Boicilhos, Coruche, Santarém. Eight trees of each species were randomly chosen, where a circular area of the same size was delimited in the central area. High-resolution multispectral images were captured using a MicaSense Altum sensor coupled to a DJI Inspire 2 drone. Vegetation indexes were calculated: NDVI (Normalized Difference Vegetation Index) (Rouse et al., 1974) MGRVI (Modified Red Vegetation Index) (Bendig et al., 2015), GLI (Green Leaf Index) (Eng et al., 2019) and MPRI (Modified Photochemical Reflectance Index) (Yang et al., 2008). NDVI did not prove to be a suitable index for forest differentiation. This index showed similar average and extreme values, which made it difficult to distinguish trees with more open canopies from trees with more closed canopies. The MPRI and MGRVI indexes were those that showed the greatest capacity to highlight species with a more open canopy (Barbosa et al., 2019), which made it possible to differentiate cork oaks from pine trees. For positive values of these indexes, it was found that: (i) in cork oaks, almost all MPRI values were between 0 and 0.4, while in MGVRI the distribution was equitable; (ii) in pine the MPRI showed an equitable distribution between values 0 and 0.4, while the MGVRI showed almost all values above 0.4. The GLI index showed similarities with the MPRI, but with a slightly larger distribution between 0 and 0.4.

Keywords: drone images; forest management; reflectance.

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WINTER COVER CROPS: EFFECT ON MAIZE YIELD

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ABSTRACT

The CAP 2023-2027 strategic plans aim to support a transition to a more sustainable, diversified and resilient agricultural sector. The use of cover crops during the autumn-winter period on fields that are usually left uncultivated can bring various benefits to soil health and fertility (Fontana et al., 2023; Miller et al., 2024). This work aims to: (i) check the influence of using peas as a cover crop on the productivity of maize as the main crop; and (ii) find out which of the following indices, NDVI (Normalized Difference Vegetation Index) (Rouse et al., 1974; Tucker, 1979), NDRE (Normalized Difference Red Edge Index) (Gitelson & Merzlyak, 1994) or MPRI (Modified Photochemical Reflectance Index) (Yang et al., 2008), can be better correlated with productivity. The study area, located in Herdade dos Boicilhos, Coruche, is made up of eight plots, each measuring 270 m^2. In four of these plots, peas (variety VADA) were used as a cover crop during the winter. The other four had no crops during the winter. In the eight plots, the main crop installed was corn (variety P0937). To carry out this work, drone images were used (DJI Inspire 2, equipped with a MicaSense Altum sensor) resulting from a flight realised on August 10th, 2023, during the panicle emission stage in maize. The peas were harvested on May 15th, then the maize crop was sown, which was harvested on September 29th. The results showed that: (i) on average, maize yield in plots with cover crops was higher than in plots without cover crops; and (ii) in all plots, with and without cover crops, NDVI was less capable of differentiating the vegetative vigour of maize at the panicle stage than NDRE and MPRI.

Keywords: drone images; MPRI; NDRE; NDVI; vegetation indexes.

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Funding

Project supported by PRR - Recovery and Resilience Plan and the NextGeneration EU European Funds PRR-C05-i03-I-000099.