
SURFING ON PHYSICAL EDUCATION CURRICULUM AND THE IMPACT ON STUDENT'S WELL-BEING

A PRÁTICA DE SURFE NO CURRÍCULO DE EDUCAÇÃO FÍSICA E OS IMPACTOS NA QUALIDADE DE VIDA DOS ESTUDANTES

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RESUMO

As aulas de Educação Física representam uma oportunidade única de desenvolver competências motoras, habilidades esportivas e promover uma vida saudável. A prática esportiva no meio aquático, fornecem um local alternativo de alta qualidade para experiências educacionais ao ar livre. O surfe é um desporto aquático praticado ao ar livre, que se realiza em ambiente natural, revelando-se como uma importante forma de aprendizagem e terapia. O objetivo desta pesquisa foi analisar quantitativa e qualitativamente a importância do surfe nas aulas de Educação Física (EF) como suporte ao bem-estar de crianças e adolescentes. Um total de 190 alunos (80 meninas) participaram deste estudo e foram inicialmente avaliados antes e após 6 semanas de prática de surfe, como parte de um currículo de EF, quanto aos impactos no bem-estar e na socialização. Analisando os dois momentos, as questões mais valorizadas foram Q5 ($4,39 \pm 0,827$; $4,52 \pm 0,791$) e Q14 ($4,60 \pm 0,716$; $4,47 \pm 0,808$). A análise fatorial exploratória resultou em 3 categorias (Expectativas Individuais; Autoconfiança; Socialização no Surfe), que explicam 62,79% da variância total. O fator Expectativa Individual foi o mais significativo e a Autoconfiança teve o aumento mais significativo. O surfe no currículo de EF pode ser considerado uma atividade segura, um importante mediador para fazer novos amigos e fazer parte de um grupo, com importantes efeitos de curto prazo na autoconfiança, principalmente em adolescentes.

Palavras-chave: Blue exercise. Surf. Esportes ao ar livre. Green exercise.

ABSTRACT

Physical Education classes represent a unique opportunity to develop motor competence, sports skills and foster healthy life. Blue spaces environments provide an alternative location for high-quality outdoor educational experiences. Throughout, surfing is an aquatic outdoor sport, that takes place in the natural setting, proved as an important learning and therapeutic approach. The aim of this research was to analyze the importance of surfing in Physical Education (PE) classes as a support of children and adolescent's well-being. A total of 190 students (80 girls) participated in this study and were assessed at baseline and after 6 weeks of surfing practice as part of a PE curriculum, regarding the impacts on well-being and socialization. Analyzing the two moments, the most valued questions were Q5 (4.39 ± 0.827 ; 4.52 ± 0.791) and Q14 (4.60 ± 0.716 ; 4.47 ± 0.808). The exploratory factor analysis results in 3 categories (Individual Expectations; Self-Confidence; Socialization in Surfing), which explain 62.79% of the total variance. The factor Individual Expectation was the most significant and Self-Confidence had the most significant increase. Surfing as part of the PE curriculum can be considered a safe activity, an important mediator for making new friends and being part of a group with important short-term effects on self-confidence, especially in adolescents.

Keywords: Blue exercise. Surf. Outdoor sports. Green exercise.

Introduction

The human body has developed to be physically active and physical activity is a healthy life habit¹. Moreover, physical activity promotion and physical literacy provide the formation of healthy habits and an opportunity in the definition of educational and health promotion strategies².

The fundamental objectives of Physical Education (PE) classes is to promote the development of motor competence, sports skills and to further adopt healthy lifestyle habits

in the student community³. Healthy lifestyle habits are related to a daily behaviors (e.g. physical activity and eating habits) and habits of living that allow physical, mental, and social wellbeing, connected to more than half of the individual health and quality of life⁴

Despite the physical, psychological, social and cognitive benefits of adopting a healthy lifestyle through PE classes⁵, most children and adolescents do not meet the recommendations of physical activity (PA) and other health-related behaviors⁶. Regarding children, well-being through PA is associated with play, particularly play in nature⁷, with PE classes being a unique opportunity in advocating the benefits of PA.

Physical inactivity has become a worldwide problem⁸, which becomes already evident in childhood⁹. Physical inactivity problem does not begin at the school, however, school PE is the public program responsible for training and promoting a physically active life style in children and younger adults¹⁰.

Outdoor sports were shown to be used as a tool to successfully interact in breaking sedentary behavior in non-active people, promoting active and healthy lifestyles, and influencing positive attitudes towards PA¹¹. Furthermore, PA in an outdoor natural environment may bring additional positive effects regarding measures of mental well-being that are not seen when participating in similar physical activity indoors¹². PA in an outdoor natural environment can be classified as “green exercise”. Green exercise is defined as embracing PA and/or planned and structured exercise, while being directly exposed to nature, such as parks and forests (“green environments”). Even though, also the rivers and the ocean are part of the green exercise setting, defined as “blue spaces”¹³. Blue spaces environments provide an alternative location for high-quality outdoor educational experiences^{14,15}

Surfing is an aquatic outdoor sport, that takes place in the natural setting, requiring the riding of a moving wave¹⁶. Furthermore, surfing has been established as a valuable therapeutic approach in i) manage the well-being of combat veterans^{17,18}; ii) improving social skills in children and adolescents with Autism^{19,20} iii) creating a stimulating learning environment for children with disabilities^{21,22} and iv) promoting personal well-being and social integration in vulnerable children and adolescents^{14,23–25}.

Considering the advantages of surfing and that PE teachers have an obligation to transmit and create healthy and active lifestyles in their students, explore new means and strategies to provide physical activity outside the limits of PE³, this research aimed to explore the importance of surfing as a unique PE learning environment for children and adolescents.

Methods

Sample

A total of 190 students, 108 boys (11,16±1.55 years) 80 girls (11.05±1.63 years) participated in this study. Two of the participants preferred not to report the gender, seventeen drop out and eighteen were not present in the last evaluation. The majority reported to practice sports outside the school (sports practice, n=92), with soccer (27.8%) and swimming (8.3%) being the most predominant for boys and dancing (17.5%) and swimming (13.8%) for girls.

As indicated in previous researches¹⁵, all students participated in the activities independent of the sociocultural provenience, ethnicity and disability. However, the “Challenge by Choice” principle was applied at all time. The children identified with specific needs (e.g.: autism; motor disability) had an extra teacher, specialized in the area of intervention, that caters assistance in the water for the accomplishment of the adapted learning objectives.

Procedures

Surfing in the PE Curriculum is an innovative project, part of the Viana do Castelo “School Nautical Activities”. The “School Nautical Activities” program intends to bring nautical activities to the educational establishments. Once a week, the Viana do Castelo sports division, along with the participant physical education schoolteachers and four city clubs, implement surfing, canoeing, rowing and sailing lessons as part of the PE learning activities. All activities occur in the nautical centers of rowing, canoeing, sailing and surfing and are designed for children in school age from elementary school (5th/6th grade), middle school (7th–8th grades) and high school (9th–12th grades).

During the activities, PE teachers are assisted by specialized instructors in the specific nautical activity, who plan and implement the programs in accordance with the development of basic and intermediate specific sport skills. The activities are enrolled during a 6 week mesocycle with a duration of at least forty-five minutes of useful time per session (excluding travel time and getting ready to start the practice).

Surfing in the PE Curriculum is developed on the Surfing Viana High Performance Center (surf center participating in the project). During the first class, all participant students were assessed according to a specific PA battery, that work as a diagnostic tool in the planning of the surfing intervention. During this evaluation, all participants were invited to fulfil a set of items arranged in a matrix of 14 variables, divided into Expectations, Self-Confidence and Socialization in Surfing, with an additional question where was asked to write three words that associate with beach and surfing and demographic information. The questionnaire was applied using a paper survey administered in the waiting period, at the end of the physical evaluation (pre surfing intervention). All responses were confidential and took between 3 to 4 minutes to complete. After the six weeks, the same questionnaire was applied with the same structure but with one more question (post surfing intervention).

All ethical standards were warranted as suggested by the Declaration of Helsinki and the Institutional Review Board gave their ethical clearance (CTC-ESDL-CE001-2020)

Instruments

The questionnaire was founded on the English version of the International Surf Therapy Organization research survey²⁶, compiling a quantitative and qualitative assessment. The first part of the questionnaire is the Warwick-Edinburgh Mental Wellbeing Scale, with strong psychometric consistency, showing high internal consistency and construct validity^{27,28}. The second part is based on a qualitative analysis of the subject opinion.

To achieve the study requirements a board of specialists with experience in outdoor sports were involved in the translation of the qualitative questions of the questionnaire. This panel of specialist involve researchers and surfing experts and instructors from Surfing Viana High Performance Center. All the specialists were involved in a previous project (BOSS) regarding the Benefits of Outdoor Sports (<https://outdoorsportsbenefits.eu/>). The questionnaire was reviewed and objectively adjusted until the panel agreed on the translation and the questions to meet the main purposes of the original requests.

The first part, Warwick-Edinburgh Mental Wellbeing Scale^{27,28}, was divided into Expectations, Self-Confidence and Socialization in Surfing. Q1: “I’ve been feeling optimistic about the future”; Q2: “I’ve been feeling useful”; Q3: “I’ve been feeling relaxed”; Q4: “I’ve been feeling interested in other people”; Q5: “I’ve had energy to spare”; Q6: “I’ve been dealing with problems well”; Q7: “I’ve been thinking clearly”; Q8: “I’ve been feeling good about myself”; Q9: “I’ve been feeling close to other people”; Q10: “I’ve been feeling confident”; Q11: “I’ve been able to make up my own mind about things”; Q12: “I’ve been feeling loved”; Q13: “I’ve been interested in new things”; Q14: “I’ve been feeling cheerful”. All these items were rated in accordance with a five-points Likert scale in between “none of

the time” and “all of the time”. In a second part, it was asked to write three words that are associated with the beach and surfing. An additional third question, only presented in the post intervention questionnaire, was answered by the participants with “yes” or “no” to the statements: “I feel safe”; “I had fun”; “I made new friends”; “I feel part of a group”; “I feel like an important part of a team or a group”.

Statistical Analyses

Descriptive statistics were calculated and analysed under the assumption of normality and homoscedasticity of the different variables.

An exploratory factor analysis (EFA) was chosen as the best statistical method to reduce the numerous variables from the questionnaire and create new variables that underlie the previous ones²⁹. Following the EFA analysis, the 14 variables from the survey were tested and a reliability analysis was carried out by internal consistency with the Cronbach’s alpha. The results were subjected to the following criteria: Poor (< 0.60); Moderate (0.6 to <0.7), Good (0.7 to < 0.8), Very Good (0.8 to < 0.9); Excellent (0.9 to 1.0)³⁰.

After the EFA was undertaken and the factors created, the paired sample T-test was used to test pre and post intervention.

The independent sample *t*-test was used between genders and sports practice, with a one-way ANOVA used to test the variance of answers between age groups. All statistical analyses were completed using SPSS version 25.0.0.0 for Windows (IBM, USA) for $p < 0.05$.

The analysis of the qualitative part of the questionnaire was accomplished using NVivo version 12.0 for Mac (QSR International, Melbourne, Australia).

Results

Analyzing the two moments (pre and post intervention), the answer presenting the highest values were Q5 (4.39 ± 0.827 ; 4.52 ± 0.791) and Q14 (4.60 ± 0.716 ; 4.47 ± 0.808). On the other hand, the least valorized questions were Q2 (3.81 ± 0.890 ; 3.85 ± 0.981) and Q6 (3.83 ± 0.899 ; 3.96 ± 0.925).

According to the EFA, the 14 variables from the survey result in 3 categories, which explain 62.79% of the total variance by the initial data (Table 1).

Table 1 - Factorial matrix of the variance

Factors	Variables	Loading	α	Eigen value	% Variance
<i>F1 – Individual Expectations</i>	Q2	0.536	0.805	5.04	42.05
	Q3	0.698			
	Q8	0.836			
	Q10	0.697			
	Q14	0.585			
<i>F2 – Self-Confidence</i>	Q4	0.852	0.796	1.45	12.10
	Q9	0.741			
	Q12	0.533			
	Q13	0.679			
<i>F3 – Socialization in Surfing</i>	Q1	0.749	0.648	1.03	8.63
	Q7	0.654			
	Q11	0.636			

Note: α - alfa; % - percentage; F1 – Factor one; F2 – Factor two; F3 - Factor three

Source: authors

The alpha coefficient (Cronbach's alpha) in the different categories resulted in the following values: F1 = 0.805 (high); F2 = 0.796 (high); F3 = 0.648 (moderate). The first factor (F1), Individual Expectations, explains 42.05% of the variance (5 items from the survey); the second factor (F2), Self-Confidence, explains 12.10% (4 items from the survey) and the third factor (F3), Socialization in Surfing, explains 8.63% of the variance (3 items from the survey).

After applying the paired sample t-test between the 3 factors, the results didn't reveal statistically significant differences between the pre and post intervention in the different factors (Table 2). However, the results of the two moments in the three factors are considered high with respect to the Likert scale (all above of 4 on a scale of 1 to 5).

Table 2 - Paired Sample T-test results between questionnaire factors.

Factors		Mean±SD	t	p-value	Lower bound	Upper bound
					95% confidence interval	
Individual Expectations	Pre	4,04±0.74	0.20	0.831	-0.12	0.14
	Post	4,03±0.73				
Self-Confidence	Pre	4,02±0.66	-1.54	0.123	-0.25	0.03
	Post	4,13±0.76				
Socialization in Surfing	Pre	4,20±0.75	-0.47	0.633	-0.09	0.14
	Post	4,18±0.64				

Note: SD – Standard deviation; % - percentage

Source: authors

It is also remarkable that the factor “Self-Confidence” has an increase between the pre and post intervention (4.02±0.66 to 4.13±0.76).

Regarding the differences between genders and sports practice, Table 3, there are no statistically significant differences between the different factors during the two moments (pre and post intervention).

Table 3 - Descriptive statistics (average and standard deviation) regarding gender and sports practice

Factors	Variables	Pre Intervention	Post Intervention
<i>Individual Expectations</i>	Male	4.04±0.75	4.16±0.74
	Female	4.08±0.72	4.08±0.79
	Sport Practice_Yes	4.13±0.68	4.22±0.70
	Sport Practice_No	3.86±0.81	4.01±0.78
<i>Self Confidence</i>	Male	3.97±0.79	3.97±0.60
	Female	4.11±0.65	4.11±0.68
	Sport Practice_Yes	4.05±0.71	4.22±0.59
	Sport Practice_No	4.03±0.68	4.10±0.64
<i>Socialization in Surfing</i>	Male	4.04±0.68	4.18±0.78
	Female	3.97±0.63	4.24±0.72
	Sport Practice_Yes	4.03±0.63	4.26±0.74
	Sport Practice_No	3.97±0.68	4.07±0.69

Source: authors

However, it is possible to observe that the participants who assume to practice sports had higher mean values when compared to the participants that don't practice sports regularly.

The one-way ANOVA tested the variance of answers between age groups (Table 4) in different moments (pre and post intervention).

Table 4 - Descriptive statistics (average and standard deviation) regarding age groups.

Factors	8-10 years old		11 years old		12 + years old	
	Pre	Post	Pre	Post	Pre	Post
<i>Self - Confidence</i>	4.22±0.66 ^a	4.14±0.65	3.96±0.69	3.97±0.72	3.76±0.95 ^a	3.85±0.96
<i>Individual Expectations</i>	4.28±0.60	4.34±0.66	4.14±0.61	4.15±0.72	3.99±0.75	3.96±1.01
<i>Socialization in Surfing</i>	4.07±0.64	4.25±0.75	3.95±0.66	4.04±0.74	4.02±0.84	4.02±0.84

Note: ^a Significantly differences $p = 0.022$; Pre – pre intervention; Post – post intervention

Source: authors

In this case, significant differences were found between age groups for Self-Confident in pre-test ($p = 0.007$; $n^2 = 0.054$). No significant differences between groups were found for Individual Expectations ($p=0.155$; $n^2 = 0.025$) and Socialization in Surfing ($p=0.57$; $n^2 = 0.007$) in the pre intervention, as well as in all factors during the post intervention.

Moreover, to interpret the second part, the qualitative analysis was performed considering the three main words that the students identified when they thought about the beach and surfing. Results revealed that there are some words in common between the pre and post intervention. Thus, it can be found that “Sea” (17.55%; 17.23%), “Board” (15.36%; 15.38%), “Sand” (13.17%; 15.38%) and “Waves” (12.23%; 12.00%) are the most referred words at pre and post intervention. These words varied in terms of percentage, e.g. after being

chosen the 15 more frequent words, with at least 3 character length. It was possible to verify that the percentage increase during the post intervention, justified by the increase of the same words chosen by the participants.

The previous results of this analysis can be also observed in the keywords that are displayed in Figure 1a and 1b.

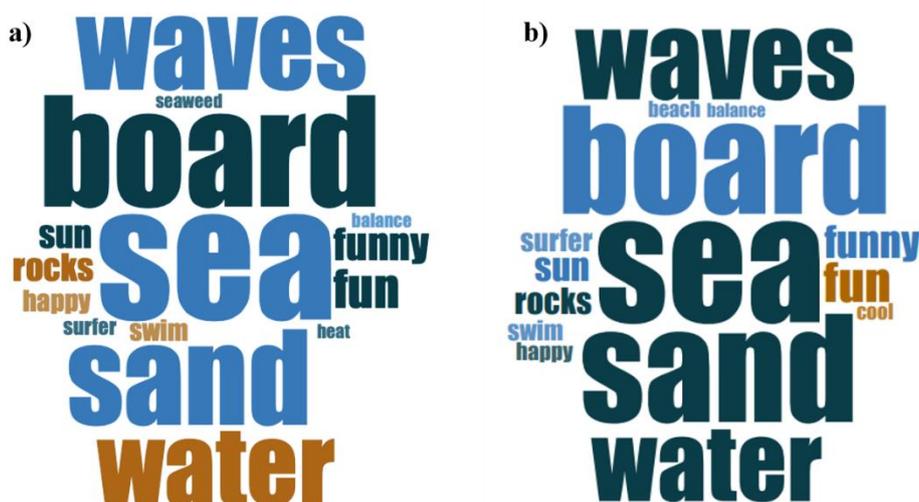


Figure 1 – Fifteen most frequent keywords - a) pre intervention; b) post intervention.

Observing the frequencies in the third part, just in post intervention (Table 5), more than half of the participants made new friends and more than 90% report feeling safe, having fun and being part of a group during surfing.

Table 5 – Frequencies regarding question number three.

Variables	Total		Boys		Girls	
	YES	NO	YES	NO	YES	NO
<i>"I feel safe"</i>	95,04%	4,96%	97,59%	2,41%	91,38%	8,62%
<i>"I had fun";</i>	97,16%	2,84%	98,81%	1,19%	94,74%	5,26%
<i>"I made new friends";</i>	51,41%	48,59%	54,76%	45,24%	46,55%	53,45%
<i>"I feel part of a group";</i>	92,96%	7,04%	92,86%	7,14%	93,10%	6,90%
<i>"I feel like an important part of a team or a group"</i>	83,80%	16,20%	84,52%	15,48%	82,76%	17,24%

Source: authors

Discussion

This study aims to investigate the importance of surfing as a unique PE learning environment for children, considering that the existing evidence for surfing interventions mainly focus on children and adolescents in specific social, or health issues³¹. The inclusion of surfing in PE classes can be categorised mainly in 3 factors: Individual Expectations; Self-Confidence and Socialization in Surfing, with Individual Expectations being the most important factor, explaining 42.05% of the total variance.

Individual Expectations are directed linked to beliefs about what will happen in the future and focus on the occurrence or non-occurrence of a specific event or experience³², strengthening the importance of blue spaces PA psychosocial well-being. Analyzing the two moments (pre and post intervention), the questions which revealed the highest score, rely exactly on these factors that underlie mental health and psycho-social well-being outcomes which are the most common health outcomes assessed in blue spaces PA practice³¹. However, the results didn't reveal statistically significant differences between the pre and post intervention between the different factors. This fact can be possible mediated by the high values at baseline, considering that they are above 4 on a Likert scale in 1 to 5.

Although, the factor "Self-Confidence", even without a significant difference, demonstrates an increase. This is an important indication for the positive outcomes of surfing, since there were only six weeks of exposure and incorporates self-esteem, self-efficacy and social confidence, the most considered well-being indicators in these types of outdoor interventions^{11,13,31}.

Considering gender and sports practice ("yes" or "no"), there were no statistically significant differences between the factors during the two moments (pre and post intervention), but with the same increase indication when aggregated by sport practice for Self-Confidence and Socialization in Surfing, for gender and sport practice. The development of communication skills, cooperation and social interaction, enhanced relationships, social trust and better overall group cohesion, are related to the practice of outdoor sports¹¹. In this perspective, the increase in Socialization in Surfing was probably related to the fact that students were in a more informal setting than the school facility, travel together by bus and were exposed to a new sport, in an outdoor aquatic situation. Also being with the same colleges from the same school or class as normal, but in an unusual situation, can lead to more interactions. Important changes can be found for the participants who reported not to practice sports. They increased their mean values in the first part from values around 3 in the Likert scale to mean values around 4, indicating improvement in self-esteem, self-efficacy and social confidence.

Taking into consideration the different age groups, at baseline, it was identified a significant difference for Self-Confidence between the first (8-10 years old) and the third group (12+ years old). These differences were not maintained during time (post intervention) and possibly mediated by the fact that exercise has positive short-term effects on self-confidence³³.

The qualitative analysis demonstrated a strong connection with the surrounding environment and the specific equipment required for surfing, with the very large majority (more than 90%) feeling safe, having fun and being part of a group. Another positive impact was the fact that almost half of the participants made new friends and more than 80% felt as an important part of a team or a group. These observations reinforce previous findings regarding the impact of practicing outdoor sports in communication skills, cooperation and social interaction, enhanced relationships, social trust and better overall group cohesion¹¹.

Besides the limitation concerning sample size, the distribution between the groups and the absence of a control group makes it impossible to generalise the results. Nevertheless, the lack of research considering the benefits of PA for children and adolescents in green spaces¹³, the unique characteristics of the observed project and the mixed qualitative and quantitative analyses, make these findings especially relevant. This study was exploratory, and since this was the first attempt to investigate surfing as a unique PE learning environment for children and adolescents, represents, at the same time a strength and a limitation, because of the impossibility to compare the results with other similar methodology's.

Conclusion

The benefits of including surfing in PE classes can be categorised mainly in Individual Expectations; Self-Confidence and Socialization, with Individual Expectations being the most important factor.

The qualitative analyses clearly demonstrate the positive effects of surfing as part of the PE curriculum in being a safe activity and an important mediator for making new friends and being part of a group.

Six weeks of surfing as part of the PE curriculum have positive short-term effects on self-confidence, especially in adolescents.

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