



Lessons from COVID's social distancing in the Physical Education class

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Cite this article

Saiz-González, P., Fernández-Río, J. & Iglesias, D. (2023). Lessons from COVID's social distancing in the Physical Education class. *Apunts Educación Física y Deportes*, 154, 52-60. [https://doi.org/10.5672/apunts.2014-0983.es.\(2023/4\).154.05](https://doi.org/10.5672/apunts.2014-0983.es.(2023/4).154.05)

Editor:

© Generalitat de Catalunya
Departament de la Presidència
Institut Nacional d'Educació
Física de Catalunya (INEFC)

ISSN: 2014-0983

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Section:

Physical Education

Original language:

English

Received:

December 2, 2022

Accepted:

March 22, 2023

Published:

October 1, 2023

Front cover:

An athlete
doing parkou.
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Adobe Stock.

Abstract

The present study aimed to analyze the impact of maintaining or not social distancing on the satisfaction of basic psychological needs and the intention to be physically active of Primary Education students in Physical Education. A quasi-experimental design with pre-test-post-test measures was used. A total of 149 students (72 boys, 77 girls; 9-12 years old) from eight classes of a school in northern Spain (75 in 5th grade, 74 in 6th grade) participated. The data obtained are the result of the comparison between two eight-session educational interventions: one in the experimental group ($n = 74$), in which social distancing was maintained at all times, and another one in the control group ($n = 75$), where the same proposals were developed, but social distancing was not maintained. It was found that no variable was affected by the maintenance of social distancing and, in addition, the students' competence-satisfaction increased significantly only in the group that experienced it. Thus, this study found that, contrary to expectations, due to the "social" nature of the subject, the imposed distancing had no negative effects in the short term.

Keywords: autonomy, competence, primary education, relatedness, students.

Introduction

In 2019, COVID-19 appeared abruptly in our lives changing, among many other things, the educational system as we knew it. Most countries ordered mandatory home isolation, forcing teachers to go online teaching with hardly any training. Unfortunately, a systematic review (Viner et al., 2021) reported the association between school closures and harm to the health and well-being of children and youths.

To avoid the negative impact of the lockdown, in the 2020-21 academic year, the educational administrations moved back to face-to-face teaching, providing a plethora of changes, including rules and recommendations to guarantee a safe back-to-school (Filiz & Konukman, 2020). National and international organizations (CDC, 2020; European Physical Education Association, 2020; UNICEF, 2020) published basic principles and guidelines for COVID-19 prevention when reopening educational facilities. Wearing face masks in the school setting, constant disinfection of materials and facilities, and maintaining a physical distance of at least 3 feet (1 meter) were common key takeaways from these administrations. This last rule was seen as a true challenge in physical education, especially difficult to follow because of its social character, with frequent contact among students. As a consequence of the difficulties faced, individual teachers, as well as professional organizations (James [@kjamespe], 2020; Professional Development Service for Teachers, 2020), developed sets of activities following the international guidelines for COVID-19 prevention, which included avoiding team sports to elude contact among players (Filiz & Konukman, 2020), and the promotion of students' autonomy and self-regulated learning (Fernández-Río, 2020). Additionally, professional organizations such as the Physical Education Association of Ireland (2020) offered their expertise to the teachers designing a traffic light system to evaluate the risk involved in the physical education activities to be used in class. In the United Kingdom, the Association for Physical Education (2020) analyzed the government guidance for the context of physical education and developed suggestions based on it. In Spain and Canada, the General Council of Physical Education and Sports (2020) and the Physical and Health Education Canada (2020) developed documents with pedagogical recommendations for a safe return to in-person physical education after the online

schooling period. Despite the difficulties for teachers and students, they all highlighted how important it was to maintain social distancing in the physical education class.

The scarce previous research conducted on the impact of the COVID-19 pandemic on physical education has focused on teachers. Varea and Gonzalez-Calvo (2021) assessed the effects of the social distancing imposed on a group of pre-service physical education teachers during their practicum, which was conducted online. The authors concluded that the future teachers believed that the subject was losing its identity because of the lack of direct contact and that the teacher education programs should prepare better their students to teach physical education online. On his part, Howley (2022) conducted a study across different countries which faced the same online remote teaching in physical education. Although inequity hindered the analysis of a uniform experience, Howley (2022) uncovered issues such as flexibility in implementation and assessment, narrow (traditional) pedagogical approaches with an emphasis on physical activity and exercise, and lack of social and emotional support for students and equitable access. He concluded that traditional approaches to teaching and learning fell short facing the new situation and that there is a need for continuous professional development on remote and/or blended learning. In Sweden, where schools did not close at any time throughout the pandemic, physical education teachers also decreased physical contact with their students (Kamoga & Varea, 2022). They reported experiencing a challenge while teaching due to the significant changes in the context confronted, the content implemented, the roles experienced and the responsibilities faced, which included avoiding physical contact and enforcing social distancing. Along the same line, Hortigüela-Alcala et al. (2021) found that primary, secondary and future physical education teachers highlighted the negative impact of social distancing, which limited the content to be taught. Therefore, the "new reality" brought by the COVID-19 pandemic has imposed changes in the way physical education is taught in schools worldwide, where physical contact among the students and with the teachers was part of the class (Varea et al., 2022). Research showed that social distancing was an issue for many physical education teachers. Some even admit in private that they cannot maintain it in many classes because they lack enough resources and materials for

all the students or because they do not believe in “this new” physical education, and they focused on wearing masks at all times and reinforcing hygiene. The question is: what about the students? What do they think of the “new context”?

Self-Determination Theory (Deci & Ryan, 1985) is one of the leading theoretical frameworks used to study and understand individuals' behavior, including motivation. It includes five mini-theories, one of them being the Basic Needs Theory (Ryan & Deci, 2002). Used in the context of physical education (Diloy-Peña et al., 2021; Vasconcellos et al., 2020), it describes the existence of three basic psychological needs in any individual: a) Autonomy: which is the desire of being responsible for one's behaviors; b) Competence: it is the personal perception of being effective when performing a task; and c) Relatedness: it is the sense of belonging to a group. Research has shown that each one of these needs can be promoted or thwarted depending on the teacher's decisions (Deci & Ryan, 2000). Basic psychological needs' thwarting promotes less self-determined types of motivation: extrinsic (to perform an activity to please others) or even amotivation (not to have the desire to perform an activity) and negative consequences such as anxiety or lack of effort (Vasconcellos et al., 2020). On the other hand, promoting the individuals' basic psychological triggered the most self-determined types of motivation: intrinsic motivation (to perform an activity for pleasure), and positive consequences, such as better interpersonal relations, learning, or enjoyment (Deci & Ryan 2016). Moreover, it has also been linked to an increase in students' moderate-to-vigorous physical activity (Grasten et al., 2021). This is extremely important in a world where physical inactivity is high and is linked to negative health consequences (Sallis et al., 2021).

In this trend, research has shown that school contexts can become perfect scenarios to promote students' regular physical activity practice and help them avoid sedentary behaviors (Tremblay et al., 2016). Therefore, “the goal of physical education is to develop physically literate individuals who have the knowledge, skills, and confidence to enjoy a lifetime of healthy physical activity” (Shape America, 2021). One of them is adherence to a physically active lifestyle (Silva et al., 2018). Physical education teachers can promote their students' basic psychological needs by avoiding controlling teaching

styles, which can also damage their self-determined motivation (Trigueros et al., 2019). This type of motivation has also been found to positively predict the students' intention to be physically active in their free time (Hagger & Chatzisarantis, 2016).

Based on the aforementioned, two questions arise: what has been the impact of COVID-19 on the students in the physical education class? How did it affect their behaviors, values, or intentions? Most of the existing published research has focused mainly on the impact of the COVID-19 pandemic on teachers (Hortigüela-Alcala et al., 2021; Howley, 2022; Kamoga & Varea, 2022; Varea et al., 2022; Varea & Gonzalez-Calvo, 2021). One previous study focused on physical education students revealed that students retrospectively reported that COVID-19 safety measures generated emotional changes in students (Hortigüela-Alcala et al., 2022). Thus, it seems vital to assess the effects of one of the most widely mentioned consequences of the pandemic, in-class social distancing, on students from inside the physical education class to understand it and be able to adjust. Therefore, the main goal of the present study was to analyze the impact of maintaining, or not, in-class social distancing on students' basic psychological needs and their intentions to be physically active. The first hypothesis was that the students' basic psychological needs would be negatively affected. The second hypothesis was that their intentions to be physically active would be negatively affected too.

Methods

Participants

A quasi-experimental research design with experimental and control groups and pre-test-post-test measures was conducted (Dimitrov & Rumrill, 2003). A total of 149 students agreed to participate in the study, selected through non-probabilistic purposive sampling. They were enrolled in eight primary education classes in a school located in northern Spain (75 students in 5th grade and 74 students in 6th grade). The sample consisted of 72 boys (48%) and 77 girls (52%) aged between 9 and 12 years ($M = 10.43$, $SD = 0.61$). Of the 149 participants, 74 (two classes of 5th grade and two classes of 6th grade) constituted the experimental group (which experienced

activities with 1.5 meters of social distancing during the whole session) and 75 (two classes of 5th grade and two classes of 6th grade) constituted the control group (which did not experience social distancing during the classes). All the sessions were coordinated by one of the authors of this work, and a teacher at the school, and implemented by a total of four teachers (one for each of the two class groups). The teachers (like all others everywhere) had no previous experience in such extraordinary circumstances like the ones caused by COVID-19 and they were forced to adapt their teaching and their classes to this new and changing context.

Instruments

Sociodemographic variables. Information was collected on three individual variables: gender, age, and grade level.

Basic psychological needs. To assess the satisfaction (or not) of these needs, the subconstruct *Satisfaction* of the Spanish-validated version (Longo et al., 2018) of the Basic Psychological Needs Satisfaction and Frustration Scale (Longo et al., 2016) was used. Through this Likert-type scale with seven response options (from one: “totally disagree” to seven: “totally agree”), students' feelings of satisfaction with their autonomy, competence, and relatedness were assessed. There are seven response options to sentences headed by: “I feel that...”. Three dimensions can be obtained in this scale: Autonomy-satisfaction (e.g., “...I have the freedom to decide how to do things”), competence-satisfaction (e.g., “...I am pretty good at the things I do”), relatedness-satisfaction (e.g., “...I matter to the people around me”). In the present study, Cronbach's alphas were: autonomy: .82 and .90, competence: .80 and .78, and relatedness: .83 and .89 on the pre-test and post-test, respectively.

Intention to be physically active. To evaluate the intention of the participating students to be physically active, the Spanish-validated version (Moreno et al., 2007) of the Intention to be Physically Active Scale of Hein et al. (2004) was used. It is a Likert-type scale composed of five items (e.g., “Apart from physical education classes, I like to practice sports”) preceded by the stem: “Regarding your intention to practice physical-

sports activity...”. It presents 5 response options, where one corresponds to “totally disagree” and five to “totally agree”. In the present study, Cronbach's alphas were: .65 and .69 in the pre-test and post-test, respectively.

Procedure

First, permission was obtained from the Ethics Committee of the researchers' university (023/2022). Secondly, prior to the implementation of the program, the research team contacted the target school and the teachers involved to fully explain the study. Permission to conduct the study was obtained and all signed written consent. Then, the families involved were contacted to explain the project. Those willing to let their children participate signed a written consent explaining the purpose of the project, the option of completing the questionnaires or quitting the study at any time, the anonymity of the data processing, and that the project will not affect their grades. All participants were treated according to the ethical guidelines provided by the American Psychological Association (2019). Data collection was carried out before and after the intervention. The teachers offered the questionnaire to the students, who completed it in the class before the first session of the intervention program and after the last one.

Intervention program

The data obtained in this study were the result of the comparison between two educational interventions (learning units), eight sessions long, conducted in physical education: one in the experimental group, where an in-class social distance of 1.5 m was maintained at all times (including breaks, teacher's explanations, and students' performance) and another one in the control group, where the same activities were used, but in-class social distance between students was not enforced by the teachers. All participating students had previous experience with in-class social distancing (prior to the intervention, COVID-19 measures had been withdrawn, and physical education classes were conducted without social distancing and face masks). The research team carefully designed all activities and sessions based on proposals from different organizations and individuals to maintain in-class social distancing (Fernández-Río, 2020; Filiz & Konukman, 2020; James [@kjamespe],

2020; Professional Development Service for Teachers, 2020). These included non-contact, open-ended (multiple valid solutions), self-regulated tasks to work on basic locomotor (e.g., running, jumping, sliding, skipping) and non-locomotor skills (e.g., throwing, catching, turning). The structure of the sessions was the same for the experimental and the control groups: (1) warm-up and activation, (2) main part, and (3) return to calm. Four different teachers, including one of the authors, implemented the proposal designed during the same weeks (at this point in the pandemic, some authorities recommended social distancing during the school period, but there was no rule requiring it). All students wore facemasks during the sessions. Two of the teachers, long before the beginning of the study, had been conducting their physical education classes without enforcing the 1.5 m in-class social distancing recommendation, and they agreed to participate in the study, to include their classes in the control group and to follow the same learning unit than the experimental group (with minimal adaptations of the activities), but no social distancing was enforced. Students in the experimental group did not share any material, while those in the control group did. The research team supervised that each study group was taught, at all times, according to the teacher's decision: with or without enforcing in-class social distancing. For this purpose, a researcher was present during the sessions. Furthermore, all sessions were recorded and 40% were randomly selected to evaluate the correct implementation of the program. Results showed that 100% of lessons complied with the selected framework.

Data analysis

Analyses were performed using IBM SPSS Statistics v.24.0 software (SPSS Inc., Chicago, IL, USA). First, normality tests were conducted. The results of the Kolmogorov-Smirnov test revealed that data was not normally distributed. However, F-statistics are still considered a valid statistical procedure when there is no normality, but the skewness and the kurtosis are between -1 and 1 (Blanca et al., 2017). For this study, all values before and after the intervention were in this range, except for the relatedness-satisfaction and autonomy-satisfaction variables after the intervention, which obtained a skewness value of -1.17 and

a kurtosis value of -1.17 , respectively. So, it was possible to perform parametric tests. Descriptive statistics (means and standard deviations) were calculated for each group and gender before and after the intervention. To compare between-groups and within-group differences, a $2 \times 2 \times 2$ group (experimental/control) \times test time (pre- and post-intervention) \times gender (boys and girls) multivariate analysis of variance was performed. Effect sizes (Cohen, 1988) were calculated using the partial eta-squared statistic (η_p^2), considering small ($> .01$), medium ($> .06$), and large ($> .14$). Statistical significance was established at $p \leq .05$ (95% CI).

Results

Between-group pre-post-intervention analysis

For boys, no significant multivariate effect was found (Wilks' lambda = .99, $F = 0.23$, $p = .92$, $\eta_p^2 = .02$) in the experimental group in contrast with those students who did not maintain social distancing during the intervention (control group). The pairwise analysis showed no significant differences between the boys who maintained social distancing and those who did not. For girls, a significant multivariate effect with a large effect size was found (Wilks' lambda = .80, $F = 4.24$, $p = .004$, $\eta_p^2 = .20$). Pairwise analysis in girls showed significant differences between groups for autonomy-satisfaction both before ($p < .001$) and after the intervention ($p < .001$), being higher for the experimental group at all times.

Within-group pre-post-intervention analysis

No significant multivariate effect was found for any of the variables under study for boys (Wilks' lambda = .96, $F = 0.66$, $p = 0.63$, $\eta_p^2 = .04$) or girls (Wilks' lambda = .98, $F = .27$, $p = .89$, $\eta_p^2 = .02$) maintaining social distancing at all times. Additionally, no significant differences were again found for boys and girls in the pairwise comparisons between the pre-intervention and post-intervention scores, except for a significant improvement in the competence-satisfaction of boys in the experimental group (see Table 1).

Table 1

Descriptive statistics, between-group post-intervention and within-group pre-post-intervention analysis of each dependent variable.

Variables	Gender	Pre-intervention (experimental group)	Post-intervention (experimental group)	<i>p</i>	95% CI	Pre-intervention (control group)	Post-intervention (control group)	<i>p</i>	95% CI
		<i>M</i> (SD)	<i>M</i> (SD)			<i>M</i> (SD)	<i>M</i> (SD)		
Autonomy-satisfaction	Boys	3.96 (1.58)	4.04 (1.84)	.72	[-0.53, 0.36]	3.85 (1.76)	3.92 (2.05)	.76	[-0.53, 0.39]
	Girls	5.09 (1.50)*	5.18 (1.47)*	.70	[-0.51, 0.34]	3.79 (1.31)*	3.76 (1.64)*	.92	[-0.40, 0.45]
Competence-satisfaction	Boys	5.35 (1.30)	5.76 (1.23)	.03**	[-0.78, 0.03]	5.47 (1.06)	5.45 (1.10)	.89	[-0.36, 0.42]
	Girls	5.26 (1.46)	5.50 (1.32)	.19	[-0.6, 0.12]	4.86 (1.18)	5.16 (1.09)	.10	[-0.66, 0.06]
Relatedness-satisfaction	Boys	5.44 (1.14)	5.56 (1.54)	.60	[-0.55, 0.31]	5.31 (1.33)	5.22 (1.60)	.68	[-0.35, 0.53]
	Girls	5.51 (1.63)	5.80 (1.37)	.18	[-0.69, 0.13]	5.25 (1.62)	5.48 (1.60)	.59	[-0.64, 0.18]
Intention to be physically active	Boys	4.24 (0.76)	4.38 (0.70)	.14	[-0.34, 0.05]	4.20 (0.68)	4.17 (0.70)	.80	[-0.17, 0.22]
	Girls	4.28 (0.74)	4.25 (0.69)	.74	[-0.15, 0.22]	4.15 (0.73)	4.24 (0.73)	.31	[-0.28, 0.09]

Note: Between-group pre- and post-intervention analyses are reported with an asterisk (*) when $p < 0.05$; within-group pre-post-intervention analyses are reported with two asterisks (**) when $p < 0.05$.
M: mean; SD: standard deviation; CI: confidence interval.

Discussion

The present study aimed to assess the impact of maintaining, or not, in-class social distancing on students' basic psychological needs and their intentions to be physically active. The results showed that no variable was affected by the enforcement of social distancing. Furthermore, competence-satisfaction increased for boys who experienced social distancing after the intervention compared to before the intervention.

The first hypothesis was that the satisfaction of the psychological needs of the participating students would be negatively affected, and the results showed that it was not supported, since two needs experienced no changes (the values were maintained) and the third one, competence-satisfaction, significantly improved for boys in the group where social distancing was implemented in class after the intervention compared to before the intervention. These results indicate that students did not negatively experience social distancing in class. Consequently, it did not damage the satisfaction of their basic psychological needs and even increased their feelings of competence at the end of the intervention. Unfortunately, to our knowledge, there are no published studies that specifically assessed the effects of physical distancing on students to compare the results obtained in the present study. Previous studies on the impact of schools' physical education context resulting from the COVID-19 pandemic mainly focused on teachers and reported difficulties and concerns due to the lack of direct contact with pupils, changes in the context confronted, the content implemented, the roles experienced and the responsibilities faced (Howley, 2022; Kamoga & Varea, 2022; Varea & Gonzalez-Calvo, 2021). Perhaps the fact that students in the experimental condition were asked to regulate their performance, to work independently, in their own space, and at their own pace was positive to improve their competence-satisfaction. Moreover, in this group, where social distancing was constantly reinforced, students were able to work without the pressure exerted by their peers, which sometimes can pose a negative influence on their performance (Ruiz Pérez et al., 2018). Previous research found that students' peer influence appears to guide adolescents' emotional, cognitive, and behavioral engagement (Wang et al., 2018). The enforced in-class social distancing may have prevented this constant comparison and avoided outcomes such as negative peer pressure. In contrast, in the groups where social distancing was not maintained, students, although they had the same individual tasks, could interact with each other, and perhaps even exert the aforementioned negative peer pressure. Of course, this

is speculative at this time and more research is needed to confirm or reject these ideas.

Despite reducing the possibilities of movement and socialization in the experimental group, students' autonomy-satisfaction and relationship-satisfaction were not affected and, even, competence-satisfaction increased for boys in the experimental group after the intervention compared to before the intervention. Several reasons could be argued to try to explain these positive trends found: (a) despite the enforced in-class social distancing, there continued to be rapport (relatedness) among the students (e.g. they could talk, laugh, encourage each other or ask each other questions during the completion of the tasks), and b) students had to perform all the tasks independently (they could not expect other classmates to do the tasks for them) and, therefore, they could rely only on themselves (autonomy). In other words, teachers supported the development of the student's basic needs (competence, autonomy, and relatedness), and the enforced in-class social distancing not only did not frustrate their development but in some cases (competence) promoted it. A recent systematic review of self-determination theory applied to physical education raised the possibility that peer support could lead to the satisfaction of all students' needs (Vasconcellos et al., 2020). The present study indicates that, at certain times, the absence of social interaction might also be beneficial to the satisfaction of students' needs. Perhaps, not only peer support could favor the satisfaction of the basic psychological needs, but the hypothetical absence of negative interrelationships could also have a positive impact on these needs. These ideas have a certain speculative character at this time, and more research is needed to confirm or refute them.

The second hypothesis was that the students' intention to engage in future physical activity would be negatively affected by social distancing. The results showed that it was not supported, as there were no significant differences after the intervention. Unfortunately, to our knowledge, there are no similar published studies to compare the results obtained in the present one. Nevertheless, previous research (Trigueros et al., 2019) found that there is a direct connection between the satisfaction of individuals' basic psychological needs and the most self-determined types of motivation, which, in turn, can predict students' intention to participate in physical activities in their free time (Hagger & Chatzisarantis, 2016). Therefore, considering that in the present study the satisfaction of the students' basic psychological needs was not negatively affected by the enforced in-class social distancing, their intentions to perform physical activity in the future were not negatively affected either. These results are in line with those obtained by Jang et al. (2021) in a

sample of adults during the COVID-19 pandemic in South Korea, where the satisfaction of the participants' basic psychological needs remained significantly related to their physical activity intentions. The results obtained in the present study could be considered noteworthy because they showed that the imposed social distancing did not negatively affect the students' healthy behavioral intentions such as future physical activity practice. Again, these ideas may be considered speculative at this time, and more research is needed to confirm or refute them.

Finally, the present study is not without several limitations. Firstly, it was based on an eight-session intervention program, which could be considered too short. Future studies should use a larger number of sessions to test the medium- and long-term effects of in-class social distancing. Secondly, the proposal was carried out in a single school. Future research should include different schools to encompass different populations and socioeconomic contexts. Thirdly, the particular characteristics of the students analysed, as well as the nature/type of the activities carried out during the intervention, establish a particular educational situation and therefore there is a limitation when attempting to generalize the data. Further, the teachers could have influenced the results, since they were not the same for the experimental and the control groups. Finally, a fifth limitation may be the quantitative nature of the research. Future studies should be based on qualitative or mixed research designs to achieve a global and more in-depth view of the problem under investigation.

Conclusion

In the short-run, the in-class social distancing recommended in the physical education classes did not hurt the satisfaction of the basic psychological needs of primary school students, nor their intention to engage in physical activity. On the contrary, the satisfaction of their competence was significantly increased for boys only in the group that experienced social distancing after the intervention compared to before the intervention. To our knowledge, this is the first study conducted on the impact of COVID-19 and specifically on one of the measures proposed to address it, social distancing, on the students in the physical education class. Contrary to the expectations, due to the "social" nature of the subject, the imposed distancing had no negative effects in the short-term and even increased the students' competence-satisfaction for boys in the experimental group after the intervention compared to before the intervention. More studies are needed to better understand the effects of the pandemic, but some decisions (measures) do not seem to have negatively affected students.

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Conflict of Interests: No conflict of interest was reported by the authors.



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