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The impact of the pandemic on sports practice: a school-based study

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Abstract

Introduction and Objectives: Sports practice (SP) encourages physical, cognitive, and behavioral growth in children and adolescents. The COVID-19 pandemic significantly disrupted SP among children and adolescents, leading to increased screen time and sedentary behavior. We aimed to evaluate the variables that affected SP during lockdown and after its conclusion. **Methods:** In a cross-sectional survey conducted between April and June 2022 in multiple schools in the districts of Porto, Vila-Real, and Viseu, an SP evaluation questionnaire was given to parents and students enrolled in basic education. **Results:** 330 children and adolescents aged six to 15 took part, with similar numbers of males and females, of whom 28 had comorbid conditions. A third of their parents practiced sports. 186 (56%) of the participants were engaging in physical activity outside of school, with competition accounting for 43% of that. The SP of the participants was influenced by the parents' SP (father: $p = 0.01$; mother: $p = 0.01$) and the parents' educational level (father: $p = 0.01$; mother: $p = 0.01$). During the lockdown period, 91% of students suspended SP, of whom 23% did not resume said activity. Parental SP (parent $p = 0.03$; mother $p = 0.02$) and competitive SP ($p = 0.05$) accounted for a quicker return to sports activity. Competitive SP ($p < 0.01$) was the factor that had the most immediate impact on an early return to sport. **Discussion:** Sport is crucial for fostering children's and adolescents' relationships, which have been hampered by the COVID-19 pandemic. To encourage children and young people to participate in SP and move toward healthy living from a physical, mental, and social perspective, it is crucial to emphasize parents' role in forming new habits in children and adolescents.

Keywords: Sports. School health services. COVID-19.

O impacto da pandemia na prática desportiva: um estudo de base escolar

Resumo

Introdução e Objetivos: A prática desportiva (PD) promove o desenvolvimento físico e cognitivo-comportamental das crianças e adolescentes. A pandemia da COVID-19 levou a uma diminuição significativa da participação desportiva entre crianças e adolescentes, levando ao aumento do tempo de ecrã e ao comportamento sedentário. Pretendemos avaliar as variáveis que afetam a PD e a sua retoma após um período de inatividade. **Métodos:** Num inquérito transversal realizado entre abril e junho de 2022 em diversas escolas dos distritos do Porto, Vila-Real e Viseu, foi aplicado um questionário de avaliação de SP aos pais e alunos do ensino básico. **Resultados:** Participaram 330 crianças e adolescentes dos 6 aos 15 anos, com distribuição semelhante entre os sexos, dos quais 28 apresentavam comorbidades. Um terço dos pais praticava desporto.

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186 (56%) dos participantes praticavam atividade física fora da escola, sendo a competição responsável por 43% disso. A PD dos participantes foi influenciada pela PD dos pais (pai: p = 0,01; mãe: p = 0,01) e pela escolaridade dos pais (pai: p = 0,01; mãe: p = 0,01). Durante o período de confinamento, 91% dos estudantes suspenderam a PD, 23% dos quais não retomaram. Um retorno mais rápido à PD foi explicado pela PD parental (pai: p = 0,03; mãe: p = 0,02) e PD competitiva (p = 0,05). A PD competitiva (p < 0,01) foi o fator que teve impacto mais imediato no regresso precoce ao desporto. **Discussão:** A PD é fundamental para fomentar o relacionamento entre crianças e adolescentes e foi prejudicada pela pandemia da COVID-19. Para incentivar crianças e jovens à PD, e avançarem em direção a uma vida saudável do ponto de vista físico, mental e social, é fundamental compreender e incentivar os pais no seu papel de formação e promoção de novos hábitos nas crianças e adolescentes.

Palavras-chave: Desporto. Saúde escolar. COVID 19.

Keypoints

What is known
- Sports practice is important for child development.
- There has been a drastic drop-in sports practice in recent years, in pediatric age.

What is added
- Parents' sports practice is a predictor of their children's sports practice.
- Children who play competitive sports are more likely to resume some kind of sports practice after a period of lockdown.

Introduction

In today's society, marked by technology and industrialization, daily activities require less and less physical effort[1]. Children, often following the example of adults, are also increasingly sedentary. To combat a sedentary lifestyle and promote healthier lifestyle habits, in Portugal, Physical Education is part of the Basic Education curriculum, a discipline that promotes sports practice (SP) to encourage the development of fundamental psychomotor skills, required by the different stages of motor, cognitive, social and affective development[2].

It is in basic education that these abilities are put to the test, and it is also at this age that children begin to develop the habits that will shape their future lifestyle. For a healthy lifestyle, several factors of everyday life need to be in balance. SP, healthy eating and living together in groups are important, but the attraction to screens and fast food often distances children from this goal. There is a vast amount of literature showing that the progressive increase in screen time and the sedentary lifestyle, associated with the current pandemic situation and the consequent lockdowns, led to a drastic drop in SP in children in 2020-2021[3,4].

Thus, in this phase of the aftermath of the pandemic, it is important to recover pre-pandemic levels of SP in order to then focus on the objective of achieving, and eventually surpassing, the targets proposed by the WHO for the practice of physical exercise by 2030[5].

Taking this information into account, the main objectives of this study were to evaluate the factors that influenced SP in children and adolescents of basic education and the factors that lead to the return to sports after a period of inactivity (lockdowns implemented by the government as an almost mandatory period of inactivity) among children and adolescents with regular SP out of school. The factors that contributed to an earlier return to SP were then also evaluated.

Methods

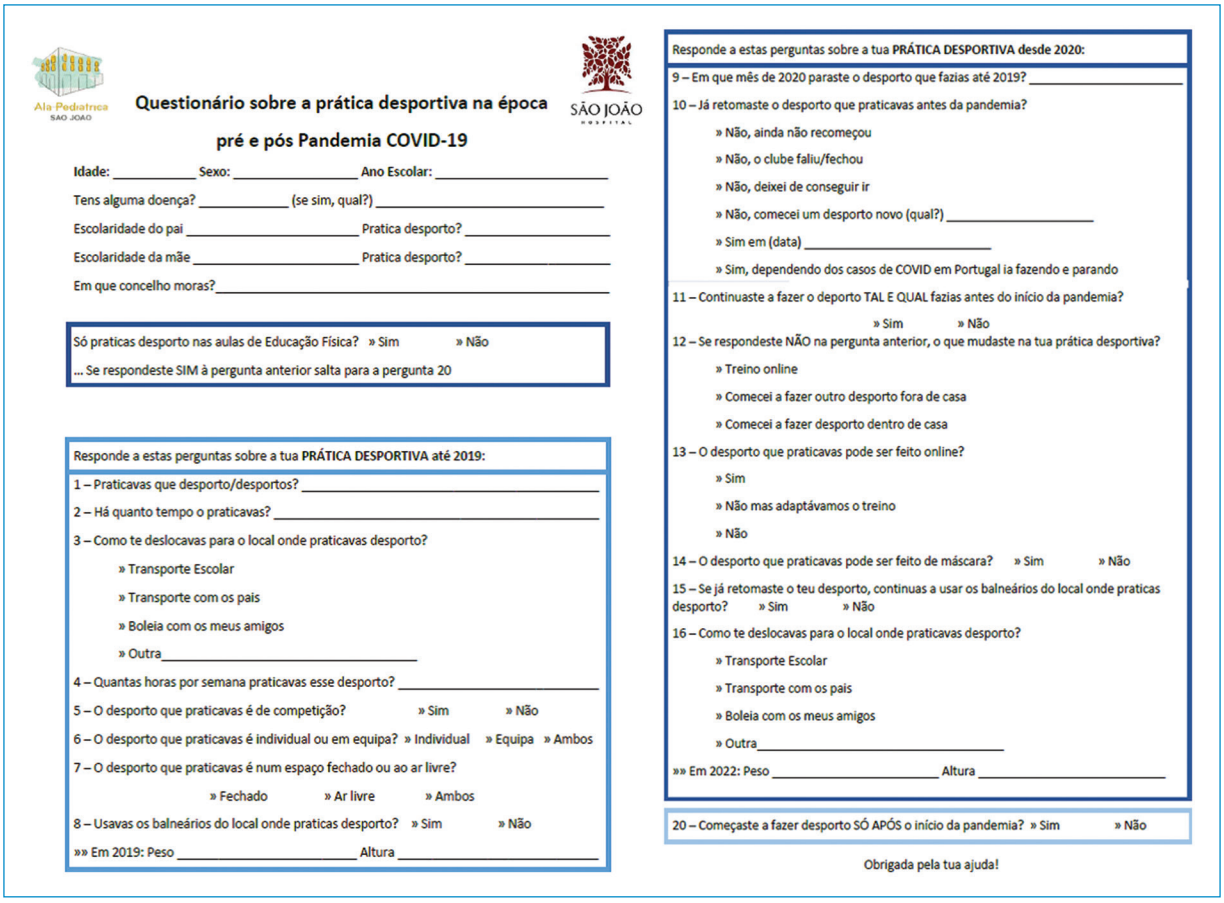
Type of study and participants

School-based cross-sectional study in which guardians and students from primary schools in the districts of Viseu and Porto were interviewed, after approval by their educational council. Information was collected between April and June 2022.

Assessment of physical activity

A questionnaire was developed based on pre-existing questionnaires for the qualitative assessment of physical activity[6], which could be answered in person and online (via Google Form©).

The questionnaire (Fig. 1) was divided into 2 parts: SP assessment until 2019 (the year prior to the start of the COVID-19 pandemic) and SP assessment after the start of the pandemic. To begin with, clinical data (comorbidities, weight and height), demographic information (age, education, location) and SP details of the parents and children were evaluated. It was assessed



Questionário sobre a prática desportiva na época pré e pós Pandemia COVID-19

Idade: _____ Sexo: _____ Ano Escolar: _____

Tens alguma doença? _____ (se sim, qual?) _____

Escolaridade do pai _____ Pratica desporto? _____

Escolaridade da mãe _____ Pratica desporto? _____

Em que concelho moras? _____

Só praticas desporto nas aulas de Educação Física? » Sim » Não

... Se respondeste SIM à pergunta anterior salta para a pergunta 20

Responde a estas perguntas sobre a tua **PRÁTICA DESPORTIVA até 2019:**

1 – Praticavas que desporto/desportos? _____

2 – Há quanto tempo o praticavas? _____

3 – Como te deslocavas para o local onde praticavas desporto?

» Transporte Escolar

» Transporte com os pais

» Boleia com os meus amigos

» Outra _____

4 – Quantas horas por semana praticavas esse desporto? _____

5 – O desporto que praticavas é de competição? » Sim » Não

6 – O desporto que praticavas é individual ou em equipa? » Individual » Equipa » Ambos

7 – O desporto que praticavas é num espaço fechado ou ao ar livre?

» Fechado » Ar livre » Ambos

8 – Usavas os balneários do local onde praticas desporto? » Sim » Não

»» Em 2019: Peso _____ Altura _____

Responde a estas perguntas sobre a tua **PRÁTICA DESPORTIVA desde 2020:**

9 – Em que mês de 2020 paraste o desporto que fazias até 2019? _____

10 – Já retomaste o desporto que praticavas antes da pandemia?

» Não, ainda não recomeçou

» Não, o clube faliu/fechou

» Não, deixei de conseguir ir

» Não, comecei um desporto novo (qual?) _____

» Sim em (data) _____

» Sim, dependendo dos casos de COVID em Portugal ia fazendo e parando

11 – Continuaste a fazer o deporto TAL E QUAL fazias antes do início da pandemia?

» Sim » Não

12 – Se respondeste NÃO na pergunta anterior, o que mudaste na tua prática desportiva?

» Treino online

» Comecei a fazer outro desporto fora de casa

» Comecei a fazer desporto dentro de casa

13 – O desporto que praticavas pode ser feito online?

» Sim

» Não mas adaptávamos o treino

» Não

14 – O desporto que praticavas pode ser feito de máscara? » Sim » Não

15 – Se já retomaste o teu desporto, continuas a usar os balneários do local onde praticas desporto? » Sim » Não

16 – Como te deslocavas para o local onde praticavas desporto?

» Transporte Escolar

» Transporte com os pais

» Boleia com os meus amigos

» Outra _____

»» Em 2022: Peso _____ Altura _____

20 – Começaste a fazer desporto SÓ APÓS o início da pandemia? » Sim » Não

Obrigada pela tua ajuda!

Figure 1. Questionnaire applied in the study.

whether the children's SP was restricted to just physical education or whether they also practiced sports during extracurricular hours. Students who regularly practiced sports outside of school were asked about the sports practiced, the overall time of the SP as well as its weekly schedule, the mode of travel, the level of competition, whether the SP was in a team or individual, whether it was in an indoor or outdoor space, and about the use of changing rooms. In the second part of the questionnaire, the re-uptake of the sport was evaluated (and how that happened) and the adaptation measures necessary to maintain regular SP in a period of lockdown, namely the change of the place and/or the sport practiced. Students who only practiced school sports were asked if they started SP after the start of the pandemic.

The questionnaire was subsequently sent to the academic councils of various school groups in the districts of Porto, Viseu and Vila-Real. After approval by the academic council, the questionnaires were distributed by the educational community to be answered by guardians and children.

Statistical analysis

Means and standard deviations were used to describe continuous variables with normal distribution.

The clinical and demographic parameters already mentioned and their relationship with SP and subsequently the children's return to sports were evaluated. For this purpose, crosstab analysis was performed using Chi-Square and Fisher's Exact Test as statistical measures. A logistic regression was then performed to assess which variables determined the SP and sports recovery. A survival analysis was also carried out to ascertain the characteristics of SP that motivated an earlier return to sports. The SPSS Software version 27.0 statistical analysis was used, with a p-value of less than 0.05 considered to be statistically significant.

This study was evaluated by the Hospital's Ethics Committee and a consent form was not required.

Results

There were 330 responses to the questionnaire from students aged between six and 15 (mean age) 10.56 years (standard deviation 2.8 years) with similar numbers from each gender (164 females and 166 males). The average Body Mass Index (BMI) of children who practiced sports as an extracurricular activity was 18.45 (standard deviation 4.02), whereas the average BMI of children who only practiced sports in physical education was 18.90 (standard deviation 3.65). This difference was not found to be statistically significant ($p = 0.53$). Table 1 presents the basic characteristics of the sample of students. 28 children had at least one medical comorbidity (Table 2), with allergic pathology being the most frequently mentioned.

Table 1. Baseline characteristics of the sample

	n	%
Male	166	50.3
Comorbidities	28	8.5
Regular sports practice outside of school	187	56.7
Competitive sports	81	43.5
Sports practice time during the week		
< 2 hours	58	31.2
2-6 hours	103	55.4
> 6 hours	25	13.4
Time practicing sports		
< 1 year	29	15. 5
1-3 years	76	40.9
> 3 years	81	43.5
Indoor sports	107	57.5
Group sports		
Individual	39	21.0
Team	83	44.6
Both	40	21.5
Changing rooms	129	69.4
Parents' sports practice		
Father	113	34.5
Mother	110	33.1
Parents' educational status		
Father		
Elementary	114	35.4
High	100	31.1
University	108	33.5
Mother		
Elementary	56	17.2
High	99	30.5
University	170	52.3

Sports activity in the pre-pandemic season

187 children (56.7%) played sports regularly (the sports practiced are shown in Table 3) outside of school and the most-commonly mentioned sports were football and swimming. 43% practiced competitive sports and the majority practiced team sports, between two and six hours a week, for more than three years. 107 (57.5%) of the children practiced sports indoors. The factors that influenced the SP of these children were parental sports activity (father $p < 0.01$; mother $p < 0.01$), that is, if the parents practiced sports, the child was more likely to do so, and parental education (father $p < 0.01$; mother $p < 0.01$). In this case, the higher the parental academic degree, the more likely it is that their children practice sports.

Table 2. Children's comorbidities reported by parents

Diabetes	Pulmonary pathology	Spina bifida
Allergic pathology	Epilepsy	Cardiac arrhythmia
Celiac disease	Attention deficit hyperactivity disorder	Immunoglobulin deficiency
Lactose intolerance	Autism spectrum disorder	Migraine

Sports activity during the pandemic

160 (91.7%) children suspended SP during the lockdown period, 41 (22.5%) of whom did not resume it. The rest found themselves unable to continue practicing their usual sport even through remote means, which led to changes in the SP.

Regarding SP per se, 62 guardians (33.7%) reported that the sport practiced by their children could be, and was at some point, practiced wearing a mask. There was a statistically significant reduction ($p < 0.01$) in the use of changing rooms since, after the beginning of the pandemic, only 86 (48.9%) children used the changing rooms after SP compared to 129 (69.4%) before the start of the pandemic.

Regarding the type of sport practiced, of the 160 children who suspended sports practice during the pandemic, 80 (50.0%) resumed their usual SP, 33 (20.6%) resumed and suspended it by extraordinary government measures in the context of the pandemic, 12 (7.5%) started to practice sports only online and 35 (21.9%) changed their sport. The factors that influenced these children's return to sports were parental sports activity (father $p = 0.03$; mother $p = 0.02$) and the practice of competitive sports ($p = 0.05$). Thus, as with SP, for

Table 3. Sports practiced by children

Football*	Swimming†	Dancing
Roller skating	Martial arts	Gym
Handball	Horse riding	Basketball
Table tennis	Tennis	Gymnastics
Athletics	Volleyball	Cycling

Football and swimming were the most-commonly reported sports.
*22 children (15.5%).
†27 children (19.0%).

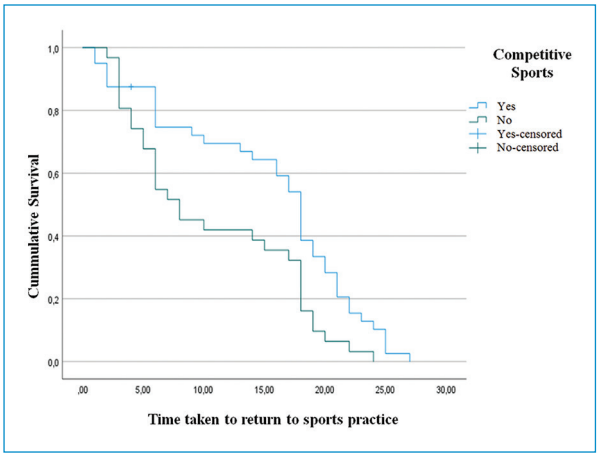


Figure 2. Kaplan Meier survival curve assessing return to sports practice among children who practice competitive and non-competitive sports.

sports resumption, if the parents practice sports, it is more likely that the child will resume sports after a period of inactivity. The return to sports was more significant for the group of children who practiced sports competitively.

Of the variables studied, the only one that influenced the earlier resumption of sports activity was the practice of competitive sports (Fig. 2) log-rank: 7.092 (p = 0.008).

Of the children who did not practice sports regularly outside of school, 13 (9.7%) started sporting activities after the start of the pandemic.

Discussion

Sport is important for creating bonds between children, something that was somewhat interrupted by the COVID-19 pandemic[7].

The change in SP and the decrease in the use of changing rooms after the start of the pandemic was expected and verified in this study. Do not forget that in our population the most-practiced sports were team sports or water-based sports, so parental involvement is one of the factors to be taken into account[8] and, in the case of swimming, many pools had not yet opened to the public when this survey was carried out.

This paper focuses on the factors that lead to SP in children in order to then identify key points and strategies to encourage SP in this age group. From our findings, and this is consistent with literature more generally[7,9-12], the parental role is crucial in providing a trigger for the uptake of SP, which must then be perpetuated with the child. Therefore, SP promotion strategies should, in an initial phase, start at the parental level: to raise awareness of its importance and provide mechanisms to encourage SP in their children, as well as positive feedback for its continuation[11].

Furthermore, children engaged in competitive sports showed a considerably higher likelihood of returning to sports earlier than their peers (p = 0.05). The graph illustrating the influence of competitive sports on the timing of sports resumption, with a log-rank of 7.092 (p = 0.008), emphasizes the significance of structured, competitive sports programs in motivating children to re-engage in SP swiftly.

Despite there being three different districts from a demographic point of view between Porto (more urban) and Viseu/Vila-Real (more rural), there were no significant differences in terms of SP in the sample. This is because, even though there is a greater selection of sports and clubs for SP in Porto, the districts of Viseu and Vila-Real have a long tradition in terms of sport, something that seems to have passed from generation to generation and that remains in children today.

One limitation of our study relates to the questionnaire applied. Despite being based on tools already validated in other countries, they have not been validated for our population and only provide a qualitative assessment of the participant's SP. In future, it would be important to create and use a validated tool for this age group, to make a formal and quantitative assessment of SP and the factors that influence this, considering the results shown in this article and literature more generally.

Also, the 10% of children in the sample who began SP after the start of the pandemic should not be underestimated. In Portugal, and across Europe, we live in an era of globalization and technological expansion, which is leading to a progressive increase in screen time. Despite the well-documented harm that these tools can bring, they can also be used to promote SP, and the influence of certain figures in media, such as social networks and television, should not be overlooked. It is important that digital influencers and public

figures also play an active role in promoting SP. It would also be interesting to evaluate and quantify the role of these new ways of promoting SP in children in a future study.

This study not only emphasizes the positive influence of parental involvement but also underscores the importance of structured competitive sports in encouraging children to quickly resume physical activities. Understanding these factors can inform strategies that promote sports participation among children, ultimately contributing to their overall health and well-being. Thus, it is essential to raise parents' awareness of their active role in their children's lives in promoting physical activity, to bring children closer to a healthier lifestyle from a physical and mental point of view[7,12].

Awards and prior presentations

Some of the results from this paper were submitted and presented at the 9th Congress of the European Academy of Paediatric Societies, in Barcelona, and at the 22nd Congresso Nacional de Pediatria, in Porto, both in 2022.

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None.

Conflicts of interest

None.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Use of artificial intelligence for generating text. The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

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