2024, Retos, 56, 228-237
© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

Impact of an intervention program based on self-determination theory on basic psychological needs, intention to be physically active and life satisfaction of high school students: A longitudinal study

Impacto de un programa de intervención basado en la teoría de la autodeterminación sobre las necesidades psicológicas básicas, la intención de ser físicamente activo y la satisfacción con la vida de estudiantes de secundaria: Estudio longitudinal

*Javier Lamoneda Prieto, **Michelle Matos-Duarte, **Eulisis Smith Palacio, **Juan Fraile
*Junta de Andalucía (España), **Universidad Francisco de Vitoria (España)

Abstract. Based on Self-determination Theory (SDT), this study, carried out over a year, analyzed the effects of an educational intervention program on the motivation, life satisfaction and interest in physical fitness in students during the COVID-19 pandemic. A total of 114 high-school students participated in the study (M_{age}=17.18, SD=1.05), which followed a high-dimensional one-group repeated-measures design. The students underwent two iterations of the SDT-based program: one that did not factor in the pandemic (T2), and another that did (T3). Data was gathered using validated self-reporting questionnaires administered both before (T1) and after the intervention (T2, T3). The results showed that the intervention program managed not only to maintain the motivational levels of competence and relatedness with regards to Physical Education (PE), but also improved levels of autonomy; maintained levels of interest in being physically active and life satisfaction. Moreover, the program reduced the initial gender differences in the interest in being physically active and the need for relatedness. Finally, results did not show statistically significant differences between sex after the interventions carried out (T2, T3). In conclusion, these results underline the success of the program in achieving its general objective of fostering intrinsic motivation and life satisfaction through physical education, effectively adapting to the challenges posed by the pandemic.
Keywords: Self-determination Theory, Physical Education, COVID-19, physical activity, intervention, satisfaction of autonomy

Resumen. Basado en la Teoría de la Autodeterminación (TAD), este estudio, realizado a lo largo de un año, analizó los efectos de un programa de intervención educativa sobre la motivación, la satisfacción vital y el interés por la condición física en estudiantes durante la pandemia de COVID-19. Un total de 114 estudiantes de secundaria participaron en el estudio (M^{edad}=17,18, SD=1,05), que siguió un diseño unidimensional de medidas repetidas en un grupo. Los estudiantes se sometieron a dos iteraciones del programa basado en TAD una que no incluía la pandemia (T2) y otra que sí (T3). Los datos se recopilaron mediante cuestionarios de autoinforme validados que se administraron antes (T1) y después de la intervención (T2, T3). Los resultados mostraron que el programa de intervención consiguió no sólo mantener los niveles motivacionales de competencia y relación con respecto a la Educación Física (EF), sino que también mejoró los niveles de autonomía; mantuvo los niveles de interés por ser físicamente activo y de satisfacción vital. Además, el programa redujo las diferencias iniciales de género en el interés por ser físicamente activo y la necesidad de relación. Por último, los resultados no mostraron diferencias estadísticamente significativas entre sexos tras las intervenciones realizadas (T2, T3). En conclusión, estos resultados subrayan el éxito del programa en la consecución de su objetivo general de fomentar la motivación intrínseca y la satisfacción vital a través de la educación física, adaptándose eficazmente a los retos planteados por la pandemia.
Palabras clave: Teoría de la Autodeterminación, Educación Física, COVID-19, actividad física, Intervención, satisfacción de autonomía

Fecha recepción: 09-01-24. Fecha de aceptación: 08-04-24
Eulisis Smith Palacio
e.smith@ufv.es

Introduction

The COVID-19 pandemic has been one of the most important challenges facing the education system in general and physical education (PE) in particular. The preventive measures taken to deal with the pandemic have aggravated to an even greater degree the already alarming levels of physical inactivity among adolescents (Dunton et al., 2020; Xiang et al., 2020) where almost 80% do not meet the recommended minimum levels of physical activity (Guthold et al., 2020). On a psychological level, social distancing has caused emotional distress and mental disorders such as anxiety and depression (Brooks et al., 2020). In recent years, a large body of research has been published on motivation in the field of physical activity, mainly through Self-Determination Theory (SDT), widely considered to be a robust theoretical framework for the analysis of human behavior (Ryan & Deci, 2017) and the practice of physical activity (Ryan & Deci, 2020). This theory points to the importance of the environment, social relations and predisposition to initiatives as an educational tool. It is especially relevant in the field of PE due to the close teacher-student relationship, which can positively affect the acquisition of healthy lifestyle habits and the development of behavioral competences. It is therefore potentially of great importance in dealing with physical inactivity, even more in difficult times such as those caused by COVID-19.

Basic Psychological Needs

The Self-determination Theory (SDT) of Deci and Ryan (2000) is no doubt one of the constructs which permits a deeper understanding of motivation among adolescents. The reasons why individuals carry out physical activity are on a continuum of autonomy, extending from the lowest levels to the highest levels of self-determination (Deci et al., 2017; Franco et al., 2017; Ntoumanis & Standage, 2009). The theory is structured around three essential elements: intrinsic motivation, extrinsic motivation and amotivation. Intrinsic motivation refers to the practice of physical activity in search

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

of one's own satisfaction. Extrinsic motivation refers to the practice of physical activity in the search for results, valuing the psychobiological and social benefits that the practice of physical activity provides. Finally, amotivation refers to the absence of interest in the practice of physical activity (Deci & Ryan, 2008; Krause et al., 2019).

This theory also maintains that social context can have a direct influence on the motivation to practice physical activity. This is related to the satisfaction of basic psychological needs (BPN) which are universal and innate: autonomy, competence and relatedness (Morillo et al., 2018). According to Niemec and Ryan (2009), autonomy is the perception of the individual that they are the originator and controller of their own behavior. Competence refers to a person's feeling of self-sufficiency in performing a task (Deci & Ryan, 2000). Relatedness is the feeling of belonging to a specific group or social environment (Vlachopoulos & Michailidou, 2006). Deci and Ryan (2004) identified a positive relation between the satisfaction of an individual's need for autonomy, competency and relatedness and increased intrinsic motivation.

To these three BPN a fourth was added: the need for novelty (González-Cutre et al., 2014; Vansteenkiste et al., 2020). This is considered as the need to experience something new, not experienced before and which is radically separate from routine habits.

Physical activity, motivation and adolescence

The national emergency caused by Covid 19 up to February 10, 2021, with a total number of confirmed cases of 106,125,682, brought with it total lockdown isolation in order to protect the population. These anti-contagion policies greatly minimized the transmission of the virus (Wolf et al., 2021). However, these actions on the population also brought about anxiety, post-traumatic stress and depressive disorders. Adolescents have not been exempt from these consequences, exacerbating what is an already complicated evolutionary stage for them. In this sense, the development of PE classes and as a whole the emotional experiences and adherence to physical activities have been affected to a greater extent (Hossain, 2020).

Several authors have confirmed the importance of physical activity in the development of the individual, including the prevention of obesity, more balanced psychological states, the prevention of anxiety and depression and the acquisition of lifelong healthy habits (e.g., Franco et al., 2017).

According to the Theory of Planned Behavior (Ajzen, 1991), the intention to play sports or carry out physical activity expressed by children and adolescents can be a good indicator of their motivation and a strong predictor of their future behavior. The relation between certain motivational variables and the expressed intention to practice sports and physical activity has been the subject of much research from the perspective of Achievement Goal Theory (Nicholls, 1989), the latter being of note as a source of general wellbeing among students. Achievement Goal Theory studies how an individual relates to a goal, seeking the causes, direction, consequences, commitment and responsibility. According to this theory, there are two predominant aspects in the intention to play sports: activities in which the ego is predominant and activities in which compliance with a task and personal performance are. These aspects are the result of dispositional factors (motivational orientation) and contextual factors (motivational climate).

PE and life satisfaction

According to Guthold et al. (2020), the objectives of PE include the satisfaction of personal needs and social goals through physical activity, achievement motivation and basic psychological needs in order to maintain an active lifestyle. However, little research has looked at the relation between this set of variables for life satisfaction and the COVID-19 pandemic. Satisfaction is linked to the self-perception of the student and their perceived effectiveness in their social environment (Martín-Albo et al., 2009). From this perspective, it would appear that life satisfaction is associated with the social relations of the adolescent within their immediate environment as well as enhanced self-esteem (de Looze et al., 2019). In addition, social support from friends and family seems to facilitate the improvement of skills to participate in social activities and to motivate the practice of physical activity (Doshybekov et al., 2024; Tao et al., 2019).

To date, studies into motivation in the field of PE have focused principally on two lines of research. Firstly, on identifying shortcomings in strategies for dealing with the frustration of BPN (Trigueros, Aguilar-Parra, et al., 2019) and its negative impact on motivation (Haerens et al., 2015) and learning (Trigueros, Mínguez, et al., 2019). Secondly, on the positive effects of interventions which support autonomy in BPN satisfaction (Taylor & Lonsdale, 2010), self-motivation towards PE (Yli-Piipari et al., 2009) and the influence of the latter in the acquisition of healthy lifestyle habits (Bartholomew et al., 2018; Trigueros, Mínguez et al., 2019) and on the effectiveness of building resilience in adolescents (Guo & Liang, 2023). It is important to make two additions to the above.

Firstly, levels of satisfaction of BPN differ according to age, gender and organization of the activity (García-Pérez et al., 2024; Lamoneda & Huertas, 2019) - although there exist discrepancies in the consideration of these differences according to gender (Brunet & Sabiston, 2009). Secondly, in PE, the satisfaction of BPN is a useful strategy to enhance the wellbeing of adolescents (McDavid et al., 2017), participation in physical activity, improved health (Babic et al., 2014) and motivation to participate in PE classes (Deci & Ryan, 2016). Studies have shown that participation in recreational activities and life satisfaction in general are indicators of BPN satisfaction (Leversen et al., 2012).

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

Physical Education during COVID-19

The teaching of PE during the COVID-19 pandemic has been the subject of a great deal of research, extensively analyzing positive effects on students (Dunton et al., 2020; Xiang et al., 2020), the experience of teachers (Mercier et al., 2021) or considerations for effective planning (Webster et al., 2021). However, there are few studies on intervention programs in PE carried out during this period (Mercier et al., 2021).

A literature review of seventy-three articles that had as its fundamental focus the study of the incidence of Self-Determination Theory SDT on the phenomena of motivation and physical health behaviors, found positive effects on physical and psychological health, need for support and autonomous motivation (Ntoumanis, eta al 2021). These reasons reinforce the need to use SDT as a program in educational intervention in young people.

Aim and Research Questions (RQ)

The principal aim of this study was to analyze the effect of an intervention program in PE based on SDT for basic psychological needs (BPN), life satisfaction and the intention to be physically active. A further goal was to analyze possible differences between the program with and without a pandemic. Accordingly, the three research questions (RQs) explored what the effects on basic psychological needs (RQ1), life satisfaction (RQ2), and the intention to be physically active(RQ3) were. In this context, it was hypothesized that the SDT-based program during the COVID-19 pandemic would maintain or improve the scores for these variables compared to the reference values.

Method

Participants

114 students (M_{age}=17.18 ± 1.05; 49 boys, 65 girls) enrolled in year-11 (three groups) and year-12 (four groups) of a high school in southern Spain. Non-probabilistic, convenience sampling was used. In 2020, 170 adolescents were recruited (T1). Of the total number of participants in 2021, 114 were included in the analysis for this paper (T2 and T3). 56 students did not participate in the study because they had completed compulsory education, did not enroll in further education and therefore their data could not be collected at the respective measurement points.

The objective was to conduct the study in a non-manipulated context. Prior to starting the intervention program, the students had experienced Direct Instruction and an exclusively teacher-directed grading system for teaching invasion games and sports. None of the students had previous experienced in developing active methodologies based on Self-Determination Theory before. Non-probability sampling was used.

Design and procedure

A high-dimensional one-group repeated-measures design, carried out in three moments over the course of a year. This study is part of a research project funded by the [anonymized].

The study was conducted in accordance with applicable ethical standards (Declaration of Helsinki, revised in 2013). It was initially approved as a research project by the research commission of [anonymized]; both the school and the parents/legal guardians of the students were informed and agreed to participate by providing their consent. Beforehand, the participants were informed that the data were confidential and anonymous and would only be used for research purposes.

Data were collected on three occasions: time 1 (T1, January 2020), initial assessment (pre-test); time 2 (T2, March 2020), post-test-1 at the end of intervention 1 (normal health status); and time 3 (T3, January 2021), post-test-2 at the end of intervention 2 (confinement) and 3 (new normal) (Table 1).

The BPN program

The program was based on the theory of basic psychological needs (Ryan & Deci, 2017) and the strategies suggested by Stangage and Ryan (2012): 1. Autonomy, maximizing opportunity for choice, acknowledging students′ feelings and minimizing ego involvement; 2. Competence, provision for optimal challenge, ample positive feedback and fostering of task involvement in activities; and 3. Relatedness, acknowledging students′ feelings and supporting an exercise buddy scheme. Within this theoretical construct, work environments were created that favored the satisfaction of basic psychological needs (Table 1). For example, autonomy, by using a methodology that gradually cedes decision-making and responsibility to students; competence, through the design of various, individual tasks which offer a personal challenge to each student and are evaluated using clear criteria that facilitate achievement and responsibility; and finally, relatedness, through group work and cooperative tasks in an emotionally supportive environment (Haerens et al., 2015; Vasconcellos et al., 2020).

Table 1.
Period, Type and Timing, Aims, Description, Places, and Strategies to support BPN Satisfaction

Program /Date	Health status	Type and timing	Autonomy	Competency	Relationship
Program 1 (Jan-Mar 2020)	Normality	Sports Orientation (14 sessions)	Students choose routes, reflect and self-evaluate their work.	Progression in map reading, solving different cooperative challenges and developing physical fitness in a playful way. Friendship Groups	Cooperative challenges and challenges.
Program 2	Confinement	Physical activity at	Participants choose the	Each student progressed by sending	The teachers provided positive

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

(Mar-Jun 2020)	period	home (online) (6 types of sessions)	teaching contents, evaluate their work and express their feelings through critical comments.	online feedback to their teacher and specialized in one teaching content.	feedback, encouragement, and concern for the emotional state of their students and family members.
Program 3 (Oct-Dec2020)	New normal	Physical Activity and Health in the Natural Environment (20 sessions)	Participants design their own routes outside the school and are involved in their own evaluation.	The participants transferred their learning in their free time: they provided evidence of their physical activity practice (km walked).	The structure of the session followed Pandemic protocols: no physical contact. Priority was given to the use of outdoor practices in small groups of friends.

The validity of the instruction and treatment was verified according to the recommendations of Hastie and Casey (2014). In the following section, *Intervention Program*, a detailed description of the periods, type and timing, aims, description, places, and additional details is provided. Reliability was evaluated through external observation by experts. The design was reviewed by two researchers specialized in the application of pedagogical models and during the implementation phase the research team met on-line on several occasions to give assessment and provide feedback.

Intervention programs

Program 1 (BPN in normal health situation)

To determine the effectiveness of the BPN-based intervention programs, data were collected before the program was implemented (T1) and once the program had concluded (T2). The first didactic unit aimed to understand and apply the fundamentals of orienteering sports to complete races in different environments: urban, semi-urban and natural. The structure of the orientation sessions was as follows: organization of materials (by the teacher and prior to each session: the placement of beacons in the field and preparation of maps graded by difficulty and control sheets), organization of groups (at first, small groups and finally, individual practice), distribution of materials (according to the objective of the session: map and / or compass), autonomous practice (with follow-up of the teacher to approve the good use of spaces and deal with any questions) and assessment of the session (number of controls found, fundamentally).

Program 2 (Health Status: confinement)

After the first data collection, a 2-month program of orienteering sports was developed. This was followed by a worldwide confinement period between March and June 2020. This first didactic unit aimed to promote the practice of physical activity at home, adjusted to the preferences of students and encouraging critical reflection and self-assessment. (1) PE teachers contacted the students through the school's official platform. The information was always preceded by learning the emotional state of the families and analyzing the difficulties they may have in accessing the Internet. (2) Motor tasks were grouped that could be performed at home in six thematic blocks: rhythmic activities (Latin, flamenco, zumba…), acrobatics (juggling, jump rope, gymnastics), dramatization (mime, theater, magic…), chain of challenges, conditioning of force (tabata, HIIT…) or travel routes with registration through mobile app. (3) Students chose the thematic block that appealed to them the most. To help ensure good performances, the teacher showed online tutorials and followed up on the tasks answering any questions posed. (4) A delivery date of a maximum of two weeks was set in which a self-assessment was requested with a rubric and personal reflection on the situation they lived at home.

During this period, the students had close contact with their PE teachers via digital media. Emotional monitoring of each family's situation was prioritized, health-related PE was oriented (development of autonomy both in the choice of the task and in its implementation).

Program 3 (Health Status: new normality)

Subsequently, from September to December 2021, students carried out their physical activities in a "new normal situation": activities were performed without sharing material (physical fitness and orienteering sport), without contact, with distancing and using a mask. The main objective of this stage was to learn and assess the possibilities of active displacement through the practice of hiking and orientation activities and participate in the planning and organization of adventure challenges. The structure of the session followed the pandemic protocols established by the center (hand sanitization, entrances and exits through designated areas and use of a mask) and families authorized the students to take part in outdoor activities. (1) The objective of the session was briefly explained and the group was moved to the practice area (bike lane, park, etc.). (2) The activity was carried out in small groups defined by the students. (3) Students carried out autonomous work (hiking or orientation) and without interaction between groups. (4) Each session was assessed by means of a rubric (participation, respect for road safety education rules and COVID-19rules). (5) Students returned to the school in designated areas and sanitized their hands. In the last sessions, the level of health (physical, social, emotional) was diagnosed and guidelines were given on active displacement using mobile apps. In the final classes the students designed distance, orientation and adventure routes.

The programs concluded with a final data collection session (T3) at the end of program 3 in January 2021.

Measurements

A closed-ended questionnaire based on a series of scales was used to assess the main objectives of the study. The

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

questionnaire was organized into different parts: (1) personal data (sex, age), (2) socio-demographic variables (occupational and professional level of parents), and (3) validated questionnaires used in the study:

Satisfaction of Basic Psychological Needs

The psychological need satisfaction and frustration scale was validated for the Spanish education context (Longo et al., 2018). It comprises 18 items, six for each psychological need (competence, relationship and autonomy). For each need, three items measure satisfaction and three measure frustration. In this study, the 9-item satisfaction subscale was used exclusively (e.g., "I feel I have the freedom to decide how to do things"). The items are preceded by the phrase: " In my job". Answers are rated on a response scale from 1 (strongly disagree) to 7 (strongly agree). Cronbach's alpha was .80.

Subjective well-being

The Life satisfaction scale in adolescents was used (Atienza et al., 2000), composed of five items, whose objective is to provide a general index of life satisfaction referring to the perception of subjective well-being (e.g., "I am satisfied with my life"). Each of the items were responded to by means of a Likert type scale with five alternatives, from 1 (totally disagree) to 5 (totally agree). Cronbach's alpha was .76.

Intention to engage in physical activity in the future

The Spanish version of the Intention to be Physically Active Scale (IPAS) (Hein et al., 2004) was used (Moreno et al., 2007). It consists of five items to measure a person's intention to be physically active (e.g., "After I finish high school, I would like to be physically active"). The items are preceded by the sentence: "Regarding your intention to do some physical-sports activity". The answers correspond to a Likert-type scale that ranges from 1 (totally disagree) to 5 (totally agree). In the present study, Cronbach's alpha of this scale was .89.

Data analysis

Normality, skewness tests and kurtosis were used to assess normal distribution. All variables did not show a normal distribution. However, the analysis of variance (ANOVA) is considered a valid statistical procedure under non-normality conditions when skewness and kurtosis range between -1 and 1 (Blanca et al., 2017), and these were: between-.254 and-.979; and between -.790 and .982.

Subsequently, descriptive statistics—i.e., means (M) and standard deviation (SD)—and bivariate correlations between the study variables, through Pearson's correlation coefficient, were calculated.

Secondly, to assess the impact of the program, repeated measures t-test analyses were performed. Thirdly, to determine the differences between sexes, an analysis of variance (ANOVA) with repeated measures (T1, T2, T3) was carried out, taking the sex variable (male and female) as a factor.

Analyses were performed using the SPSS software for Windows V.20.0, and the significance level was set at p value<.05. The analyses were performed separately by sex.

Results

Inference Results

The descriptive statistics (i.e., M and SD) and the differences in the T1, T2 and T3 measurements (M, SD and p) are reflected in Table 2. The results showed a significant increase in the need for autonomy after the first intervention (T2, Without COVID-19) and how this improvement was maintained in the subsequent programs (T3, With COVID-19). No significant differences were found in the rest of the variables analyzed in the measurements after the intervention (T2 and T3) with respect to the initial values (T1).In the comparative analysis between the programs that followed the self-determination theory (SDT), in the absence of Pandemic (T2) and in the COVID-19 situation (T3), no significant differences were found in the variables analyzed (all p>.05) except for the intention to be physically active in which the values decreased (p=.014) in the COVID-19 situation (T3).

Table 2.
Descriptive Statistics and Differences for each Dependent Variable at the Beginning and End of the SDT-Program

	Descriptive						Differences								
	T1		T2		T3		T2-T1			T3-T1			T3-T2		
	M	SD	M	SD	M	SD	M	SD	p	M	SD	p	M	SD	p
Int.physically active	3.72	1.04	3.82	1.02	3.64	1.04	.09	.70	.143	-.07	.61	.189	-.17	.72	.014
Need Autonomy	5.16	1.41	5.53	1.22	5.41	1.16	.37	1.39	.006	.25	1.12	.019	-.12	.16	.277
Need relatedness	5.80	.88	5.78	1.15	5.79	.95	-.02	1.04	.809	-.01	1.03	1	0.01	1.14	.934
Need competence	5.07	1.07	5.20	1.09	5.11	1.06	.13	1	.163	.04	1.08	.796	-.09	.93	.283
Satisfaction with life	3.95	.70	4.00	.63	3.93	.66	.05	.62	.364	-.27	.67	.675	-.08	.64	.184

Note: T1= pre intervention 1; T2= post intervention 1; T3= post intervention 2 and 3; M: Mean; SD: standard deviation; p< .05.

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

Table 3.
Results of the Multivariate Analysis of Variance

	Covariate: Sex			
	Λ	F	p	P
Intention of being physically active	.981	1.32	.51	.10
Need Autonomy	.999	.106	.746	.06
Need relatedness	.981	.57	.45	57
Need competence	.988	.16	.69	.07
Satisfaction with life	.989	.42	.78	.06

Note: Λ = Lambda de Wilks; P = power; p< .05.

The ANOVA results did not show statistically significant differences between sex (male, female) after the interventions performed (T2, T3) (all p>.05) (Table3).

Correlations among variables

As can be appreciated in Table 4, the three basic psychological needs correlated positively with each other and these in turn with life satisfaction (p<.05). No clear results were obtained between interest in being physically active and the rest of the psychological variables analyzed. Positive correlations were found between interest in being physically active and the needs for relationships and competition. However, these results were not found in the three measurements taken.

Table 4.
Correlations among Study Variables

	1	2	3	4	5
1.Int. of being physically active					
T1	-	-.08	.17	.37**	-.08
T2	-	.07	.21*	.23*	.18
T3	-	-.12	.-.04	.17	.06
2. Need Autonomy					
T1	-.09	-	.32**	.23*	.27**
T2	.07	-	.52**	.36**	.36**
T3	-.12	-	.31**	.38**	.22*
3. Need relatedness					
T1	.17	.32**	-	.35**	.43**
T2	.21*	.52**	-	.33**	.43**
T3	-.4	.31**	-	.35**	.49**
4. Need competence					
T1	.37**	.23*	.35**	-	.25**
T2	.23*	.36**	.33**	-	.35**
T3	.17	.38**	.35**	-	.26**
5. Satisfaction with life					
T1	-.08	.27**	.43**	.25**	-
T2	.19*	.36**	.43**	.35**	-
T3	.06	.22*	.49**	.26**	-

*T1= pre-test, T2=post-test 1 (without COVID-19), T3= post-test 2 (with COVID-19); sig.: *p<.05, **p<.01

Discussion

The principal objective of this study was to analyze the effect of a PE program based on SDT, for a period of one year during the COVID-19 pandemic, on the satisfaction of BPN, life satisfaction and the intention to be physically active.

Regarding the principal objective, it should be noted that, despite the increase in physical inactivity caused by COVID-19 (Dunton et al., 2020) and the grave psychological and social consequences it has brought about (Xiang et al., 2020), from the current findings it could be considered that the intervention program based on SDT has successfully maintained the motivational level of students, their interest in being physically active and degree of life satisfaction. Furthermore, there was a significant improvement in the variable need for autonomy. These results are highly significant considering the difficulty posed by carrying out any intervention in PE during the COVID-19 period. The findings coincide with the results of other studies which identified the benefits, after an intervention based on BPN, in the satisfaction of autonomy among students (Amado et al., 2014; Cheon et al., 2012; Franco et al., 2017; González-Cutre et al., 2014).

After the intervention, no significant changes were found in the need for competence, relatedness or the intention to be physically active and life satisfaction. Although interventions are aimed at achieving improvements, the grave situation caused by COVID-19 has had a notable impact on physical inactivity, obstructing social relations and causing significant psychosocial harm (Dunton et al., 2020; Xiang et al., 2020). With this in mind, maintaining the initial levels for these variables can be considered a relative achievement. Regarding the need for competence, it should be noted that even in a normal context, the levels saw no improvement after a short intervention program, as indicated in the study by Amado et al. (2014), although there are cases where improvements were achieved (Franco et al., 2017). For the need for relatedness, many studies prior to the pandemic achieved improvements (Amado et al., 2014; Cheon et al., 2012; Shen et al., 2009) while others saw no variation in reported levels (Franco et al., 2017). The same situation is found for the intention to be physically active. Similar projects also failed to achieve any improvement under normal circumstances (Franco et al., 2017), while others saw an increase in extracurricular physical activity (PA) (González-Cutre et al., 2014). Regarding life satisfaction, previous studies have confirmed the association between satisfaction of BPN and participation in physical activities (Leversen et al., 2012), and thus the results are in line with the data obtained from the other variables of the present study. Curiously, there was an increase in the need for autonomy but not in life satisfaction when other studies have confirmed the positive influence of one variable on the other (Leversen et al., 2012). One possible explanation for this anomaly may be the effect of the pandemic and its grave impact on psychosocial wellbeing (Xiang et al., 2020) and, at the same time, the change in the methodology to promote student autonomy (Pelikan et al., 2021).

Regarding the decrease in intention to be physically active, the results of our study are unsettling, as all three basic psychological needs were met throughout the intervention process and therefore they would be expected to promote optimal motivation for positive behavioral intentions to be physically active (Deci & Ryan, 2000). Cid et al. (2019) observed that competence satisfaction and autonomous motivation positively affects the intention to practice sport and physical activity. Also found to be important was a motivational climate oriented for learning for the positive impact

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

on students' satisfaction BPN. Likewise, a study in UK university students found that nine months after the onset of the pandemic mental health and movement behaviors were affected by a decrease in well-being and physical activity (Savage et al., 2021). These authors relate the results to increased perceived stress and increased sedentary behavior. The prolonged restrictions experienced in the pandemic period may have been key in influencing the mood and lifestyle of the students, leading to less interest in being physically active. This would explain the results found in the post COVID-19intervention (T3). Regarding the correlations, it can be said that there was a correlation between the three basic psychological needs (competence, autonomy and relatedness). Our study concurs with other authors such as Kang et al. (2020), who, when examining adherence to physical exercise also using self-determination theory and the sport commitment model, found that basic psychological needs have significant predictive power for adherence to physical exercise. This means that the NPB play a key role in predicting adherence to physical exercise. In this way, the development of physical activity is not only related to enjoyment and competition, but also the need for autonomy, competence and relationship help to maintain a high level of motivation towards carrying out physical exercise.

Regarding the differences according to gender, the study managed to palliate the initial differences in the need for relatedness and the intention to be physically active. Initial results were similar to those of previous studies, showing a higher satisfaction of NBP among boys versus girls (Brunet & Sabiston, 2009) and a significantly higher interest in carrying out physical activity (Nader, 2008) more actively and frequently among adolescent boys (Guo & Liang, 2023). However, after the intervention this gender difference was found to be absent. Perhaps this could be related to resilience, that is, after living such a complicated period underCOVID-19, students needed that ability to adapt and recover psychologically from adversities and changes occurred. In the study of Guo & Liang (2023), no gender difference with respect to the resilience of the levels of participation in physical activity was found. This is a very important point in terms of the aim to promote equitable participation in physical activity. These results may also be due to greater degrees of autonomy, which some researchers maintain is a powerful measure of BPN in PE (Claver et al., 2020). In fact, a recent study of Spanish students with special educational needs showed how support for individual autonomy improved the levels of physical activity during school recess (Huéscar et al., 2020). Furthermore, the absence of differences in T2 in the need for relatedness may be due to the fact that, in order to adapt to the circumstances of the pandemic, PE requires distancing among students. This created an ideal scenario to eliminate physical contact and improve safety, regarded as key factors in encouraging the practice of PA among girls (Nader, 2008).

Finally, no sex differences were found in the variables analyzed in this study. This data is of great interest as it reveals that despite the demonstrated differences in BPN satisfaction (Lamoneda & Huertas, 2019) and physical activity levels (Guo & Liang, 2023) between males and females, the SDT-based intervention program in both normal and pandemic health situations helped both boys and girls to fully integrate into the PE class. Consequently, the created SDT-based learning environment succeeded in maintaining participants' motivational levels and improved autonomy regardless of gender. These results are consistent with previous research on SDT conducted in the context of PE in which they highlighted the importance of PE teachers providing a motivational style based on needs-supportive behaviors for students to have positive motivational experiences in their PE classes regardless of gender (Burgueño et al., 2022). As practical implications, the enhancement of autonomy and the bridging of gender gaps in motivation and participation within PE programs, as demonstrated by our study, suggest practical steps for adapting PE curricula to support students' well-being during crises like the COVID-19 pandemic. By integrating strategies from Self-Determination Theory (SDT), educators can foster a more inclusive environment that caters to the psychological and physical needs of all students. Aligning with the insights of Santurio and Fernández-Río (2017), our findings emphasize the significance of addressing basic psychological needs (BPN) in fostering a lifelong engagement with physical activity. This not only aids in sustaining interest and satisfaction in being physically active among adolescents but also highlights the essential role of PE in promoting equitable participation and enhancing life satisfaction across genders.

Conclusions

The PE intervention program based on SDT during the COVID-19 pandemic not only successfully maintained the motivational levels of competence and relatedness in PE, but also improved the satisfaction of autonomy: the interest in being physically active and degree of life satisfaction were also maintained and also showed that boys and girls felt fully integrated in the PE class.

The principal limitations of the study are the absence of a control group which could offer a comparison of the results of different types of interventions; the impossibility of monitoring students during such as long period of time (one year) and the time dedicated to PE, limited to two hours per week.

Future lines of research should consider the possibility of applying a PE intervention program based on SDT in comparison with other types of methodologies.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Ajzen, I. (1991). The theory of planned behavior. Organizational

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

Behavior and Human Decision Processes, 50, 179–211. https://doi.org/10.1080/10410236.2018.1493416

Amado, D., Del Villar, F., Leo, F. M., Sánchez-Oliva, D., Sánchez-Miguel, P. A., & García-Calvo, T. (2014). Effect of a multi-dimensional intervention programme on the motivation of physical education students. PLoS ONE, 9(1), e85275. https://doi.org/10.1371/journal.pone.0085275

Atienza, F. L., Pons, D., Isabel Balaguer, & García-Merita, M. (2000). Propiedades psicométricas de la escala de satisfacción con la vida en adolescentes. Psicothema, 12(2), 314–319.

Babic, M. J., Morgan, P. J., Plotnikoff, R. C., Lonsdale, C., White, R. L., & Lubans, D. R. (2014). Physical activity and physical self-concept in youth: Systematic review and meta-analysis. Sports Medicine, 44(11), 1589–1601. https://doi.org/10.1007/s40279-014-0229-z

Bartholomew, K. J., Ntoumanis, N., Mouratidis, A., Katartzi, E., Thøgersen-Ntoumani, C., &Vlachopoulos, S. (2018). Beware of your teaching style: A school-yearlong investigation of controlling teaching and student motivational experiences. Learning and Instruction, 53, 50–63. https://doi.org/10.1016/j.learninstruc.2017.07.006

Blanca, M. J., Alarcón, R., & Arnau, J. (2017). Non-normal data: Is ANOVA still a valid option? Psicothema, 29(4), 552–557. https://doi.org/10.7334/psicothema2016.383

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. The Lancet, 395(10227), 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Brunet, J., & Sabiston, C. M. (2009). Social physique anxiety and physical activity: A self-determination theory perspective. Psychology of Sport and Exercise, 10(3), 329–335. https://doi.org/10.1016/j.psychsport.2008.11.002

Burgueño, R., García-González, L., Abós, A. & Sevil, J. (2022). Students' motivational experiences across profiles of perceived need-supportive and need-thwarting teaching behaviors in physical education. Physical Education and Sport Pedagogy. https://doi.org/10.1080/17408989.2022.2028757

Cheon, S. H., Reeve, J., & Moon, I. S. (2012). Experimentally based, longitudinally designed, teacher-focused intervention to help physical education teachers be more autonomy supportive toward their students. Journal of Sport and Exercise Psychology, 34(3), 365–396. https://doi.org/10.1123/jsep.34.3.365

Cid, L., Pires, A., Borrego, C., Duarte-Mendes, P., Teixeira, D. S., Moutão, J. M., & Monteiro, D. (2019). Motivational determinants of physical education grades and the intention to practice sport in the future. PLoS ONE, 14(5), e0217218. https://doi.org/10.1371/journal.pone.0217218

Claver, F., Martínez-Aranda, L. M., Conejero, M., & Gil-Arias, A. (2020). Motivation, discipline, and academic performance in physical education: A holistic approach from achievement goal and self-determination theories. Frontiers in Psychology, 11, 1808. https://doi.org/10.3389/fpsyg.2020.01808

De Looze, M., Elgar, F. J., Currie, C., Kolip, P., & Stevens, G. W. J. M. (2019). Gender inequality and sex differences in physical fighting, physical activity, and injury among adolescents across 36 countries. Journal of Adolescent Health, 64(5), 657–663. https://doi.org/10.1016/j.jadohealth.2018.11.007

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-determination theory in work organizations: The state of a science. Annual Review of Organizational Psychology and Organizational Behavior, 4(1), 19–43. https://doi.org/10.1146/annurev-orgpsych-032516-113108

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Deci, E. L., & Ryan, R. M. (2004). Handbook of self-determination research (Softcover edition). University of Rochester Press.

Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: An introduction. Journal of Happiness Studies, 9(1), 1–11. https://doi.org/10.1007/s10902-006-9018-1

Deci, E. L., & Ryan, R. M. (2016). Optimizing students' motivation in the era of testing and pressure: A self-determination theory perspective. In W. C. Liu, J. C. K. Wang, & R. M. Ryan (Eds.), Building Autonomous Learners (pp. 9–29). Springer Singapore.

Doshybekov, A., Absatova, M., Yerzhigit, K., Yermakhanov, B., Galymzhan, K., & Çar, B. (2024). Construir a los campeones del mañana: Una visión de la educación olímpica en la escuela a través de la prospectiva virtual y la elaboración de perfiles de aptitud física específicos para cada deporte (Building tomorrow's champions: A vision for olympic education at the school level through virtual foresight and sport-specific fitness profiling). Retos, 54, 46-56.https://doi.org/10.47197/retos.v54.103536

Dunton, G. F., Do, B., & Wang, S. D. (2020). Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the U.S. BMC Public Health, 20(1), 1351. https://doi.org/10.1186/s12889-020-09429-3

Franco, E., Coterón, J., & Gómez, V. (2017). Promoción de la actividad física en adolescentes: Rol de la motivación y autoestima. PSIENCIA. Revista Latinoamericana de Ciencia Psicológica, 9(2), 1–15. https://doi.org/10.5872/psiencia/9.2.24

García-Pérez, A., Ramírez-Arrabal, V., Rojas-Cepero, I., & Caracuel-Cáliz, R. F. (2024). El alumnado de educación primaria promotor de salud a través de la investigación en el área de educación física (Primary school students promoting health through research in the area of physical education). Retos, 55, 327-338.https://doi.org/10.47197/retos.v55.101545

González-Cutre, D., Ferriz, R., Beltrán-Carrillo, V. J., Andrés-Fabra, J. A., Montero-Carretero, C., Cervelló, E., & Moreno-Murcia, J. A. (2014). Promotion of autonomy for participation in physical activity: A study based on the trans-contextual model of motivation. Educational Psychology, 34(3), 367–384. https://doi.org/10.1080/01443410.2013.817325

Guo, L., & Liang, L. (2023). Physical activity as a causal variable for adolescent resilience levels: A cross-lagged analysis. Frontiers in Psychology, 14, 1095999. https://doi.org/10.3389/fpsyg.2023.1095999

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: A pooled analysis of 298 population-based surveys with 1·6 million participants. The Lancet Child & Adolescent Health, 4(1), 23–35. https://doi.org/10.1016/S2352-4642(19)30323-2

Haerens, L., Aelterman, N., Vansteenkiste, M., Soenens, B., & Van Petegem, S. (2015). Do perceived autonomy-supportive

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. Psychology of Sport and Exercise, 16, 26–36. https://doi.org/10.1016/j.psychsport.2014.08.013

Hastie, P. A., & Casey, A. (2014). Fidelity in models-based practice research in sport pedagogy: A guide for future investigations. Journal of Teaching in Physical Education, 33(3), 422–431. https://doi.org/10.1123/jtpe.2013-0141

Hein, V., Müür, M., & Koka, A. (2004). Intention to be physically active after school graduation and Its relationship to three types of intrinsic motivation. European Physical Education Review, 10(1), 5–19. https://doi.org/10.1177/1356336X04040618

Huéscar, E., Moreno-Murcia, J. A., Domenech, J. F., & Núñez, J. L. (2020). Effects of an autonomy-supportive physical activity program for compensatory care students during recess time. Frontiers in Psychology, 10, 3091. https://doi.org/10.3389/fpsyg.2019.03091

Hossain, M. M., Tasnim, S., Sultana, A., Faizah, F., Mazumder, H., Zou, L., McKyer, E. L. J., Ahmed, H. U., & Ma, P. (2020). Epidemiology of mental health problems in COVID-19: A review. F1000Research, 9, 636. https://doi.org/10.12688/f1000research.24457.1

Krause, A. E., North, A. C., & Davidson, J. W. (2019). Using self-determination theory to examine musical participation and well-being. Frontiers in Psychology, 10, 405. https://doi.org/10.3389/fpsyg.2019.00405

Kang, S., Lee, K., & Kwon, S. (2020). Basic psychological needs, exercise intention and sport commitment as predictors of recreational sport participants' exercise adherence. Psychology &Health, 35(8), 916-932.https://doi.org/10.1080/08870446.2019.1699089

Lamoneda, J., & Huertas, J. (2019). Necesidades psicológicas básicas, organización deportiva y niveles de actividad física en escolares. Revista de Psicología del Deporte, 28(1), 115–124.

Leversen, I., Danielsen, A. G., Birkeland, M. S., &Samdal, O. (2012). Basic psychological need satisfaction in leisure activities and adolescents' life satisfaction. Journal of Youth and Adolescence, 41(12), 1588–1599. https://doi.org/10.1007/s10964-012-9776-5

Longo, Y., Alcaraz-Ibáñez, M., & Sicilia, A. (2018). Evidence supporting need satisfaction and frustration as two distinguishable constructs. Psicothema, 30(1), 74–81. https://doi.org/10.7334/psicothema2016.367

Martín-Albo, J., Núñez, J. L., Navarro, G., &Grijalvo, F. (2009). Un modelo motivacional explicativo del bienestar psicológico en la universidad. Revista Mexicana de Psicología, 26(1), 41–50.

McDavid, L., McDonough, M. H., Blankenship, B. T., & LeBreton, J. M. (2017). A test of basic psychological needs theory in a physical-activity-based program for underserved youth. Journal of Sport and Exercise Psychology, 39(1), 29–42. https://doi.org/10.1123/jsep.2016-0038

Mercier, K., Centeio, E., Garn, A., Erwin, H., Marttinen, R., & Foley, J. (2021). Physical education teachers' experiences with remote instruction during the initial phase of the COVID-19 pandemic. Journal of Teaching in Physical Education, 40(2), 337–342. https://doi.org/10.1123/jtpe.2020-0272

Moreno, J. A., Moreno, R., & Cervelló, E. (2007). El autoconcepto físico como predictor de la intención de ser físicamente activo. Psicología y Salud, 17(2), 261–267.

Morillo-Baro, J. P., Reigal Garrido, R. E., & Hernández-Mendo, A. (2018). Motivational orientation, autonomy support and psychological needs in beach handball. Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte, 18(69), 103-117. https://doi.org/10.15366/rimcafd2018.69.007

Nader, P. R. (2008). Moderate-to-vigorous physical activity from ages 9 to 15 years. JAMA, 300(3), 295. https://doi.org/10.1001/jama.300.3.295

Nicholls, J. G. (1989). The competitive ethos and democratic education. Harvard University Press.

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. Theory and Research in Education, 7(2), 133–144. https://doi.org/10.1177/1477878509104318

Ntoumanis, N., & Standage, M. (2009). Motivation in physical education classes: A self-determination theory perspective. Theory and Research in Education, 7(2), 194–202. https://doi.org/10.1177/1477878509104324

Ntoumanis, N., Ng, J. Y., Prestwich, A., Quested, E., Hancox, J. E., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Lonsdale, C., & Williams, G. (2021). A meta-analysis of self-determination theory-informed intervention studies in the health domain: Effects on motivation, health behavior, physical, and psychological health. Health psychology review, 15(2), 214-244.https://doi.org/10.1080/17437199.2020.1718529

Pelikan, E. R., Lüftenegger, M., Holzer, J., Korlat, S., Spiel, C., & Schober, B. (2021). Learning during COVID-19: The role of self-regulated learning, motivation, and procrastination for perceived competence. Zeitschrift Für Erziehungswissenschaft, 24(2), 393–418. https://doi.org/10.1007/s11618-021-01002-x

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. Guilford Press.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology, 61, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Savage, M. J., Hennis, P. J., Magistro, D., Donaldson, J., Healy, L. C., & James, R. M. (2021). Nine months into the COVID-19 pandemic: A Longitudinal study showing mental health and movement behaviours are impaired in UK students. International Journal of Environmental Research and Public Health, 18(6), 2930. https://doi.org/10.3390/ijerph18062930

Shen, B., McCaughtry, N., Martin, J., & Fahlman, M. (2009). Effects of teacher autonomy support and students' autonomous motivation on learning in physical education. Research Quarterly for Exercise and Sport, 80(1), 44–53. https://doi.org/10.1080/02701367.2009.10599528

Standage, M., & Ryan, R. M. (2012). Self-determination theory and exercise motivation: Facilitating self-regulatory processes to support and maintain health and well-being. In G. C. Roberts & D. C. Treasure (Eds.), Advances in Motivation in Sport and Exercise (3ª, pp. 233–270). Human Kinetics.

Santurio, J. I. M., & Fernández-Río, J. (2017). Responsabilidad social, necesidades psicológicas básicas, motivación intrínseca y metas de amistad en educación física. Retos, 32, 134-139. https://doi.org/10.47197/retos.v0i32.52385

© Copyright: Federación Española de Asociaciones de Docentes de Educación Física (FEADEF) ISSN: Edición impresa: 1579-1726. Edición Web: 1988-2041 (https://recyt.fecyt.es/index.php/retos/index)

Tao, K., Liu, W., Xiong, S., Ken, L., Zeng, N., Peng, Q., Yan, X., Wang, J., Wu, Y., Lei, M., Li, X., & Gao, Z. (2019). Associations between self-determined motivation, accelerometer-determined physical activity, and quality of life in Chinese college students. International Journal of Environmental Research and Public Health, 16(16), 2941. https://doi.org/10.3390/ijerph16162941

Taylor, I. M., & Lonsdale, C. (2010). Cultural differences in the relationships among autonomy support, psychological need satisfaction, subjective vitality, and effort in British and Chinese physical education. Journal of Sport and Exercise Psychology, 32(5), 655–673. https://doi.org/10.1123/jsep.32.5.655

Trigueros, R., Aguilar-Parra, J. M., Cangas, A. J., López-Liria, R., & Álvarez, J. F. (2019). Influence of physical education teachers on motivation, embarrassment and the intention of being physically active during adolescence. International Journal of Environmental Research and Public Health, 16(13), 2295. https://doi.org/10.3390/ijerph16132295

Trigueros, R., Mínguez, L. A., González-Bernal, J. J., Jahouh, M., Soto-Camara, R., & Aguilar-Parra, J. M. (2019). Influence of teaching style on physical education adolescents' motivation and health-related lifestyle. Nutrients, 11(11), 2594. https://doi.org/10.3390/nu11112594

Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic psychological need theory: Advancements, critical themes, and future directions. Motivation and emotion, 44(1), 1-31. https://doi.org/10.1007/s11031-019-09818-1

Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N., Lee, J., Antczak, D., Ntoumanis, N., Ryan, R. M., & Lonsdale, C. (2020). Self-determination theory applied to physical education: A systematic review and meta-analysis. Journal of Educational Psychology, 112(7), 1444–1469. https://doi.org/10.1037/edu0000420

Vlachopoulos, S. P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The basic psychological needs in exercise scale. Measurement in Physical Education and Exercise Science, 10(3), 179–201. https://doi.org/10.1207/s15327841mpee1003_4

Webster, C. A., D'Agostino, E., Urtel, M., McMullen, J., Culp, B., EganLoiacono, C. A., & Killian, C. (2021). Physical education in the COVID era: Considerations for online program delivery using the comprehensive school physical activity program framework. Journal of Teaching in Physical Education, 40(2), 327–336. https://doi.org/10.1123/jtpe.2020-0182

Wolf, S., Seiffer, B., Zeibig, J. M., Welkerling, J., Brokmeier, L., Atrott, B., Ehring, T., & Schuch, F. B. (2021). Is physical activity associated with less depression and anxiety during the COVID-19 pandemic? A rapid systematic review. Sports Medicine, 51(8), 1771-1783. https://doi.org/10.1007/s40279-021-01468-z

Xiang, M., Zhang, Z., & Kuwahara, K. (2020). Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. Progress in Cardiovascular Diseases, 63(4), 531–532. https://doi.org/10.1016/j.pcad.2020.04.013

Yli-Piipari, S., Watt, A., Jaakkola, T., Liukkonen, J., & Nurmi, J.-E. (2009). Relationships between physical education students' motivational profiles, enjoyment, state anxiety, and self-reported physical activity. Journal of Sports Science & Medicine, 8(3), 327–336.

Datos de los/as autores/as y traductor/a:

Javier Lamoneda Prieto	educacionfisicajlp@gmail.com	Autor/a
Michelle Matos Duarte	michelle.matos@ufv.es	Autor/a
Eulisis Smith Palacio	e.smith@ufv.es	Autor/a
Juan Fraile	juan.fraile@ufv.es	Autor/a
Martin Carpio García	info@centre-point.org	Traductor/a