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PHYSICAL ACTIVITY, HERITAGE, AND WELLBEING

Emerging Challenges

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PHYSICAL ACTIVITY, HERITAGE, AND WELLBEING: Emerging Challenges
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INTRODUCCION

Blended Intensive Programs (BIP) are one of the new and innovative formats of student mobility introduced by the new Erasmus+ 2021-2027 Program. These programs, jointly developed by multiple higher education institutions, feature advanced and innovative pedagogical approaches that combine short-term face-to-face (physical) mobilities with virtual learning. The combination of in-person and virtual learning allows students and professors experience and exchange highly collaborative, challenge-based, and research- steeped methods of teaching and learning.

The 1st Edition of the **PHYSICAL ACTIVITY, HERITAGE, AND WELLBEING: Emerging Challenges,** a BIP from Sport Sciences scientific area, was coordinated by Beja Polytechnic University (Portugal) and co-organized with "1 Decembrie 1918" University of Alba Iulia, (Romania), University of Huelva (Spain), Akademia Wychowania Fizycznego im. Bronislawa Czecha w Krakowie (Poland) and University of Jaén (Spain).

The BIP program include a IN-PERSON attendance period in a beautiful place in the middle of the countryside in the south of Alentejo (Beja, Portugal) from May 6th to May 10th, 2024. The international work group, focus on promoting an active and healthy lifestyle and explore the emerging challenges of the intersection of physical activity, heritage, and wellbeing, present the results on a Seminar that took place on 10th of May 2024 in the Polytechnic University of Beja, Portugal. This book of abstracts is the result of the work developed.

ORGANIZING COMMITTEE



COMMUNITY INTERVENTIONS FOR THE PROMOTION OF PHYSICAL ACTIVITY IN THE ELDERLY: BEST PRACTICES IN BAIXO ALENTEJO, PORTUGAL

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INTRODUCTION

One of the simplest and most effective methods for promoting physical activity is the development and implementation of community-based physical activity interventions and initiatives. Good practices are interventions or strategies that, based on scientific evidence and/or practical experience, demonstrate positive results in achieving the desired objectives. In the context of promoting physical activity in the elderly, good practices refer to programs, approaches or actions that have shown effectiveness in improving the health and well-being of this population (WHO, 2002; JANPA, 2015). We can admit that good practices are characteristics of initiatives, interventions or community programs, implemented in a real-life context and that are appropriate to their context of application, accepted by the target population and partners, effective, that produce good, efficient, sustainable, replicable, ethical and fair (CHRODIS, 2015; JANPA, 2015).

In the context of promoting physical activity in the elderly, good practices refer to programs, approaches or actions that have shown effectiveness in improving the health and well-being of this population. This study was designed with the objective of

evaluate community interventions that promote physical activity in a local/municipal context in Baixo Alentejo, Portugal[1].

METHODOLOGY

This cross-sectional study will evaluate ten physical activity community-based interventions (PACIs) (figure 1) using an instrument created by the National Program for the Promotion of Physical Activity (PNPAF, 2021).

Figure 1

Number of community physical activity programs to be evaluated (n=10)



This instrument evaluates existing good practices in interventions communities to promote physical activity. This tool was developed and structured with criteria of good practices and their respective considerations/evaluations (figure 2). The instrument presented herein has shown to be a user-friendly, low resource-demanding assessment of good practice criteria, including examples for each item that facilitate its use (Franco et al, 2021). Thus, it seems to be adequate to identify and evaluate good practices in local/municipal PACIs (Franco et al, 2021). This identification of good practices has the potential to help their dissemination on a regional or national scale. By being a more pragmatic tool and better adapted to the context in which community-based interventions take place, we expect it can contribute to foster the use of best practices in PACIs in the future.

[1] Up Again Senior Project (Instituto Português do Desporto e Juventude, I.P. - N.º CP/0519/DDT/2023)

Table 1

Assessment of Good Practices in Community Interventions (Franco et al, 2021; PNPAF, 2021).

Critérios de Boas Práticas			Avaliação (Ponderação)	
Especificação detalhada das características da intervenção principal, de forma a que esta possa ser replicada (55.5%)				
Descrição do racional sustentador da intervenção, incluindo evidência científica e/ou teoria			6.5% (3)	
Especificação e justificação* da população-alvo (*fatores de risco e fatores de suscetibilidade da população-alvo)			6.5% (3)	
Garantia de equidade no acesso e na participação na intervenção			6.5% (3)	
Especificação do(s) comportamento(s) a adquirir/alterar através da participação no programa			6.5% (3)	
Intervenção apresenta abordagem abrangente da promoção da saúde, atendendo a fatores pessoais, sociais e ambientais			5% (2)	
Descrição detalhada da intervenção	Especificação do local, número, duração e frequência dos contactos com os participantes e duração total do programa		6.5% (3)	1.69% (3)
	Descrição da forma de apresentação dos conteúdos			1.69% (3)
	Definição dos conteúdos/temas a abordar em cada sessão/módulo e sua relevância/pertinência			1.69% (3)
	Existência de um manual/guião/protocolo de apoio à implementação			1.43% (2)
Especificação e fundamentação• das técnicas de mudança comportamental utilizadas (•ligação da técnica com o construto teórico que pretende alterar)			5% (2)	
Existência de consentimento informado que respeite princípios éticos fundamentais			6.5% (3)	
Especificação do perfil dos profissionais envolvidos (qualificações e competências)			6.5% (3)	
Especificação detalhada das estratégias de monitorização e avaliação da intervenção (24.5%)				
Especificação e cálculo dos custos e financiamento do programa	Cálculo e especificação dos custos necessários para a realização da intervenção, incluindo o custo por participante (estimação adequada dos custos com recursos humanos, materiais e monetários)		5% (2)	3% (2)
	Apresentação dos custos relacionados com os benefícios para a saúde conseguidos (análise de custo-efetividade)			2% (1)
Especificação do delineamento da avaliação	Especificação dos indicadores de processo a avaliar		6.5% (3)	1.43% (3)
	Especificação dos indicadores de resultado a avaliar			1.43% (3)
	Especificação e fundamentação dos instrumentos/métodos de avaliação utilizados			1.43% (3)
	Especificação dos momentos de avaliação			1.43% (3)
	Existência de avaliação de *follow-up* e/ou avaliação continuada dos participantes			0.78% (1)
Apresentação dos resultados obtidos	Reporte dos resultados da avaliação de processo	Reporte das estratégias de recrutamento utilizadas e o seu alcance	6.5% (3)	1.43% (2)
		Reporte e análise das taxas de participação e de desistência nos vários momentos de avaliação		2.08% (3)
		Reporte da satisfação dos participantes relativamente à intervenção		1.43% (2)
		Monitorização e reporte de resultados/outcomes não planeados		0.78% (1)
		Aferição da consistência/fidelidade e reporte de adaptações feitas ao longo do programa		0.78% (1)
	Reporte dos resultados da avaliação de resultado	Cálculo e apresentação da magnitude dos efeitos (*effect sizes*)	6.5% (3)	1.3% (1)
		Resultados da avaliação face aos objetivos estabelecidos são reportados		2.9% (3)
		Monitorização e reporte de consequências negativas decorrentes da participação		2.3% (2)
Especificação detalhada das estratégias de implementação da intervenção (20%)				
Especificação das estratégias de implementação da intervenção	Existência de formação para os profissionais envolvidos em aspetos da implementação		6.5% (3)	1.95% (3)
	Especificação dos recursos humanos e materiais necessários para a implementação do programa			1.95% (3)
	Uso ou integração de recursos previamente existentes			1.95% (3)
	Definição e descrição das estruturas organizacionais da intervenção (e.g., fluxo de comunicação e trabalho, responsabilidades)			0.65% (1)
Existência de parcerias multidisciplinares e intersectoriais para o desenvolvimento e implementação do programa			6.5% (3)	
Definição de uma estratégia que permita manter o programa a longo prazo			5% (2)	
Aferição da capacidade de transferência do programa para outras populações ou contextos, tendo em conta as condições políticas, sociais e económicas			2% (1)	

To make it simpler to identify and respond to each intervention, for each of the requested good practice assessment criteria was developed, an open-ended questionnaire.

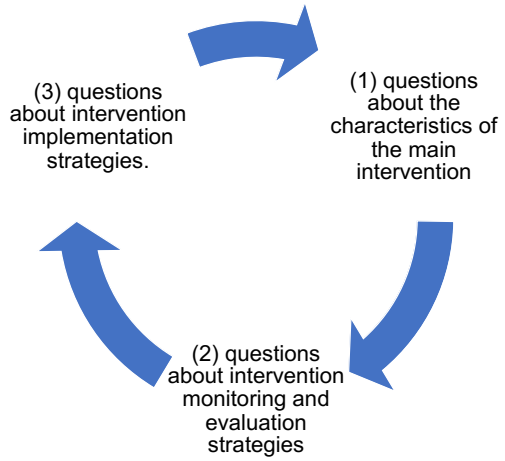
OUTCOMES

The study implied an assessment of community physical activity programs (PACIs) and will allow identification, recognition and appreciation of quality community

initiatives already existing in Baixo Alentejo, Portugal. The study will give us information about three topics: (1) questions about the characteristics of the main intervention, (2) questions about intervention monitoring and evaluation strategies and (3) questions about intervention implementation strategies (Figure 2).

Figure 2

The study will give us information about three topics.



We hope that this research can help in the definition of quality standards for PACIs, encouraging their dissemination and adoption at regional and national level.

KEYWORDS: Older Adults; Physical activity programs; Community; Health.

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SERVICE CONVENIENCE, SATISFACTION, AND WORD-OF-MOUTH AMONG FITNESS CENTRE CUSTOMERS: DIFFERENCES BETWEEN PT SUBSCRIBERS AND NON-SUBSCRIBERS

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INTRODUCTION

Fitness centres have become increasingly popular in recent years, with more and more individuals prioritizing their health and wellness (Foroughi et al., 2019). With the sector's growth, that have witnessed a segmentation of fitness centres, as well as a diverse range of services, with the goal of delighting and retaining clients. In this sense, personal training (PT) emerges as a service that offers personal guidance and physical training adapted to the individual needs of each client. This service is a premium service because the associated value is higher than that of a regular service in a fitness centre.

Despite the growing demand for this type of service and its inclusion in the top 10 fitness trends for 2023 (Franco et al., 2023), the variables that characterize and distinguish this service are still little explored.

To address this research gap, it is crucial for researchers to consider various factors unique to fitness services when studying consumer behaviour. As consequence, the purpose of this study is to determine whether there are any variations in service convenience and overall satisfaction between consumers who receive personal training and those who do not.

Furthermore, because we are dealing with a premium service, other objective is to know how these features influence the intent of word-of-mouth communication.

METHODOLOGY

This cross-sectional, quantitative study was based on the distribution of a questionnaire to customers of fitness centres, with the confidentiality of the information requested having been guaranteed beforehand. The data was collected between January and February 2024. The survey was carried out online using Microsoft Forms. The sample included 354 members of fitness centres in Portugal, 65% female and 35% male. The average age of the members was 41.38 (±11.99) years. Of the 354 members, 132 (37%) have PT services and 222 (63%) do not. The questionnaire included 12 questions to assess service convenience (Sun & Pan, 2023), three questions to assess Word-of-Mouth intentions (Sun & Pan, 2023) and three questions to assess global satisfaction (Ferreira Barbosa et al., 2022). The response scale varied between 1 (Maximal disagreement) and 7 (Total agreement) to service convenience and Word-of-Mouth intentions scales. For the scale of overall satisfaction with the service, responses ranged from 1 (Totally Dissatisfied) to 7 (Totally Satisfied).

The data was analysed using SPSS 28.0. Descriptive statistics (mean, standard deviation, and absolute differences), inferential statistics (Student's t-test), and multiple linear regression were used. The significance level was 5%.

RESULTS

Table 1 shows the differences between customers with and without PT service for the constructs service convenience, overall satisfaction, and word-of-mouth intention. Customers generally gave positive ratings to the various aspects of the service, including overall satisfaction, word-of-mouth communication intents, and convenience, whether they had a personal training service or not. In terms of service convenience, there were statistically significant differences for the constructs benefits and post-benefits (p<0.05). On average, customers who have a PT service have a higher perception of benefits and post-benefits of the service. Customers who subscribe to the personal training service have, on average, greater overall satisfaction with the service

and report, on average, a greater intention to communicate the service to others (p<0.05).

Table 1

Service convenience, overall satisfaction, and word-of-mouth intentions in customers with and without PT services.

Constructs		PT		Without PT		*p*
		M	SD	M	SD	
Service Convenience	Access	6.55	±099	6.56	±0.83	0.388
	Transaction	6.25	±2.12	6.14	±1.17	0.268
	Benefit	6.57	±1.00	6.35	±1.09	0.023*
	Post-benefit	6.51	±1.02	6.34	±1.03	0.025*
Overall Satisfaction		6.68	±0.91	6.43	±1.09	0.008*
Word-of-Mouth Intention	intentions	6.70	±0.81	6.55	±0.93	0.026*

* p<0.05 | M – Mean | SD – Standard Deviation | PT – Personal Training

Multiple linear regression was used to determine the influence of the variables of service convenience and satisfaction on word-of-mouth intention. Table 2 shows the model that explains word-of-mouth communication intention among customers who subscribe to the personal training service.

Table 2

Multiple linear regression of predictors of word-of-mouth intention for customers with personal training services.

	Beta (ß)	t	*p*
Access	-.254	-2.281	.024
Transaction	.039	.459	.647
Benefit	.396	3.459	<.001
Post-benefit	.119	.961	.338
Overall Satisfaction	.566	8.414	<.001

Table 3 shows the model of predictors of word-of-mouth intention for customers without personal training service. The model for customers who have a personal training service explains 61.8% of the intention to communicate by word of mouth and the model for customers who don't have personal training explains 49.3% of this intention.

Table 3

Multiple linear regression of predictors of word-of-mouth intention for customers without personal training services.

	Beta (ß)	t	*p*
Access	-.002	-.028	.978
Transaction	-.018	-.253	.801
Benefit	.234	2.081	.039
Post-benefit	.164	1.464	.145
Overall Satisfaction	.408	6.667	<.001

CONCLUSIONS

Because of the status it represents, regardless of the type of fitness centre, all organizations hope to see a rise in subscribers to the personal training program. Convenience, quality and safety are characteristics appreciated by customers who use this service (Alves et al., 2018). Furthermore, through this study we concluded that customers who have a PT service have higher perception of benefit and post benefit service compared to customers who don't have this service.

The benefit dimension (convenience of the service) and overall satisfaction with the service predict future intentions for both PT subscribers and non-subscribers. Other research conducted at fitness centres have revealed a link between customer satisfaction and behavioural intention (Baena-Arroyo et al., 2020). This is especially important for consumers who use PT services because their level of satisfaction is higher than that of those who do not, resulting in more positive communication about the service.

KEYWORDS: Service Convenience; Customer Satisfaction; Word-Of-Mouth Intention; Fitness Centre; Personal Training.

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EVALUATION OF THE PORTUGUESE HOMELESS FOOTBALL NATIONAL TEAM'S TRAINING LOAD AND OVERREACHING RISK

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INTRODUCTION

The ability to monitor training is necessary for the process of quantifying training periodization programs. Heart rate (HR) based internal training load (iTL) assessments and the session-rating of perceived exertion (RPE) approach have proven to be highly effective and precise monitoring tools for measuring iTL in a number of team sports. High training monotony and high TL are correlated with negative training responses.
The aim of this study was to assess, objectively and subjectively, accumulated iTL during the preseason (10 days; 16 total practice sessions) and risk of overreaching, for the Homeless World Cup 2023 which took place in Sacramento.

METHODOLOGY

Eight homeless soccer players (f=2; Mean ± SD age: 29.4 ± 5.8 years; height: 172.6 ± 10.5 cm; body mass: 73.3 ± 11.3 kg) belonging to Portuguese national soccer team participated in this study. The peak HR was assessed using the Yo-Yo Intermittent Endurance Test level one. RPE and HR were analyzed every training session to calculate iTL (iTL: RPE-TL and Edward's-TL).

RESULTS

On average, each player contributed 15.3 sessions of data to the analysis. Statistically significant correlations between RPE-TL and Edward's-TL ($r = 0.88$; $p < 0.001$), and monotony ($r = 0.98$; $p < 0.001$) were found for all individual players.

CONCLUSIONS

TL monitoring enabled us to assist national team coaches in managing athletes' compliance with training schedules and their physical stress management, which led to an excellent fourth place in the 18th edition of the Homeless World Cup 2023. This study confirms that RPE-TL is a low-cost, easily managed technology that evaluates an individual's iTL to the homeless football practice in a highly useful and accurate method. Moreover, given the vast amount of people that participate in street team sports globally, this tool could have a significant effect on a significant proportion of the international sports community.

KEYWORDS: Training load, Overreaching, Injury prevention, heart rate, RPE

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DIAGNOSTIC AND PRESCRIPTION OF STRENGTH TRAINING IN PATIENTS WITH TYPE 2 DIABETES - INTERVENTION AND COST/BENEFIT OF THE EXERCISE PHYSIOLOGIST FOR THE NATIONAL SERVICE OF HEALTH

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INTRODUCTION

Including exercise physiologists in the Health National System (HNS) would have positive results for public health. Considering the studies of Tuomilehto (2001) and Soan et al. (2022) it was possible to achieve primary prevention of type 2 diabetes through a non-pharmacological intervention that can be implemented in a primary healthcare setting. Strength training has been recommended by the world's leading sports and health organisations as a form of treatment for type 2 diabetes mellitus. There has even been a considerable increase in the number of studies about the subject (Pedersen & Saltin, 2015). In order for the benefits of strength training to be optimised Ruivo (2022) considers it necessary for the prescription of strength training to be specific and in line with the individual's characteristics.

This study's aims to evaluate, in a real context, the health benefits of individualized and proximity clinical exercise (strength training) in patients with type 2 diabetes and a prediction of impact on reducing the costs in Health National System (HNS) with this population.

METHODOLOGY

This study embraces an experimental research design with a total of 15 patients' participants. Eight patients (GI, n=8) with type 2 diabetes, aged between 46 and 65, with a glycated hemoglobin of over 6.5% and on pharmacological therapy, and seven patients in the same clinical condition, the control group (CG, n=7), were referred for strength training by their family doctor. This intervention lasted 12 weeks. This study included variables, such as: assessment of body composition using bioimpedance (weight, body mass index, % of body fat mass, % corporal water, muscle mass, bone mass, visceral fat, metabolic age), waist circumference and analysis of glycated hemoglobin in both groups. In the intervention group, we also assessed cardiorespiratory fitness, using the submaximal test - 1-mile walk test; functional assessment, the NASM Overhead squat, shoulder mobility and ankle mobility. To assess muscle strength in the upper and lower limbs, we used the Landers/N.F.L. test. For the upper limbs we performed the bench press and for the lower limbs the squat exercise. To assess abdominal strength the curl-up test was used. This assessment was necessary for prescribing exercise for the intervention group, which underwent two sessions a week, with 40-minute training each session. The patients were monitored on an individual basis, respecting all the comorbidities associated with the disease.

RESULTS

In the control group, there were no significant differences at the beginning or end of the period. As far as the intervention group is concerned, there was a significant difference between the initial and final periods in most of the variables under study (decrease in % body fat, increase in % water, increase in muscle mass, increase in bone mass, decrease in metabolic age, decrease in waist circumference and decrease in glycated hemoglobin values). All the intervention patients showed improved cardiorespiratory capacity and increased upper and lower limb strength.

CONCLUSIONS

This study has shown that strength training can act as a non-pharmacological therapy in the treatment of type 2 diabetes and also act as prevention and treatment of risk factors related to type 2 diabetes. The inclusion of the exercise physiologist, who is specialise in prescribing clinical exercise in an interdisciplinary approach, in the Portuguese primary health care environment has made it possible to improve the health of patients and in some patients to reduce medication for diabetes and other associated comorbidities among the research volunteers. Therefore, this study concludes that strength training is viable and effective in helping to treat type 2 DM, when properly prescribed and monitored individually by an exercise physiologist, as part of a multidisciplinary team, which optimises the benefits of strength training and has led to a reduction in costs for the SNS with this population and for the patient themselves.

KEYWORDS: Exercise physiologist; Interdisciplinary team; Strength training; Primary health care; Chronic non-communicable disease.

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FACTORS RELATED TO CHRONIC LOW BACK PAIN IN PORTUGUESE FIREFIGHTERS

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INTRODUCTION

Working as a firefighter is physically demanding, as you have to manoeuvre heavy weights and use special equipment. These characteristics of the occupation can lead to musculoskeletal injuries that affect performance. This study therefore aims to identify the prevalence of chronic low back pain (LBP) in Portuguese firefighters and to understand which lifestyle factors may be associated with this condition.

METHODOLOGY

This is a quantitative, cross-sectional study involving 420 Portuguese firefighters (94.8% male) aged between 22 and 67 (39.78±9.99). LBP was defined as the presence of pain for at least the last three months. Weight and height were self-reported. The level of physical activity and sitting time was assessed using the IPAQ (Craig et al., 2003). Sleep quality was assessed using a Likert scale (Del Rio João et al., 2017) and the number of hours of sleep per day was asked. The statistical treatment was carried out using SPSS and the significance level used was 5%.

RESULTS

Of the firemen who participated in the study, 60.2% had LBP, and 63.6% had been suffering from it for at least 24 months. Firefighters who reported CLBP were older and had been in the profession for more years compared to those who did not (p<0.05).

Except for sleep quality, which was lower in firefighters with CLBP (c^2=9.974; p=0.019), no other characteristics were significantly different between those with and without LBP.

CONCLUSIONS

The prevalence of LBP is very high compared to that found in the rest of the Portuguese population and tends to increase with years of work in the sector. In this sense, progression in the profession should be accompanied by exercise programs that prevent the development of low back pain.

KEYWORDS: Chronic Low Back Pain, Physical Activity, Sleep, Firefighters

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MUSCULOSKELETAL SYMPTOMS, QUALITY OF LIFE, STRESS, AND ANXIETY ON ADULTS. DESIGN OF AN WORKPLACE EXERCISE PROTOCOL INTERVENTION

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INTRODUCTION

With increasing concern for the well-being of employees in the workplace, the implementation of occupational gymnastics programmes has been an increasingly explored approach. Occupational gymnastics is understood to be guided physical exercise practised during working hours, with the aim of minimising the negative impacts of a sedentary lifestyle on workers' lives and health (Martins & Barreto, 2007). Musculoskeletal symptoms, such as back, neck, shoulder, and limb pain, are common among workers who spend long hours in front of computers or performing repetitive tasks (Asas et al, 2011). These symptoms not only affect individuals' quality of life but can also lead to a decrease in productivity and an increase in sick leave in the workplace. Workers' quality of life is directly related to their physical and mental health. Chronic pain and musculoskeletal discomfort can negatively affect the ability to carry out daily activities and interfere with personal and professional relationships. It is therefore important to investigate how interventions such as occupational gymnastics can improve workers' quality of life. The work environment can be a significant source of stress and anxiety for many employees. Work overload, tight deadlines, and pressure to meet targets can all contribute to increased stress and anxiety (Trindade et al, 2018; Tveito et al, 2013). Occupational gymnastics can be an effective strategy to help workers deal with these stress factors and promote a healthier and more harmonious working environment. In addition to the individual benefits for workers, implementing a

gymnastics programme can bring advantages for the organisation, such as reducing the costs associated with absenteeism, increasing productivity, improving the organisational climate, and reducing the number of accidents at work (Pagliari, 2002; Silva et al., 2021).

According with the above, the aim of this research is to assess the musculoskeletal conditions, quality of life, stress levels and anxiety of workers and design an occupational gymnastics programme.

METHODOLOGY

This cross-sectional study will be performed with employees of Loulé City Council. Data collection involved administration of a questionnaire that includes three scales: the *Nordic musculoskeletal questionnaire* to assess musculoskeletal conditions (Mesquita et al., 2010), the *Health and Well-being scale* (Silveira et al., 2013) to assess quality of life, and the *HADS - Hospital Anxiety and Depression Scale* (Pais-Ribeiro et al., 2007) to assess stress and anxiety. The questionnaire will be available to employees through an online link. Weight (kg) and height (cm) measurements were performed by the researchers according to the standard procedures. The confidentiality of the data collected and its exclusive use for research purposes will be guaranteed.

Considering the musculoskeletal conditions, quality of life, stress levels and anxiety of workers, a six-week compensatory gymnastics programme will be design. This study was approved by the Ethics Committee of the Polytechnic University of Beja (Portugal), reference n. º 1/2024. The design complies with Portugal regulations on clinical research in humans (Law 21/2014 of 16 April), with private data protection regulations (Law 58/2019, 59/2019 and Law 41/2004), and with the principles of the Declaration of Helsinki (2013, Brazil).

RESULTS

We hypothesize that 6 weeks of a workplace exercise program, is a good strategy to promote physical activity and consequently increase the social well-being, reduce risk factors and protect the health of workers.

CONCLUSIONS

Studying the musculoskeletal symptoms, quality of life, stress and anxiety in workers is highly relevant from the point of view of occupational health, worker well-being and organisational performance. Physical activity is considered a key factor in the prevention and control of chronic, non-communicable diseases. Research can provide valuable information that can guide human resource management policies and practices aimed at promoting health and quality of life in the workplace.

KEYWORDS: Health; Physical Activity; Quality of Life; Musculoskeletal Disorders; Stress and Anxiety; Occupational Gymnastics.

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PLOGGING, PHYSICAL ACTIVITY, HEALTH AND WELLBEING

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INTRODUCTION

Plogging is a blend of “plocka up”, which means “picking up grain” in Swedish, and “jogging”, which motivates picking up trash while jogging (Raghavan et al, 2022). Recent research show that living close to or interacting with nature promotes benefits for numerous indicators of health and well-being. Plogging is a civic practice that combines physical activity (running or walking) with environmental concern by picking up litter along the way and can be done in any context (green spaces, blue spaces, urban, etc.). This activity has gained popularity around the world due to its benefits for both personal health and the environment, namely physical, environmental and sustainability benefits (Beckman, Whaley & Kim, 2017; Larson et al., 2018; Rahdari & Anvary, 2015).

There have been few studies on Plogging, which lends relevance and innovation to the current research and could open up new paths or approaches to the subject. The aim of this research is to measure the impact of Plogging on the promotion and improvement of physical activity, health and well-being of practitioners. With this in mind, we also pretend to disseminate Plogging as a practice that can be recognized and valued for its benefits for the individual and its positive impact on the environment and the community.

METHODOLOGY

Data collection was carried out through an online questionnaire, applied between April and May 2024, built on the Lime Survey platform, consisting of a sociodemographic form, the IPAQ questionnaire (International Physical Activity

Questionnaire (adapted)), the WHO-5 Well-Being Index questionnaire, the Subjective Happiness Scale and the Well-Being and Quality of Life Questionnaire (The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)) Pre and Post Plogging (adapted).

The convenience sample includes 235 informal participants who voluntarily take part in activities carried out in specific natural contexts, organized by Plogging groups, entities associated with the movement (clubs, associations, companies, surf schools, ...) or simply individuals who regularly practice the activity.

RESULTS

Evidence shows that being active in natural environments can result in greater and faster improvements in quality of life than being active in other contexts. With this study, we expect to highlight the importance of study and promote plogging as an effective and low-cost way of increasing physical activity and preserving the environment.

There is no clear idea of how to approach the plogging movement, whether it should be seen as a simple event, a small practice in everyday life for environmental protection, or the starting point of a wider social movement.

When local governments or environmental groups take the lead in organizing and planning plogging, the pure essence of the exercise is lost, making it look like an environmental protection activity or a politically motivated exercise (Lee & Choi, 2023).

CONCLUSIONS

Plogging on a continuous and systematic basis can be a way of doing physical activity to increase physical fitness, health and well-being. If that is the case, it can be integrated into community programmes that provide outdoor education and therefore a way to optimise the benefits of active interaction with the environment. In addition, these programmes can also change people's attitudes towards nature, which in turn can result in greater individual and community support for pro-sustainability policies and practices with a potential impact on planetary health.

KEYWORDS: Plogging; Physical Activity; Health; Well-being.

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MOTOR COMPETENCE IN PRE-SCHOOL EDUCATION AND THE IMPORTANCE OF ENVIRONMENTS THAT PROMOTE PHYSICAL LITERACY

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INTRODUCTION

The years of Preschool Education are vital for shaping health-related behaviors, such as physical activity. The motor skills acquired at this stage are essential for personal development. Motor competence, the ability to be proficient in a variety of motor skills, is decisive for participation in physical activity. Also, can be described as a person's ability to be proficient in a variety of acts or motor skills (Cattuzzo et al., 2016). The relationships established and the development of motor skills in early childhood are central aspects of the development of this stage of life, which have a positive and preponderant influence on both the mental and physical health of children (Sommer-Himmel & Titze, 2018). Motor competence becomes fundamental for children's physical literacy. A greater motor competence allows the child to have a greater motor repertoire, which will allow them to engage in a greater number of activities in a positive and successful way (positive cycle), contributing to physical literacy (Loureiro et al., 2024).

The present study aimed to characterize motor competence preschooler children, according to their geographic origin and gender.

METHODOLOGY

Quantitative cross-sectional study, with a non-probabilistic sample involving of 45 children, aged 3 to 6 years, from Beja and Odemira, Portugal. The motor competence

was evaluated with the MOBAK-KG battery («Motorische Basiskompetenzen im Kindergarten»), which includes eight tests; manipulative area (grabbing, throwing, dribbling and driving) and locomotor area (balance, rolling, jumping and running) (Herrmann et al., 2018). The score for each test varies between zero and two points: insufficient development (0), sufficient (1) and good development (2).

Figure 1

Bateria de testes MOBAK-KG «Motorische Basiskompetenzen im Kindergarten»)



The significance level established was $p<0.05$. Analyzes were performed using SPSS (v.28.0 for Windows, SPSS Inc., Chicago, IL).

RESULTS

The children involved in the study presented a sufficient level in general motor competence (53.3%), manipulative motor competence (42.2%) and locomotor motor competence (51.1%), table 1.

Table 1

Comparison of the classification of manipulative, locomotor and general motor competence (n=45)

Motor proficiency	Manipulative MC*	Locomotor MC*	General MC*
	n (%)	n (%)	n (%)
Insufficient	18 (40%)	15 (33,3%)	17 (37,8%)
Sufficient	19 (42,2%)	23 (51,1%)	24 (53,3%)
Good	8 (17,8%)	7 (15,6%)	4 (8,9%)

Note. *MC, motor competence.

Considering gender, there were significant differences between children from Beja (urban) and Odemira (rural) in the proficiency of some motor skills. The boys from Beja showed greater proficiency than those from Odemira in HM throwing (M=1.3±0.9; M=0.4±0.5; p= 0.036), jumping (M=1.4±0 .5; M=0.9±0.8; p= 0.048), dribbling (M=1.3±0.5; M=0.8±0.8; p= 0.014), rolling (M=1 .8±0.4; M=0.4±0.7; The girls from Beja showed greater motor proficiency than those from Odemira in HM throwing (M=1.3±0.7; M=0.4±0.5; p= 0.015) and rolling (M=1.7± 0.5; M=0.8±0.9; p<0.012).

Table 2.

Differences in the manipulative and locomotor motor competence considering geographic origin and gender.

		Masculine					Feminine				
		Beja		Odemira			Beja		Odemira		
Subarea		**M**	**SD**	**M**	**SD**	***p***	**M**	**SD**	**M**	**SD**	***p***
Manipulative	Throwing	**1,3**	**0,9**	**0,4**	**0,5**	***P=0,036****	**1,3**	**0,7**	**0,4**	**0,5**	***P=0,015****
	Catching	1,2	0,7	1,3	0,9	P=0,258	1,1	0,8	1,6	0,8	P=0,141
	Bouncing	**1,3**	**0,5**	**0,8**	**0,8**	**P=0,014***	1,3	0,5	1	0,8	P=0,232
	Dribbling	1,3	0,6	1,2	0,8	P=0,294	1,3	0,5	0,9	0,7	P=0,220
Locomotor	Balancing	1	1,0	0,6	0,9	P=0,204	0,7	1	0,7	0,9	P=0,403
	Rolling	**1,8**	**0,4**	**0,4**	**0,7**	**P<0,001*****	**1,7**	**0,5**	**0,8**	**0,9**	**P=0,012***
	Jumping	**1,4**	**0,5**	**0,9**	**0,8**	**P=0,048***	1,1	0,6	1,3	0,9	P=0,089
	Running	1,6	0,5	1,2	0,4	P=0,110	1,6	0,5	1,4	0,7	P=0,631

Note. SD=standard deviation

CONCLUSIONS

The children presented median values of overall motor competence and in each of the locomotor and manipulative areas. Considering the geographical origin, there were higher levels of motor proficiency in the urban context than in the rural context. Boys showed greater proficiency in motor skills throwing, jumping and dribbling and rolling. Girls showed greater proficiency in motor skills throwing and rolling. More studies are needed to understand the influence of contexts on the motor competence of children at an early age, in order to promote good motor development and contribute positively to physical literacy.

KEYWORDS: Children; Education; Motor Skills; Physical Literacy; MOBAK-KG.

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NATURE SPORTS PRACTITIONERS – ANALYSIS OF THE IMPACT IN LOCAL AREAS

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INTRODUCTION

The evaluation of Nature Sports and consumer behavior in places where they are practiced is increasingly emerging, given the different impacts that this type of practice can have on territories (Van Rheenen & Melo, 2021; Rosa et al., 2017). Some evidence has shown positive signs of the adoption of behaviors through the experience of certain situations and specific natural contexts. Nature sports practices have revealed some evidence of their impact on the territories (Rosa et al., 2017), although it is not always clear to what extent and magnitude these effects are studied and framed in the dynamics of the places (Bento & Murta, 2021).

In this study, we will evaluate the impacts of nature sports and consumer behavior in the different natural places where they are practiced, the frequency, regularity, times of year, week and day, duration of practice, the importance attributed to practicing this type of sport and the socio-demographic characteristics that influence the practice (Rosa et al., 2022).

METHODOLOGY

The convenience sample includes 304 clients of active tourism companies and nature sports practitioners. Data collection was performed in an online questionnaire survey applied between February and April 2024 built on the *Google* platform and adapted from (Melo, 2013). For this study we use a quantitative research methodology.

RESULTS

Through this study we hope to underline the importance of continuing to study nature sports and their importance for tourism and local areas, but also for government strategies trying to educate the population, clients and practitioners to respect the environment and the areas where this type of sport takes place.

CONCLUSIONS

Despite having many characteristics in common, the different types of nature sports activities can differ in terms of participation, which gives each of them a unique profile, depending on the characteristics of each type of activity (location, type of activity, socio-organizational scope), but also on the socio-demographic characteristics of its practitioners.

KEYWORDS: Nature Sports; Local Areas; Consumer Behavior.

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DESIGN OF A RESISTANCE TRAINING PROTOCOL FOR UP AGAIN SENIOR OLDER ADULTS BASED ON CERT

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INTRODUCTION

The multifactorial and inevitable biological process of aging leads to a natural decline in physical function in older adults. This process, characterized by intrinsic physiological changes and extrinsic factors, results in decreased muscle strength, power, endurance, flexibility, and motor coordination (Park et al., 2023). This loss of functional capacity can lead to a range of comorbidities, frailty, and dependence, negatively impacting the quality of life and longevity of older adults (Cruz-Jentoft, et al., 2019). This study will aim to present the Consensus on Exercise Reporting Template (CERT) of an RT program that will investigate the effects on physical function of older adults.

METHODOLOGY

Ten untrained and apparently healthy participants were recruited (M=74±3,19 years) and will participate twice a week (60 min/session) in a 12-week RT protocol. The RT is composed of two sets of 10 to 12 repetitions of seven exercises for the major muscle groups with 90s of passive rest between sets. The intensity will be set within five to six on rate of perception exertion scale (RPE) to adjust the external load. After six weeks, three sets of 8 to 10 repetitions within an RPE of seven to eight will be performed. A group-based format RT will be used with bodyweight and free-weight exercises, the exercises will be adapted to individual features. Sessions will be

supervised and performed at the Polytechnic University of Beja. The RT protocol report follows CERT (Consensus on Exercise Reporting Template).

RESULTS

At pre- and post-intervention, the study implied an assessment of health and anthropometric characteristics (resting blood pressure, body composition), physical function tests (sit-to-up 30s, timed-up and go test), and muscle strength and power tests (handgrip, isometric peak force, jump height, centre of pressure). SARC-F questionnaire will be measured. During the sessions, the repetitions and load, the RPE and the feeling scale will be recorded. The adherence will be reported, as well as the adverse events.

CONCLUSIONS

It is expected, based on prior research, (i) improvements in physical function and balance measures (ii) a general positive affective response, (iii) a high adherence rate, and (vi) without differences in body composition.

KEYWORDS: Older Adults; Physical Function; Power; Resistance Training.

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ANALYZING THE EFFORTS OF AMATEUR FOOTBALL PLAYERS IN COMPETITION

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INTRODUCTION

Over the years in different studies, several methodologies being used, and the average distance covered during a professional game has remained (Varde'i et al., 2020). Many studies focus on the intensity profile of the professional football players, but few examine the amateur players effort during the competition (Izzo & Carrozzo, 2015; Izzo, & Varde'i, 2017; Izzo, De Vanna, & Varde'i, 2018).

The aim of this study was to characterize the effort of amateur football players and compare it with the values achieved by professionals. We seek the knowledge for training these players and contribute to increased research in the amateur setting.

METHODOLOGY

The study involved players who played in an amateur club of the first district division in the Beja Football Association (Portugal), these players were selected for a convenience sample, considering a minimally adequate level of preparation from a physical and technical point of view.

The sample was comprised of 10 amateur football players, with heights between 1,71m to 1,93 m, weight ranged from 74 Kg to 85 kg and with a BMI of 18,5 to 24,9 kg/m^2.

For data collection, we use GPS devices (Catapult One) in each player during 4 games. We focused our study on 4 variables: Total Distance (Km), Sprint Distance (m), Top Speed (m/s) and Power Actions (f).

Several statistical tests were used, to identify differences in variables between games we applied a Friedman test, to find differences between sectors we use the Kruskal-Wallis test, to relating data to the playing time of each player in each game we applied Quade's ANOVA, to meet differences between the Central Defenders and Lateral Defenders positions we used a Mann-Whitney test.

RESULTS

About the variables under study, we were able to record their metrics, their average values, and their variability: Total Distance (7.89±1.19), Sprint Distance (573.03±237.6), Top Speed (7.61±0.47) and Power Actions (41.58±13.12). Given the reduced variability of the Total Distance and Top Speed we can say that the values can indicate a pattern of effort in the amateur setting. The variables of Sprint Distance and Power Actions seem to be more dependent on situational factors and the importance of the game (Izzo, Franco & Varde'i, 2018).

No statistically significant differences were found between the 4 games in the different variables: Total Distance ($p=0.439$), Sprint Distance ($p=0.204$), Top Speed ($p=0.259$) and Power ($p=0.104$), showing relative stability from game to game, reinforcing the idea of an effort pattern.

The difference presented considering the sectors was not statistically significant for the variables: Total Distance ($p=0.875$), Sprint Distance ($p=0.837$), Top Speed ($p=0.393$) and Power ($p=0.957$), probably the lack of specialization of the amateur player does not allow finding that much difference (Vickery & Harkness, 2017).

When we related Time played to km covered, we also found a lack of significance in the different variables: Total Distance ($p=0.846$), Sprint Distance ($p=0.828$), Top Speed ($p=0.611$) and Power ($p=0.900$), and the differences between the positions of Central Defenders and Lateral Defenders, were not statistically significant ($p=0.667$) as we expected, factor that may have been influenced by the teams' playing style (Vickery & Harkness, 2017).

CONCLUSIONS

We conclude that is possible to establish an effort standard for amateur football players during the competition and with-it bring knowledge to their preparation. We identified that amateur football players cover shorter distances when compared to professional players. The effort indicators showed reduced variability regardless of the different games, sector, or position, which may be a characteristic of amateur football.

KEYWORDS: Soccer; Amateur; Players; GPS; Effort.

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RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR AND HAPPINESS IN ACTIVE PEOPLE

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INTRODUCTION

An important aspect in the relationship between physical activity and health is associated with question of the ability of physical activities to lead people to a greater state of happiness (Peres et al, 2019). Although it is complex to define happiness, and studies have established positive correlation between physical activity and happiness and greater life satisfaction (Monteiro et al, 2014).

In common sense, physical activity and exercise are considered synonymous, however, their meanings are different. Physical activity is a broad term that can be defined as any movement of the body, realized by skeletal muscle, which results in energy expenditure (Peres et al, 2019; Caspersen et al, 1985).

The terms happiness and subjective well-being are usually defined as synonymous and identical in nature, since both characterize the study objectives of Positive Psychology. However, happiness is used as a more general term, while subjective well-being presents greater precision. Subjective well-being is determined by the individual's experiences of well-being, where he himself evaluates his life classifying it as positive or negative according to subjective criteria. Subjective well-being (SWB) is one of the components of Mental Health, the focus of Positive Psychology, constituting a complex concept characterized by individual experience and subjective well-being of the individual, who self-evaluates his life positively or negatively, through the criteria of life satisfaction and positive and negative effects (Silva, 2017).

The relationship between the physical activity and the perspective of happiness, which involves several complex components, is a research area notably limited, and it is necessary to investigate, in more depth, the interfaces of these variables. Based on the previous assumptions, with this study we intend to characterize the level of physical activity, sedentary behavior and the level of happiness by verifying the relationship between variables.

METHODOLOGY

This cross-sectional study includes a convenience sample with 72 participants aged between 23 and 73 years old, 49 females and 23 males. All the participants were active, with regular exercise between 1 to 6 times a week. The participants enrolled Personalized Training (n=34) and High-intensity Training (n=38).

To measure anthropometric variables (Weight/Height/Body Mass Index), a Tanita BC-545N scale and a SECA stadiometer were used. To assess physical activity, we used the International Physical Activity Questionnaire - short version (IPAQ - short version) (Craig et al., 2003) and to assess happiness, we used the Subjective Happiness Scale (SHS). The SHS is a scale translated and validated into Portuguese by Spagnoli et al. (2010), systematized in four global subjective happiness items. Two of these items ask to the person to characterize themselves according to the people around them and their personal perception, the remaining items offer brief descriptions of what happy and unhappy individuals are, the person being evaluated in these items has to classify themselves where they are (Spagnoli et al 2010; Lyubomirsky & Lepper, 1999).

The questionnaires were distributed to participants via a link and responses were collected between January 25th and February 2nd, 2024. The collected data were subsequently processed in Excel and SPSS. The data was analysed using SPSS 28.0. Descriptive statistics (mean, standard deviation, and absolute differences) and inferential statistics were used. The significance level was 5%.

RESULTS

No significant relationships were found between the level of PA and the variables under study (gender, BMI, sedentary behavior, type of physical activity and level of happiness). The majority of the sample has a high level of PA (76.4%). Among participants with a high level of PA, 73.6% also present non-sedentary behavior and with regard to their perception of happiness, 15.3% consider themselves "Happy" and 59.7%, "Extremely Happy". A significant relationship (p=0.020) was found between the level of happiness and non-sedentary behavior, in which 93% of "Happy" (23.6%) and "Extremely Happy" (69.4%) individuals exhibit non-sedentary behavior.

Table 1

Physical Activity, Sedentary Behavior and Level of Happiness (n=72).

Physical Activity Level		**Low (6)**	**Moderate (11)**	**High (55)**	***p***	**Seden. (4)**	**Not Sedent. (68)**	***p***
Variables		**n (%)**	**n (%)**	**n (%)**		**n (%)**	**n (%)**	
Gender	Female	4 (5,6%)	9 (12,5%)	36 (50%)	0,567	2 (2,8%)	47 (65,2%)	0,425
	Male	2 (2,8%)	2 (2,8%)	19 (26,4%)		2 (2,8%)	21 (29,2%)	
IMC	Healthy	1 (1,4%)	8 (11,1%)	30 (41,7%)	0,085	3 (4,2%)	36 (50%)	0,390
	Overweight	5 (6,9%)	3 (4,2%)	25 (34,7%)		1 (1,4%)	32 (44,4%)	
Sedentary Behavior	Sedentary	0 (0%)	2 (2,8%)	2 (2,8%)	0,130			
	Not Sedent.	6 (8,3%)	9 (12,5%)	53 (73,6%)				
PA Level	Low					0 (0%)	6 (8,3%)	
	Moderate					2 (2,8%)	9 (12,5%)	0,130
	High					2(2,8%)	53 (73,6%)	
PA Type	HIIT	2 (2,8%)	5 (6,9%)	31 (43,1%)	0,489	3 (4,2%)	35 (48,6%)	0,360
	PT	4 (5,6%)	6 (8,3%)	24 (33,3%)		1 (1,4%)	33 (45,8%)	
Happiness Level	Unhappy	0 (0%)	1 (1,4%)	1 (1,4%)	0,066	**1 (1,4%)**	**1 (1,4%)**	**0,02***
	Happy	1 (1,4 %)	6 (8,3%)	11 (15,3%)		**1 (1,4%)**	**17 (23,6%)**	
	Extr. Happy	5 (6,9%)	4 (5,6%)	43 (59,7%)		**2 (2,8%)**	**50 (69,4%)**	

CONCLUSIONS

We concluded that, in this study, physical activity is not an indicator of a higher level of happiness, on the other hand, the time spent in sedentary behavior is directly related with lower levels of happiness. In this study, participants with healthier behaviors have higher levels of happiness.

KEYWORDS: Physical activity; Happiness; Well-Being; Sedentary behavior.

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CREATING OUTDOOR ACTIVITIES THROUGH THE CONCEPT OF ADVENTURE PEDAGOGY MODEL IN PORTUGUESE HIGHER EDUCATION SYSTEM

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INTRODUCTION

Pedagogical models in physical activity have gained relevance in recent decades (Caballero-Blanco et al., 2020; Fernández-Río et al., 2021). These structures support teachers in organizing different elements involved in teaching-learning processes to achieve expected learning outcomes. Among other reasons, they a) attend the needs felt by teachers and coaches when creating greater experiences of success in participants, b) show sport from different perspectives, c) increase commitment to physical activity and d) promote students' individual and collective health. These emerging models include Adventure Pedagogy (AP) (Caballero-Blanco et al., 2020; Parra et al., 2009), based on the hypothesis of Adventure Education (an approach grounded on challenge and adventure as an essential component of activities) and Outdoor Education as attitudes that emphasize activities in nature. This article presents a solution using the AP model – "Adventures in the Gaul Village", since the common thread was the Gaul and Roman characters – as an axis of action between the Eco-School and the Healthy Campus projects within Polytechnic University of Beja, involving three groups of children from elementary schools in Beja.

METHODOLOGY

The experience hereby presented arises from the initiative of the teachers in the subjects of "Physical and Recreational Activities in Nature" and "Experimentation and

Playfulness in Childhood" of the Short-Cycle degrees in Sports, Active Leisure and Well-being and Childhood Care, at the School of Education (Polytechnic University of Beja), through the proposal of an outdoor activity to a group of 55 children from elementary schools in Beja (Escola Básica 2,3 Mário Beirão and Colégio São José, Beja).

The activity took place on the Polytechnic University of Beja campus, using outdoor spaces and some school facilities. The material used for the activities was available at the Polytechnic University (especially from the physical education area), as well as recycled materials and costumes provided by the students.

RESULTS

This outdoor activity was developed through the proposal of a big game set in the theme of Asterix and Oblix cartoon, which is why it was called "Adventures in the Gaul Village". Students who organized the activity dressed up as Roman and Gaul characters, allowing the children to immerse themselves in this fantasy atmosphere.

The activity was led by two 'Master' guides (Asterix and Obelix) assisted by their Gaul friends who live with them in the village, where students played a leading role during the activity. Thus, there were 'Gaul' students who develop a series of 'training challenges' carried out as a group. Other 'Roman' students tried to 'mess-up' the tasks of the different groups of children.

The aim was to provide a playful and educational experience, exploring not only the adventures of the famous Gaul characters, but also cultural, historical and geographical aspects present in the narratives, arousing children's interest and curiosity by evoking the magical and adventurous atmosphere of the famous Gaul village.

CONCLUSIONS

The outdoor activity described above allowed students to learn from their own experience on how to organize a big game for elementary school children in a University Campus, with physical activities in the natural environment and involving another's school projects as main lines of action.

They were able to a) understand different organizational times and associated actions, b) develop soft skills when accepting all the different roles needed to make it

work and c) comprehend the need to establish good communication, while taking the responsibility to solve problems and work as a team.

Undoubtedly, the greatest learning is due to the direct interaction with the children, which allowed students to realize the importance of teacher's attitude, children's motivation, the benefit of incorporating a common thread to an activity and, above all, the importance of a distanced reflection on all these aspects, for the development of a well sustained pedagogical and technical work. Nevertheless, teamwork and the assumption of responsibility by students have been the most difficult challenges for teachers.

KEYWORDS: Physical Activity, Pedagogical Models, Adventure Pedagogy, Positive Development

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ASSOCIATION BETWEEN PHYSICAL ACTIVITY INTENSITY AND LEARNING APPROACHES IN ADOLESCENTS

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INTRODUCTION

In recent years, there has been a shift in the lifestyles of various age-groups, especially children in their late childhood. Unlike a few decades ago, children today are leading increasingly sedentary lifestyles that involve time spent on computers and watching TV. This lifestyle leads them to neglect the positive relationship between physical activity, fitness, cognitive function, and academic achievement (Donnelly et al., 2016; Marques et al., 2018; Martin et al., 2018; Pindus et al., 2019; Chaddock et al., 2011) that has been typical to this developmental stage (Graf, 2016; Graf et al., 2003). A conception of learning is a coherent system of knowledge and beliefs about learning and related phenomena (e.g., knowledge and beliefs about oneself as a learner, learning objectives, learning activities and strategies, learning tasks, learning and studying in general, and about the task division between students, teachers, and fellow students in learning processes). Learning orientations refer to the whole domain of students' personal goals, intentions, motives, expectations, attitudes, concerns, and doubts with regard to their studies (Vermunt & Vermetten, 2004). Implicit in this concern is the recognition that an important goal of education is helping students develop effective methods for adapting and regulating their thinking processes to handle the overwhelming flow of information in the environment (Mckeachie et al., 2010). Learning strategies are defined as "processes (or sequences of processes) that, when matched to the requirements of tasks, facilitate performance. Learning strategies have been

repeatedly demonstrated to be positively correlated with academic performance. They structure the processing of information by facilitating particular activities, such as the planning of learning tasks, goal setting, monitoring the progress toward these goals, adjusting if needed, and evaluating the learning process and the outcomes. This learning strategies can be divided into three categories: cognitive, metacognitive and management strategies (Donker et al., 2014; Mckeachie et al., 2010). Therefore, it is in society's best interest that learning should be optimized for all children. The aim of this study was to analyse the association between the intensity of physical activity (PA) and learning approaches in students aged 10 to 16 years. Secondarily, possible associations with the number of steps taken per day were also investigated.

METHODOLOGY

This cross-sectional study. A total of 61 (33 boys and 28 girls) participants aged 10 to 16 (15, 64 +- 2,295) with and BMI (body mass index) of 20.13 +- 2,64 kg/m2 in boys and 20 +- 2.31 kg/m2 in girls from one public school in Beja, Portugal were involved in this study. The intEFsity study was approved by the Ethics Committee of the University of Jaén - Spain (NOV.22/2. PRY). Before starting the data collection, the report on the research to be carried out was personally given to the school directors. Subsequently, the legal guardians of the minors were asked for their consent to participate. The name of each participant was coded to ensure anonymity and confidentiality.

Data collection began in the last week of January and ended in the first weeks of February 2024. It was carried out during school hours and was mainly divided into two phases. In the first, the heart rate and the number of daily steps of a full week were measured through the "Xiaomi Mi Band 4" bracelets. Each wristband was pre-configured with the data of the participant it corresponded to, including height, weight and age and maximum heart rate. Students had to carry out their daily routine, without modifications, always using the device. In the same day, we asked the subjects to answer one of the surveys. On the ninth day, the bracelets were collected and the data of a full week of each one were exported. In the second stage, we gave another questionnaire, with the learning approaches, whereas the weekly physical activity was evaluated, and sociodemographic data were collected.

PA levels were assessed using a Xiaomi Mi Band 4 that included the daily steps, light physical activity (Light PA), moderate physical activity (Moderate PA), Vigorous Physical Activity (Vigorous PA): moderate to vigorous Physical Activity (Moderate-Vigorous PA). Learning approaches were measured using the Revised Study Process Questionnaire, Two Factor (R-SPQ-2F), which assesses: Deep Approach, Surface Approach, Deep Motive, Surface Motive, Deep Strategy and Surface Strategy.

The analyses were carried out with the SPSS statistical package (v. 29.0 for MAC, Chicago). The results are shown as mean and standard deviation, as well as in percentages. The comparison by sex of the biometric characteristics and the continuous sociodemographic variables was carried out using the Student T test for independent samples and for the sociodemographic categorical variables the Chi-Square test was performed. *Pearson* correlation coefficients were calculated to explore the relationships between various learning approaches and different levels of PA.

RESULTS

Pearson correlation coefficients were used to explore the relationships between various learning approaches and different levels of PA. The results are summarized in Table 1.

Table 1

Correlations Between Learning Approaches and Physical Activity

Learning Approaches	Weekly Steps	*p*	Light PA	*p*	Mod. PA	*p*	Vig.PA	*p*	Mod. to Vig PA	*p*
Deep Approach	0,143	0,294	0,219	0,109	0,029	0,837	0,121	0,383	0,020	0,888
Surface Approach	0,219	0,106	0,069	0,616	-0,072	0,605	0,250	0,068	-0,087	0,541
Deep Motive	0,193	0,155	0,212	0,119	0,047	0,735	0,157	0,257	0,043	0,764
Deep Strategy	0,018	0,894	0,244	0,072	-0,006	0,964	0,106	0,447	-0,017	0,903
Surface Motive	0,202	0,135	-0,014	0,917	-0,101	0,466	0,164	0,236	-0,114	0,420
Surface Strategy	0,210	0,121	0,146	0,286	-0,033	0,813	,308*	0,023	-0,048	0,737

Note. PA, physical activity; Mod., moderate, Vig., vigorous.

The analysis revealed no significant correlation between the Deep Approach and Weekly Steps (r = 0.143, *p* = 0.294), indicating that the extent of a deep learning

approach is not associated with the number of steps taken weekly. In contrast, a significant positive correlation was found between Surface Approach and Vigorous PA (r = 0.250, p = 0.068), suggesting that students who adopt a surface learning approach may engage in higher levels of vigorous PA. Similarly, a marginally significant correlation was found between Surface Strategy and Vigorous PA (r = 0.308, p = 0.023), further supporting the notion that certain surface learning strategies are linked to increased vigorous PA. For the other learning approaches, such as Deep Motive and Deep Strategy, correlations with PA levels did not reach statistical significance. Overall, the correlation analysis suggests that while there are some significant relationships between specific learning approaches and levels of PA, these correlations are generally weak.

CONCLUSIONS

The results indicate that while PA, particularly moderate to vigorous PA, is positively correlated with deeper learning approaches, these associations were not always statistically significant across all dimensions of learning approaches. Specifically, active students showed tendencies towards adopting deeper learning strategies compared to their non-active counterparts. The results highlight the complex and multifaceted nature of the relationship between PA and learning behaviors, suggesting that while there is a trend towards a positive influence of PA on deeper learning approaches, further research with larger and more diverse samples is needed to fully understand these dynamics.

KEYWORDS: Student Well-Being, Education, Cognitive Function, Revised Two-Factor Study Process Questionnaire (R-SPQ-2F).

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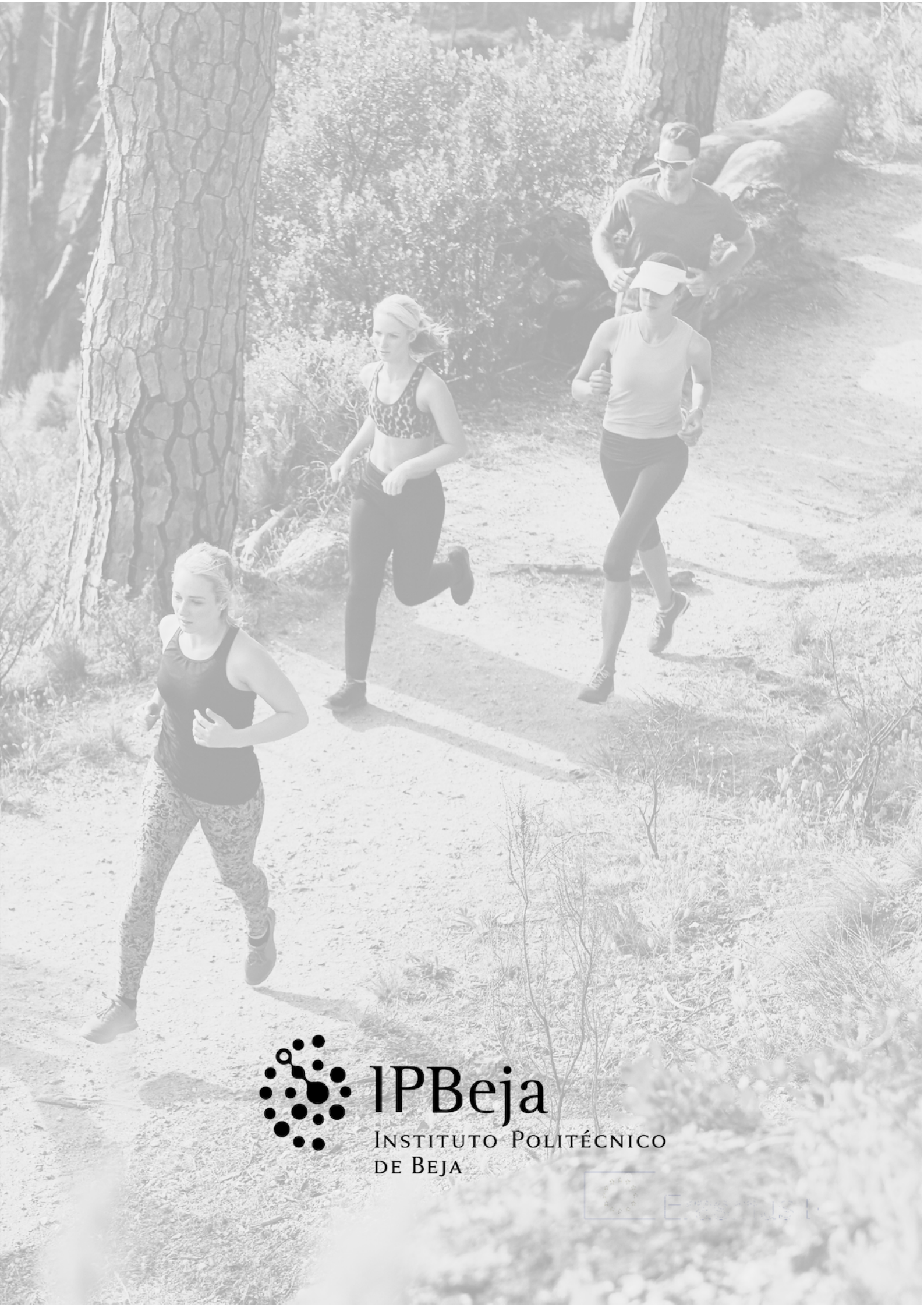

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