



## Basic psychological needs in Physical Education in secondary education: a systematic review

*Necesidades psicológicas básicas en la Educación Física en educación secundaria: una revisión sistemática*

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### Abstract

**Introduction:** Physical Education in Compulsory Secondary Education plays an important role not only in the development of motor skills but also in students' psychological and social growth. From the perspective of Self-Determination Theory, the satisfaction of basic psychological needs is considered a key factor in promoting motivation and well-being.

**Objective:** The aim of this systematic review was to identify studies focused on the satisfaction of basic psychological needs—autonomy, competence, and relatedness—in Physical Education within Compulsory Secondary Education, as well as to analyse pedagogical interventions designed to promote them.

**Methodology:** A systematic review was conducted following PRISMA guidelines. The literature search was carried out in the ERIC, PubMed, Scopus, Web of Science, and PsycINFO databases, applying predefined inclusion and exclusion criteria. Eighteen studies met the established criteria and were included in the final analysis.

**Results:** The findings show that innovative pedagogical approaches, such as the Sport Education Model, Gamification, and the Personal and Social Responsibility Model, positively influence the satisfaction of basic psychological needs. These approaches were associated with higher levels of motivation, engagement, and holistic student development, whereas traditional teaching methods showed limited effects. Likewise, positive relationships appear between structured physical activities and psychological wellbeing, with substantial improvements in basic psychological needs.

**Discussion:** The findings highlight the importance of autonomy-supportive motivational climates in improving students' experiences in Physical Education.

**Conclusions:** It is concluded that participation in Physical Education alone does not guarantee student well-being. The implementation of active teaching methodologies combined with a supportive instructional climate is essential for satisfying basic psychological needs and enhancing students' motivation and personal development.

### Keywords

Educational innovations; adolescence; well-being; motivation; Physical Education.

### Resumen

**Introducción:** La Educación Física en la Educación Secundaria Obligatoria desempeña un papel relevante no solo en el desarrollo de habilidades motrices, sino también en el crecimiento psicológico y social del alumnado. Desde la Teoría de la Autodeterminación, la satisfacción de las necesidades psicológicas básicas se considera un elemento clave para favorecer la motivación y el bienestar.

**Objetivo:** El objetivo de esta revisión sistemática fue identificar estudios centrados en la satisfacción de las necesidades psicológicas básicas —autonomía, competencia y relación— en la Educación Física de la Educación Secundaria Obligatoria, así como analizar las intervenciones pedagógicas orientadas a su promoción.

**Metodología:** Se llevó a cabo una revisión sistemática siguiendo las directrices PRISMA. La búsqueda bibliográfica se realizó en las bases de datos ERIC, PubMed, Scopus, Web of Science y PsycINFO, aplicando criterios de inclusión y exclusión previamente definidos. Finalmente, se seleccionaron dieciocho estudios que cumplieron con los requisitos establecidos.

**Resultados:** Los resultados muestran que metodologías pedagógicas innovadoras, como el Modelo de Educación Deportiva, la Gamificación y el Modelo de Responsabilidad Personal y Social, influyen positivamente en la satisfacción de las necesidades psicológicas básicas. Estas propuestas se asociaron con mayores niveles de motivación, implicación y desarrollo integral del alumnado, mientras que los enfoques tradicionales presentaron efectos limitados. Del mismo modo, se observan relaciones positivas entre las actividades físicas estructuradas y el bienestar psicológico, con mejoras sustanciales en las necesidades psicológicas básicas.

**Discusión:** Los hallazgos destacan la importancia de climas motivacionales que apoyen la autonomía para mejorar la experiencia del alumnado en Educación Física.

**Conclusiones:** Se concluye que la participación en Educación Física no garantiza por sí sola el bienestar del alumnado. La aplicación de metodologías activas junto a un clima docente de apoyo resulta fundamental para satisfacer las necesidades psicológicas básicas y potenciar la motivación y el desarrollo personal.

### Palabras clave

Innovación educativa; adolescencia; bienestar; motivación; Educación Física.



## Introduction

Currently, Physical Education (PE) is not only oriented towards physical and motor development but also plays a key role in pupils' psychological and social development (Rodríguez et al., 2016; Pérez & Albarrán, 2023). Numerous studies have shown that participation in physical and sporting activities fosters healthy lifestyles, promotes mental health, strengthens interpersonal relationships, and enhances essential emotional competences—particularly in adolescence, a stage characterised by profound changes and challenges (Hernández & Estero, 2021; Osorio & Rivero, 2021; Castillo et al., 2007).

Within this framework, Self-Determination Theory (SDT) stands as a fundamental reference for understanding human motivation and behaviour (Deci & Ryan, 1985, 2000). One of its derivations, Basic Psychological Needs Theory (BPNT) (Deci & Ryan, 2000, 2002), posits that psychological well-being, intrinsic motivation, and optimal human development depend on the satisfaction of three universal and innate needs: autonomy (a sense of volition over one's actions), competence (feeling capable and effective when facing environmental challenges), and relatedness (connection and belonging within the social group). Their satisfaction is linked to higher motivation and well-being, which is essential in educational settings to increase pupils' engagement and foster active, healthy lifestyles (Cajilema & León, 2023).

PE constitutes a privileged context in which to address these needs, as their satisfaction helps generate a positive attitude and greater motivation and involvement in physical activity (Serrano et al., 2016). Indeed, previous research shows that students feel more motivated and satisfied when their Basic Psychological Needs (BPN) are supported, whereas their frustration can lead to amotivation and withdrawal from physical-sport practice (Cuevas et al., 2018; González-Cutre et al., 2018). Thus, motivation is recognised as a decisive factor for academic performance, self-esteem, and the adoption of a physically active lifestyle (Torres et al., 2015), while amotivation is associated with apathy, low achievement, and negative consequences for emotional well-being.

Against this backdrop, there has been a drive to incorporate active and innovative methodologies in contemporary PE, such as Gamification, Cooperative Learning, the Sport Education Model (SEM), hybrid models, and the integration of ICT (Fernández-Río et al., 2020; Díaz et al., 2020). These approaches seek to foster motivation, enjoyment, and the adaptation of teaching to pupils' needs and interests, while also contributing to the satisfaction of BPN (Silvia & Prieto, 2021; Fernández-Río & Méndez-Giménez, 2016). However, their effectiveness depends on contextual and social factors such as gender, motivational climate, socio-economic status, and the teacher's role (Granero-Gallegos & Gómez-López, 2020; Trigueros-Ramos et al., 2019). Consequently, it is essential to create inclusive, tailored environments that guarantee equitable participation for all pupils (Garaizabal-Buldain & González-Palomares, 2020; Hervada et al., 2022).

In this vein, several studies have evidenced the positive effects of specific interventions. For example, Cuevas et al. (2015) implemented an SEM-based programme with 86 students and found a significant improvement in the satisfaction of competence compared with a traditional model. Similarly, Gómez-López et al. (2021), with a sample of 464 students, reported that the satisfaction of all three BPN—especially relatedness—was associated with less fear of failure. Moreover, pupils engaged in extra-curricular physical-sport practice reported higher levels of autonomy, competence, and social connection, reinforcing the importance of accumulated motor experience. In addition, Andreo et al. (2021), in a study with 97 adolescents, identified a positive correlation between the satisfaction of competence and relatedness and certain implicit beliefs about ability that value effort as a route to improvement.

Nonetheless, BPN are not always satisfied. Leao-Pereira & Lorente-Catalán (2024) showed that secondary pupils—especially girls—exhibit lower satisfaction of autonomy and competence compared with primary pupils, reflecting limitations in the effectiveness of some strategies for creating inclusive environments. These findings underscore the need for adapted interventions that respond to learner diversity (Garaizabal-Buldain & González-Palomares, 2020; Hervada et al., 2022). In the same direction, the frustration of BPN may engender shame, fear of failure, or task avoidance—particularly among students with low motor competence—negatively affecting their motivation and emotional well-being (Gómez-López et al., 2021).



In this context, the purpose of this review is to identify and examine existing studies that analyse the satisfaction of BPN among compulsory secondary school pupils in the area of PE, as well as to review the characteristics and outcomes of interventions aimed at promoting them. In so doing, the review seeks to provide evidence that contributes to optimising pupils' psychosocial well-being and improving the quality of teaching in this field.

## Method

### ***Protocol and reporting***

This systematic review aimed to identify and analyse studies examining the satisfaction of BPN among compulsory secondary-school pupils in PE. The review followed the PRISMA 2020 Statement (Page et al., 2021) and the practical guidance for systematic reviews with and without meta-analysis (Moher et al., 2015). The PICO framework (Costa et al., 2007) was used to operationalise the eligibility criteria. Procedures were specified a priori, and the review was registered with PROSPERO (International Prospective Register of Systematic Reviews) under the identifier CRD420251089166, accessible at <https://www.crd.york.ac.uk/PROSPERO/view/CRD420251089166>.

### ***Eligibility criteria***

Studies were included when they met all of the following: (a) full-text available; (b) written in English, Spanish, or Portuguese; (c) empirical research focused on BPN within the PE context; (d) conducted with secondary-school pupils; and (e) published within the last five years to ensure recency and completeness. Reference lists of eligible papers were hand-searched to identify additional studies meeting these criteria.

### ***Information sources and search strategy***

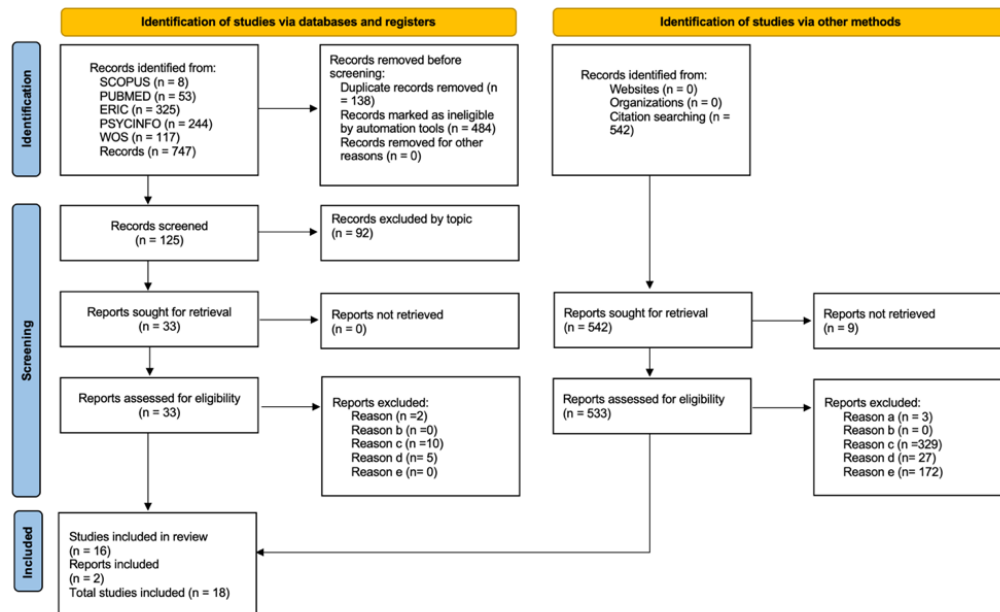
Following PRISMA recommendations (Page et al., 2021), we searched five databases with recognised coverage: Web of Science, Scopus, PubMed, ERIC, and PsycINFO. Searches were conducted from 11 April to 19 May 2025 using the following Boolean string: *(Secondary School OR Compulsory Secondary Education OR Obligatory Secondary Education OR Secondary Education) AND (Physical Education) AND (NPB OR BPN OR Basic Psychological Needs) AND (Intervention OR Experimental OR Quasi-experimental OR Randomized Controlled Trial)*.

The strategy was structured in three thematic blocks: (1) Physical Education; (2) Basic Psychological Needs; and (3) study design (intervention, experimental, quasi-experimental, randomised controlled trial, or descriptive). Duplicates were removed prior to screening.

### ***Study selection and data handling***

Titles and abstracts were screened against the inclusion criteria, yielding 16 eligible studies. Reference-list screening of these articles identified two additional studies, resulting in a final sample of 18 investigations. Screening was undertaken independently by two PE scholars. Discrepancies were resolved through discussion and consensus; when uncertainty remained, a third reviewer—specialised in PE and systematic reviews—made the final determination. A PRISMA flow diagram (Figure 1) visually summarises the selection process.

Figure 1. Flow Diagram (PRISMA, 2020)



## Quality of the Studies

After selecting the articles included in the review, their methodological quality was assessed using the tool “Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields” (Kmet et al., 2004), which was applied not only to quantitative studies, but also to qualitative and mixed-methods ones. For quantitative studies, 14 criteria were established in relation to research design, sample characteristics, methods employed, data analysis, as well as the presentation of results and conclusions. On the other hand, for qualitative and mixed-methods studies, 10 criteria were used concerning the methods employed, the depth of the analysis, and coherence.

Each of the criteria was scored on a scale from 0 to 2 points, where 2 indicates that it is satisfactorily met, 1 that it is partially met, and 0 that it is not met. In the case of quantitative studies, “NA” was assigned when the criterion was not applicable to the study. The final score for quantitative studies was calculated using the formula:

$$\frac{[(\text{number of satisfactorily met items} \times 2) + (\text{number of partially met items} \times 1)]}{(28 - \text{number of non-applicable items} \times 2)}$$
 For mixed-methods and qualitative studies, a similar formula was used, adjusting the denominator to the total number of criteria assessed in these cases: 
$$\frac{[(\text{number of satisfactorily met items} \times 2) + (\text{number of partially met items} \times 1)]}{(20)}$$
 In this case, there were no “non-applicable” items. The results obtained were expressed as percentages, ranging from 0 to 100%, allowing comparison of the methodological quality of these studies. To ensure objectivity and reliability in the evaluation process, two researchers conducted the assessment independently. This procedure enabled the standardisation of quality assessment across studies with different methodological approaches, guaranteeing transparency and rigour in the analysis.

Table 1 presents the results of the methodological quality assessment of the included studies, expressed as percentages ranging from 0 to 100%. Scores ranged between .53 and .95, reflecting moderate variability in the quality of the studies analysed. To guarantee reliability of the ratings, the intraclass correlation coefficient (ICC) was calculated between the scores assigned by the two independent observers, obtaining a value of .831 ( $p < .001$ ). According to the criteria established by Koo and Li (2016), this result corresponds to a level of agreement considered good, which supports the consistency of the evaluation process. In order to establish a rigorous filter for the selection of studies, a conservative threshold of 50% was applied, so that only those articles achieving at least this percentage of methodological quality were considered. In terms of individual results, the first observer recorded scores between .53 and .92, while the second observer obtained values between .61 and .95, confirming a high degree of concordance between both evaluators and reinforcing the reliability of the analysis conducted.

Table 1. Quality Assessment of the Studies

Studies	Rater 1	Rater 2
Fierro-Suero et al. (2020)	.92	.95
Claver et al. (2020)	.85	.95
García- González et al. (2020)	.64	.75
Cuevas- Campos et al. (2020)	.85	.90
Palau- Pamies et al. (2020)	.71	.87
Estrada et al. (2021)	.82	.91
Real-Pérez et al. (2021)	.71	.87
Pellicer et al. (2021)	.57	.61
Franco et al. (2021)	.53	.67
Fernández-Río et al. (2022)	.78	.87
Méndez- Giménez et al. (2022)	.78	.87
Soriano- Pascual et al. (2022)	.78	.71
Giménez et al. (2023)	.85	.75
Lozano et al. (2024)	.90	.90
García et al. (2024)	.90	.90
Morena et al (2024)	.70	.65
Méndez- Giménez & Garví- Medrano (2025)	.67	.75
Ochoa-Ávalos et al. (2025)	.82	.71

## Results

### Study design

This review included a total of 18 studies. The majority adopted a quantitative approach ( $n = 14$ ), while three employed mixed methodologies (Giménez et al., 2023; Lozano et al., 2024; García et al., 2024) and one followed a qualitative approach (Morena et al., 2024). Within the group of quantitative investigations, quasi-experimental designs were the most frequent ( $n = 7$ ), used in the studies by Palau-Pàmies et al. (2021), Estrada et al. (2021), Real-Pérez et al. (2021), Franco et al. (2021), Fernández-Río et al. (2022), Méndez-Giménez & Garví-Medrano (2025), and Ochoa-Ávalos et al. (2025). In addition, three studies were cross-sectional (Fierro-Suero et al., 2020; Claver et al., 2020; Cuevas-Campos et al., 2020). Likewise, two pre-experimental pre-/post-test studies were identified (García-González et al., 2020; Lozano et al., 2024), in which a pedagogical intervention was applied to a single group of students, assessing the effects before and after the programme. Another study, conducted by Méndez-Giménez et al. (2022), was classified as a longitudinal pre-experimental design, since the intervention was implemented over the course of a full academic year. Additionally, two studies were comparative pre-experimental designs: Pellicer et al. (2021), which compared the practice of an individual sport (orienteering) with a team sport (floorball) over six weeks, and Giménez et al. (2023), which analysed the effects of fixed versus rotating roles across two consecutive teaching units. Finally, García et al. (2024) implemented a mixed quasi-experimental design, combining the application of the TGfU model with quantitative and qualitative analyses, and a qualitative descriptive cross-sectional study was included (Morena et al., 2024), which aimed to explore students' experiences in depth through interviews and systematic observations.

### Characteristics of the Participants

The studies were conducted primarily in Spain ( $n = 17$ ), with a single study carried out in Mexico (Ochoa-Ávalos et al., 2025). All research was undertaken in the context of Compulsory Secondary Education, with participants aged between 11 and 18 years. Sample sizes ranged from 26 students (Lozano et al., 2024) to 919 students (Claver et al., 2020). Most studies included both boys and girls, with relatively balanced proportions, although some presented slightly uneven gender distributions. No study focused exclusively on a single sex.

### Duration of the Programmes

The duration of the interventions showed substantial variability. The shortest programmes consisted of 6 sessions lasting 50–55 minutes (Palau-Pàmies et al., 2021; Lozano et al., 2024), whereas the longest extended over an entire academic year (Méndez-Giménez et al., 2022). Several interventions had an intermediate duration of 6 to 9 weeks (Pellicer et al., 2021; Franco et al., 2021; Fernández-Río et al., 2022; Soriano-Pascual et al., 2022), while others lasted for a semester or academic term (Estrada et al., 2021; Ochoa-Ávalos et al., 2025). Regarding lesson length, most programmes were delivered in 50–60-minute sessions, although some included sessions lasting up to 90 minutes (Fernández-Río et al., 2022).



## Focus of the Studies and Context

The analysis of the studies included in this review revealed that most of them primarily aimed to examine the satisfaction of BPN—autonomy, competence, and relatedness—within the context of PE, often through the implementation of innovative pedagogical methodologies.

In total, 18 investigations were identified. Of these, 15 implemented active interventions. The most prominent were those based on the Sport Education Model (SEM) ( $n = 3$ ) (Franco et al., 2021; Méndez-Giménez et al., 2022; Giménez et al., 2023). Gamification-based programs were also frequent ( $n = 3$ ) (Real-Pérez et al., 2021; Fernández-Río et al., 2022; Soriano-Pascual et al., 2022). Two studies implemented cooperative learning or cooperative challenges (Palau-Pàmies et al., 2021; Lozano et al., 2024). Moreover, hybrid approaches were explored, such as SEM combined with Teaching Games for Understanding (TGfU) (García-González et al., 2020), or game invention integrated with self-construction of materials (Méndez-Giménez & Garví-Medrano, 2025). García et al. (2024) also designed an intervention based exclusively on the TGfU model. Other pedagogical frameworks included the Teaching Personal and Social Responsibility model (TPSR) (Ochoa-Ávalos et al., 2025), project-based learning (PBL) with a narrative approach (Morena et al., 2024), and a long-term program based on Epstein's TARGET strategies (Estrada et al., 2021). Finally, Pellicer et al. (2021) conducted a comparative intervention between an individual sport (orienteering) and a team sport (floorball).

Additionally, three cross-sectional studies were identified. All of them adopted a quantitative approach, focusing on the motivational climate and its relationship with the satisfaction or frustration of BPN and students' motivation in PE (Fierro-Suero et al., 2020; Claver et al., 2020; Cuevas-Campos et al., 2020).

Table 2 presents the main characteristics of the 18 studies included in this review, organised according to the most relevant criteria: authors (and year), country, educational context, sample and age, methodology and study design, duration of the intervention, and applied protocol

Table 2. Main Characteristics of the Study Sample

Authors (year)	Country	Context	Participants	Age	Methodology	Study design	Duration	Control protocol	Experimental protocol
Fierro-Suero et al. (2020)	Spain	Secondary Education	723 pupils (449 boys, 374 girls)	11–16 years	Quantitative	Cross-sectional	20 minutes (in-class administration)	N/A.	During regular PE lessons, pupils completed SBPN-4 (teacher support for BPN including novelty), a BPN satisfaction scale, and an intrinsic motivation subscale (Perceived Locus of Causality).
Claver et al. (2020)	Spain	Secondary Education	919 pupils (433 boys, 486 girls)	12–18 years	Quantitative	Cross-sectional	15 minutes (in-class administration)	N/A.	In regular PE, pupils completed measures of motivational climate, BPN in exercise, perceived locus of causality, and (in)disciplinary behaviours.
García-González et al. (2020)	Spain	Secondary Education	49 pupils (~51% boys, ~49% girls)	15 years	Quantitative	Pre-experimental pre/post	10 lessons (volleyball unit)	N/A.	Hybrid SEM/TGfU volleyball unit (season, team affiliation, formal competition, records, culminating event; TGfU representation/exaggeration/tactical complexity). Questionnaires completed (~25 min).
Cuevas-Campos et al. (2020)	Spain	Secondary Education	480 pupils (265 girls, 215 boys)	12–18 years	Quantitative	Cross-sectional	25 minutes (in-class administration)	N/A.	In regular classes, pupils completed BPN satisfaction and frustration, motivation, sport satisfaction (enjoyment/boredom), and intention to be physically active; researcher provided instructions.
Palau-Pàmies et al. (2021)	Spain	Secondary Education	185 pupils (EG=99; CG=86)	12–16 years	Quantitative	Quasi-experimental	Six 55-min lessons	Badminton unit taught with passive, modified command-style direct instruction	Active methodology based on 12 cooperative challenges; pupils worked in teams to solve progressively complex tasks with agreed rules and required materials.



Estrada et al. (2021)	Spain	Secondary Education	323 pupils (EG=175; CG=148)	12–17 years	Quantitative	Quasi-experimental	5 months	(traditional approach). Traditional performance-oriented climate (emphasis on comparison, competition, low autonomy, uniform pacing). Pre/post measures matched the EG.	TARGET strategies (task variety, cooperation, individualised autonomy, adapted pacing) implemented across regular sessions; identical pre/post measures.
Real-Pérez et al. (2021)	Spain	Secondary Education	98 pupils (CG=49; EG=49)	15–17 years	Quantitative	Quasi-experimental	5-week unit; 2×60-min/week	Same unit/content with traditional instruction (direct teaching, task assignment). Pre/post instruments administered.	Gamified expressive movement/dance unit structured in three phases: immersion, specification, and transposition; pre/post instruments administered.
Pellicer et al. (2021)	Spain	Secondary Education	136 pupils (64 girls, 72 boys)	11–16 years	Quantitative	Pre-experimental pre/post (comparative, two EG sequences)	6 weeks (two consecutive units: 6 orientation + 6 floorball sessions)	N/A (two experimental sequences; no separate CG).	Group E1 and E2 completed two interventions: (1) orienteering (map/compass reading, terrain interpretation, courses) and (2) floorball (stick/ball handling, tactical/technical work). Baseline, post-test after each unit.
Franco et al. (2021)	Spain	Secondary Education	50 pupils (28 boys, 22 girls)	14–15 years	Quantitative	Quasi-experimental	8×50-min lessons (basketball)	Traditional basketball teaching (teacher-led decisions, repetitive drills, brief small-sided play at the end). Pre/post measures.	SEM-based basketball season (teams, formal competition, records, culminating event and festivity) with elements of guided discovery; roles defined and enacted by pupils. Pre/post measures.
Fernández-Río et al. (2022)	Spain	Secondary Education	54 pupils (EG=27; CG=27)	≈14 years	Quantitative	Quasi-experimental	9 weeks (1×90-min/week)	Jump-rope & Double Dutch taught traditionally (skill acquisition, direct instruction, guided practice). Pre/post measures.	Gamified unit inspired by “Dragon Ball Z” with narrative, quests, points, levels, badges, teams, avatars, rewards; pre/post measures.
Méndez-Giménez et al. (2022)	Spain	Secondary Education	212 pupils (123 boys, 89 girls)	12–18 years	Quantitative	Pre-experimental longitudinal	Full school year (Sept–June)	N/A.	SEM-based programme across five seasons (2 sessions/week) featuring team affiliation, formal competition, culminating events, performance records and festivity; four waves of measurement (T1–T4).
Soriano-Pascual et al. (2022)	Spain	Secondary Education	66 pupils (EG=33; CG=33)	13–16 years	Quantitative	Quasi-experimental	4 weeks (7×50-min sessions)	Same orienteering content and duration taught traditionally (“Introduction to	Gamified orienteering unit—“The Reconquest of the Outlaws”—with narrative, avatars, badges, points, etc.; pre/post measures.

									orienteeing” , direct instruction without gamification; pre/post measures.
Giménez et al. (2023)	Spain	Secondary Education (social vulnerability context)	96 pupils (53 boys, 43 girls)	≈12 years	Mixed-methods	Pre-experimental pre/post (comparative, two EG sequences)	Two consecutive invasion-games units (basketball & floorball): 24 sessions (12+12) ×60-min	N/A (counterbalanced sequences; no separate CG).	Two SEM-based seasons. EG1: fixed roles first, rotating roles second; EG2: rotating first, fixed second. Phases: introductory, guided, autonomous practice, formal competition, culminating event. Pre/post measures + interviews.
Lozano et al. (2024)	Spain	Secondary Education	26 pupils (18 boys, 8 girls)	12–13 years	Mixed-methods	Pre-experimental pre/post	Six 55-min lessons	N/A.	Conditioning unit using suspension training (TRX) framed by Cooperative Learning ‘Cycle’: group creation/cohesion, CL as content, CL as pedagogical resource; complementary roles assigned; pre/post measures + focus group.
García et al. (2024)	Spain	Secondary Education	151 pupils (EG=74; CG=77)	12–15 years	Mixed-methods	Quasi-experimental	11×50-min lessons	Traditional teaching (direct instruction, isolated technical practice; warm-up, main part, cool-down).	TGFU model with modified games (exaggeration/representation), technical-tactical reinforcement tasks, game situations, and final reflection; pre/post measures + focus groups.
Morena et al. (2024)	Spain	Secondary Education	32 pupils (14 girls, 18 boys)	13–14 years	Qualitative	Descriptive cross-sectional	6 weeks (12 sessions: April–May)	N/A.	PBL themed around the ‘Avatar’ saga; sessions with teacher explanation, two central activities, final scoring and team decision-making; qualitative assessment of competence, teamwork, narrative, theme, points.
Méndez-Giménez & Garvía-Medrano (2025)	Spain	Secondary Education	99 adolescents (47 boys, 52 girls)	11–13 years	Quantitative	Quasi-experimental	9 sessions	Programme including circus games and an invasion game (ball-tower) taught through guided discovery and task assignment to work on coordination and balance; pre/post measures.	Hybridisation of ‘games invention’ and ‘self-construction of equipment’: teams designed invasion, net/wall, and object-manipulation games; phases: building materials & game design, testing own & peers’ games, refinement, set-up, and championship; pre/post measures.
Ochoa-Ávalos et al. (2025)	Mexico	Secondary Education	158 pupils (EG=78; CG=80)	12–15 years	Quantitative	Quasi-experimental	22 weeks	Usual PE lessons without the Teaching Personal and Social Responsibility (TPSR/MRPS) model; pre/post measures.	TPSR model implemented in four parts each lesson: awareness talk, responsibility in action, group meeting, and individual/group evaluation; pre/post measures.

Table 3 summarises the treatment variables and the main findings of the 18 studies included. For each study, the objective, variables, instruments used, and main outcomes are presented. The results of the 18 studies included in this review have been organised into three main categories to facilitate understanding: (a) motivational variables and satisfaction of BPN; (b) psychosocial and educational variables; and (c) cross-sectional and validation studies.

#### a) Motivational variables and satisfaction of BPN

Several interventions showed significant improvements in the satisfaction of BPN (autonomy, competence, relatedness, and novelty) and in students' self-determined motivation. Implementations based on the Sport Education Model (SEM) (Franco et al., 2021; Méndez-Giménez et al., 2022; Giménez et al., 2023) enhanced autonomy and competence, as well as behavioural engagement. Hybrid SEM/TGfU programmes (García-González et al., 2020; García et al., 2024) and cooperative learning methodologies (Pallau-Pàmies et al., 2021; Lozano et al., 2024) led to increases in motivation and novelty satisfaction, with some gender differences observed.

Gamification-based approaches (Real-Pérez et al., 2021; Fernández-Río et al., 2022; Soriano-Pascual et al., 2022) increased intrinsic motivation, the intention to be physically active, and enjoyment, while reducing amotivation and boredom. However, in the case of the TPSR model (Ochoa-Ávalos et al., 2025), results were mixed: improvements were observed in competence and responsibility, but decreases were reported in autonomy and satisfaction.

#### b) Psychosocial and educational variables

Active interventions also generated relevant effects at the social and educational level. SEM combined with role dynamics (Giménez et al., 2023) fostered cooperation and cohesion, although rotating roles revealed gender differences, with girls showing lower intrinsic motivation. Cooperative learning (Pallau-Pàmies et al., 2021; Lozano et al., 2024) strengthened group cohesion and social relationships, while gamification proved effective in reducing disruptive behaviours and fostering a positive classroom climate (Soriano-Pascual et al., 2022). Likewise, the TARGET strategies (Estrada et al., 2021) improved prosocial behaviours, fair play, and the intention for future practice. Innovative proposals such as narrative-based PBL (Morena et al., 2024) or the hybridisation of pedagogical models (Méndez-Giménez & Garvía-Medrano, 2025) enhanced cooperation, engagement, and social responsibility. In a comparative study, it was observed that individual sports (orienteering) fostered greater autonomy and competence than team sports (floorball) (Pellicer et al., 2021).

#### c) Cross-sectional and validation studies

Cross-sectional and validation studies provided highly relevant complementary evidence. Fierro-Suero et al. (2020) validated the SBPN-4 questionnaire, confirming the relevance of including novelty support as a fourth BPN and showing its positive relationship with intrinsic motivation. Claver et al. (2020) demonstrated that a task-oriented motivational climate predicted higher levels of discipline and better academic performance. Finally, Cuevas-Campos et al. (2020) highlighted the central role of competence satisfaction as a predictor of self-determined motivation, enjoyment, and the intention to be physically active.

Table 3. Treatment Variables and Main Outcomes of Physical Education in relation to Basic Psychological Needs

Authors	Objectives	Variables	Instruments	Main Results
Fierro-Suero et al. (2020)	Validate the Support for Basic Psychological Needs-4 (SBPN-4) questionnaire in PE, including novelty support. Examine a mediation model analysing the effect of novelty support from teachers on BPN satisfaction and students' intrinsic motivation.	Perceived teacher support for BPN (autonomy, competence, relatedness, novelty); Satisfaction of BPN; Intrinsic motivation	Support for BPN Questionnaire in PE; BPNin Exercise Scale; Novelty Need Satisfaction Scale; Intrinsic Motivation Subscale of the Perceived Locus of Causality Scale	The SBPN-4 questionnaire showed good psychometric properties to measure support for BPN, including novelty. Students reported high levels of autonomy, competence and relatedness. Teacher novelty support positively influenced novelty satisfaction, which increased intrinsic motivation.
Claver et al. (2020)	Develop a predictive model of disciplined behaviours and academic performance (PE-specific and general) by integrating AGT and SDT constructs.	Task-oriented motivational climate; BPN; Academic performance	Learning and Achievement Orientation in PE Questionnaire; BPNin Exercise Scale; Perceived Locus of Causality Scale; Disciplined and	Task-oriented climate predicted higher motivation, more disciplined behaviour and better academic performance.

		Undisciplined Behaviour Inventory in PE		
García-González et al. (2020)	Examine whether the effects of a hybrid SE/TGFU volleyball unit were equally effective on SDT-related variables depending on students' initial motivational profiles.	Pedagogical model; Initial motivation; BPN; Motivation; Intention to be physically active	Support for BPN in PE Questionnaire; BPN in Exercise Scale; Novelty Satisfaction Scale; Perceived Variety Questionnaire; Perceived Locus of Causality Questionnaire; Intention to be Physically Active Scale	Significant increases in BPN support and satisfaction, novelty and variety in all profiles, but not in intention to be physically active. More effective in students with low or moderate initial motivation.
Cuevas-Campos et al. (2020)	Test a theoretical SDT-based model to analyse the influence of BPN satisfaction and frustration on motivation, enjoyment, boredom, burnout, and intention to be physically active.	BPN satisfaction and frustration; Motivation; Enjoyment; Boredom; Burnout; Intention to be physically active	BPN in Exercise Scale; Motivation in PE Questionnaire; Sport Satisfaction Instrument; Athlete Burnout Questionnaire; Intention to be Physically Active Scale	Frustration of BPN increased boredom and demotivation. Competence satisfaction most strongly predicted autonomous motivation, enjoyment and intention to be physically active.
Palau-Pàmies et al. (2021)	Analyse the impact of Cooperative Learning (CL) on BPN satisfaction in secondary students compared to traditional teaching.	BPN satisfaction; Cooperative Learning; Gender	BPN in Exercise Scale	Positive effects of CL on BPN satisfaction, particularly in relatedness. Control group also improved in autonomy and competence but not in relatedness.
Estrada et al. (2021)	Evaluate the effects of Epstein's TARGET strategies in PE classes taught by teachers with previous motivational climate training.	TARGET-based intervention; BPN; Motivational climate; Intention to practise physical activity/sport; Peer relations; Fair play behaviours	BPN in Exercise Scale; Perceived Locus of Causality Scale; Fair Play Attitudes Scale	Control group (performance climate) showed negative outcomes in BPN satisfaction, motivation, fair play and future sport intention. Experimental group improved significantly in all variables.
Real-Pérez et al. (2021)	Compare the effect of gamification-based methodology vs traditional teaching on situational motivation in body expression contents.	Gamification; Traditional teaching; BPN support; Motivation; Predisposition towards PE; Enjoyment/boredom	Support for BPN Questionnaire; BPN Measurement Scale; Motivation in PE Questionnaire; Predisposition towards PE Scale; Sport Satisfaction Instrument	Gamification increased autonomy, intrinsic motivation, enjoyment and reduced demotivation. Traditional teaching improved competence and relatedness but raised boredom and amotivation.
Pellicer et al. (2021)	Compare BPN satisfaction between an individual sport (orienteering) and a team sport (floorball) in secondary PE.	Sport type; Gender; BPN	BPN Measurement Scale	Orienteering improved autonomy (especially in girls) and maintained higher competence and relatedness than floorball, which showed no significant improvements.
Franco et al. (2021)	Examine the effect of a SE-based intervention during COVID-19 on BPN satisfaction, intrinsic motivation and behavioural engagement.	Pedagogical model; BPN satisfaction; Intrinsic motivation; Engagement	BPN in Exercise Scale; Intrinsic Motivation Subscale of Perceived Locus of Causality; PE Engagement Questionnaire	SE improved BPN satisfaction and engagement, but not intrinsic motivation. Traditional teaching decreased relatedness satisfaction.
Fernández-Río et al. (2022)	Compare gamification vs traditional instruction on intrinsic motivation, BPN satisfaction and intention to be physically active.	Gamification; Intrinsic motivation; BPN satisfaction; Intention to be physically active	Intrinsic Motivation Subscale of Perceived Locus of Causality; BPN Satisfaction and Frustration Scale; Intention to be Physically Active Scale	Gamification increased intrinsic motivation, BPN satisfaction and intention to be active, especially when rewards supported autonomy.
Méndez-Giménez et al. (2022)	Examine the effect of a year-long SE programme on autonomous motivation, BPN, emotional intelligence, life satisfaction and intention to be physically active.	SE-based programme; BPN; Autonomous motivation; Emotional intelligence; Wellbeing	BPN in Exercise Scale; Perceived Locus of Causality; Emotional Intelligence in PE Questionnaire; Life Satisfaction Questionnaire; Intention to be Physically Active Scale	Positive cumulative effect on autonomy, competence, autonomous motivation, emotional regulation and empathy, especially in first-year students.
Soriano-Pascual et al. (2022)	Compare gamification vs traditional methodology on students' attitudes, goals, BPN and disruptive behaviours.	Gamification vs traditional teaching; Goal orientation; BPN; Disruptive behaviours	Perception of Success Questionnaire; BPN Questionnaire; Behaviour in PE Questionnaires	Gamification increased task orientation, autonomy, relatedness and reduced ego orientation and disruptive behaviours. Control group showed decreased motivation.
Giménez et al. (2023)	Evaluate the impact of fixed vs rotating roles on motivational variables and friendship goals in socially vulnerable adolescents.	Role dynamics; Gender; Friendship goals; Achievement goals; BPN; Novelty; Motivational regulations	Friendship Goals in PE Questionnaire; 3x2 Achievement Goals Questionnaire; BPN in Exercise Scale; Novelty Satisfaction Scale;	Fixed roles more suitable for vulnerable contexts. Rotating roles reduced demotivation but had negative effects on girls' intrinsic motivation. Boys improved competence and novelty but autonomy and relatedness were unaffected.

			Perceived Locus of Causality; Semi-structured interviews	
Lozano et al. (2024)	Examine the effect of Cooperative Learning in suspension training (TRX) on BPN satisfaction considering gender differences.	BPN satisfaction; Gender; Cooperative Learning; Suspension training	BPN Satisfaction in PE Scale (including novelty); Focus groups	Significant improvement only in novelty. Boys improved novelty satisfaction more than girls. Qualitative data highlighted positive perceptions of all BPN.
García et al. (2024)	Analyse the effect of TGfU on motivation and BPN satisfaction in 1st-year secondary students.	BPN satisfaction; Motivation	BPN in Exercise Scale (+ novelty items); Perceived Locus of Causality Scale; Focus groups	Increased BPN satisfaction and autonomous motivation in the TGfU group compared to traditional.
Morena et al. (2024)	Develop and implement a PBL-based proposal in PE and analyse its impact on motivation and BPN.	BPN satisfaction; Motivation; Competence perception; Teamwork	Personal interviews; Direct observation	Increased motivation and BPN satisfaction. Gamification and active dynamics fostered student engagement.
Méndez-Giménez & Garvía-Medrano (2025)	Examine the effect of hybridisation (student-designed games and materials) on motivational regulations, SDI, BPN, cooperation and responsibility.	BPN; Motivational regulations; Self-Determination Index; Cooperation; Responsibility	BPN in Exercise Scale; Perceived Locus of Causality; Cooperative Learning Questionnaire; Personal and Social Responsibility Questionnaire	Significant improvements in BPN, autonomy (decision-making), competence (game adaptation) and relatedness (positive interactions). Hybridisation enhanced cooperation and responsibility.
Ochoa-Ávalos et al. (2025)	Evaluate the effect of TPSR on BPN, responsibility, satisfaction and boredom in Mexican adolescents.	TPSR; BPN (autonomy, competence, relatedness); Satisfaction; Boredom; Gender	Personal and Social Responsibility Questionnaire; BPN Satisfaction Scale; PE Satisfaction Scale	TPSR improved social responsibility and competence, especially in boys. No significant changes in most BPN post-test. Both groups increased boredom; autonomy and satisfaction decreased in experimental group.

## Discussion

This review was conducted with the dual purpose of identifying and analysing studies that address the satisfaction of BPN among secondary school students within the field of PE, as well as examining interventions aimed at promoting them. In this regard, the findings reaffirm the principles of Self-Determination Theory (Ryan & Deci, 2000; Balaguer et al., 2008), which posits that the satisfaction of autonomy, competence, relatedness, and, more recently, novelty, constitutes an essential element for fostering self-determined motivation, well-being, and active engagement in educational contexts.

The results derived from cross-sectional studies clearly highlight the relevance of a motivational climate centred on task mastery and personal improvement. Fierro-Suero et al. (2020) validated the SBPN-4 questionnaire and identified novelty as a fourth fundamental need in the PE context, confirming its positive influence on intrinsic motivation. Complementarily, Claver et al. (2020) demonstrated that a task-oriented classroom climate, rather than one based on social comparison, promoted more disciplined behaviours and improved academic performance. Similarly, Cuevas-Campos et al. (2020) emphasised the central role of competence, which exerted a positive effect on self-determined motivation, enjoyment, and the future intention to be physically active. These findings are consistent with Cajilema & León (2023), who stress that in educational settings it is essential to create contexts that meet these needs in order to ensure engagement and adherence to physical activity. In this regard, it also coincides with previous studies that highlight the satisfaction of these needs through PE and its relationship with motivation, involvement and a more positive attitude towards physical activity (Cuevas et al., 2018; González-Cutre et al., 2018; Serrano et al., 2016; Torres et al., 2015).

With regard to intervention studies, it is evident that active and innovative methodologies most consistently promote the satisfaction of BPN. Interventions based on the Sport Education Model (SEM) (Franco et al., 2021; Méndez-Giménez et al., 2022; Giménez et al., 2023) proved effective in enhancing autonomy, competence, and relatedness, as well as encouraging greater behavioural engagement. These results are in line with previous research highlighting the value of SEM as a strategy to foster meaningful learning and student engagement (Fernández-Río & Méndez-Giménez, 2016). Moreover, hybrid programmes such as SEM/TGfU (García-González et al., 2020; García et al., 2024) were particularly useful in boosting self-determined motivation, with more noticeable effects among students with initially low or moderate levels of motivation. This aspect can also be extrapolated in terms of gender in terms of involvement and participation in PE sessions, as demonstrated by recent systematic reviews (Caracuel-Cáliz et al.,



2025) This reinforces the idea that these approaches are particularly beneficial for students with lower levels of motivation (Serrano et al., 2016; Torres et al., 2015).

Cooperative methodologies have also shown promising results. Palau-Pàmies et al. (2021) observed improvements in autonomy and competence in both genders, although significant increases in social relationships were evident only in the experimental group, suggesting that the benefits of cooperative learning are not uniform across all subgroups. It also coincides with recent reviews that point out that cooperative methodologies have an impact on motivation and involvement in PE in both boys and girls (Caracuel-Cáliz et al., 2025). Lozano et al. (2024) added further evidence, confirming that cooperative learning through suspension training enhanced novelty satisfaction, particularly in boys, although without significant improvements in the other dimensions. The findings of Lozano et al. (2024) contrast with those of Hervada et al. (2022), who emphasise the importance of this approach in promoting group cohesion and positive social interaction in physical education.

It also differs, in terms of motivation and social relationships, from recent meta-analyses on cooperative learning (Boke et al., 2025). In this sense, it is possible that the novelty of the content emphasised the improvement in terms of novelty.

Gamification represents another of the most prominent approaches in the reviewed literature. The studies by Real-Pérez et al. (2021), Fernández-Río et al. (2022), and Soriano-Pascual et al. (2022) consistently reported increases in intrinsic motivation, intention to be physically active, and enjoyment, while reducing amotivation and disruptive behaviours in class. These results are supported by previous evidence (Silva & Prieto, 2021), which has documented the potential of gamification to transform classroom dynamics and promote a more positive climate. However, not all programmes showed homogeneous effects. In this regard, methodologies that place students at the centre of learning seem to favour the satisfaction of the aforementioned BPN. Estrada et al. (2021), for instance, found that authoritarian, performance-oriented teacher climates not only limited the satisfaction of BPN but also generated frustration and demotivation, consistent with reports by Cuevas et al. (2018) and González-Cutre et al. (2018).

In this regard, several studies reveal nuances that warrant critical reflection. Palau-Pàmies et al. (2021) noted that the effects of cooperative challenges did not benefit the entire sample uniformly, underscoring the need to analyse in more depth which student characteristics modulate the effectiveness of each intervention. Likewise, Franco et al. (2021) showed that SEM significantly improved BPN satisfaction and behavioural engagement, but not always intrinsic motivation, evidencing that even within the same model there may be differences in the extent of its benefits. This variability aligns with Garaizabal-Buldain & González-Palomares (2020), who stress that the mere implementation of active methodologies does not in itself guarantee BPN satisfaction, but must be accompanied by a supportive motivational climate supports it through adult role models who facilitate such a classroom climate (Pelegrín et al., 2010).

The review also highlights the influence of contextual variables such as gender and socioeconomic status. Pellicer et al. (2021) found that female students achieved higher levels of autonomy in individual sports such as orienteering compared with team sports such as floorball, where no significant improvements were observed. Giménez et al. (2023), in turn, identified that fixed and rotating role dynamics generated different effects depending on gender and social vulnerability, with more positive results for boys and greater challenges for girls. These findings reinforce the need to adapt interventions to students' specific characteristics, as Trigueros-Ramos et al. (2019) highlight, emphasising the teacher's role in fostering trust and motivation towards physical activity.

Furthermore, other innovative approaches explored in the included studies broaden the pedagogical possibilities within PE. Problem-Based Learning with narrative elements (Morena et al., 2024) promoted greater engagement, motivation, and BPN satisfaction, aligning with the trend identified by authors who underscore the potential of active methodologies to integrate curricular and motivational content in the same teaching-learning process (Hervada et al., 2022). Similarly, the hybridisation of pedagogical models based on game invention and self-construction of materials (Méndez-Giménez & Garvía-Medrano, 2025) fostered autonomy, cooperation, and social responsibility, illustrating how creativity and student agency can become drivers of learning. Finally, the TPSR applied in Mexico (Ochoa-

Ávalos et al., 2025) yielded improvements in social responsibility and competence, although accompanied by declines in autonomy and satisfaction. This reflects the complexity of transferring interventions to diverse cultural contexts and supports the view that not all methodologies are equally effective across different realities (Cuevas et al., 2018). Similarly, it highlights the value of educational innovations, new trends and pedagogical models in influencing psychosocial variables through PE (Blázquez, 2017; Guíjarro et al., 2020; León-Díaz et al., 2023).

Despite the positive findings, some limitations must be acknowledged. There is a geographical bias, since the vast majority of studies were conducted in Spain, with only Ochoa-Ávalos et al. (2025) carried out in Mexico, which restricts the generalisability of results to other cultural and educational contexts. Moreover, not all studies included both control and experimental groups, which limits the strength of conclusions regarding intervention effectiveness. A predominance of quantitative studies was also noted, hindering deeper insights into students' subjective experiences. In this regard, the incorporation of mixed methodologies could enrich the analysis by combining numerical data with more qualitative narratives and perceptions.

From an applied perspective, the results of this review underscore the importance of continuing to advance in teacher training, equipping PE teachers with innovative strategies and resources that enable them to tailor interventions to students' characteristics. Likewise, it highlights the need to integrate digital technologies and ICT more systematically into this process, fostering both motivation and educational inclusion. Finally, future research should examine in greater detail the long-term effects of these methodologies, as well as their implementation in multicultural contexts, in order to generate more robust and transferable evidence. In doing so, the aim is not only to promote BPN satisfaction but also to contribute to the integral development of students in such a relevant area as PE. It would also be relevant to measure how teaching styles in PE influence the classroom environment, enjoyment and students' BPN, both in primary and secondary education. On the other hand, the diversity of content presented in this review points to another future line of research regarding the impact of different content on students' autonomy, competence, or relationships.

## Conclusions

In conclusion, the results show the importance of addressing students' BPN in PE classes, highlighting that simply participating in the classroom is not enough, but that it is important to implement active and inclusive methodologies that help to meet these needs. It is therefore essential to continue researching in different educational contexts in order to consolidate these findings.

It should also be noted that the context provided by PE is ideal for addressing these BPN. In this sense, the role of the teacher is fundamental in creating a motivating classroom environment where students feel supported by their teachers in this subject.

It is important to bear in mind that aspects such as motivation influence student involvement in PE. Analysis of the studies shows how PE interventions can help to meet the BPN. The evidence gathered highlights that implementing innovative methodologies adapted to the needs and interests of students promotes motivation and satisfaction with the BPN.

In this sense, such motivation towards the subject can lead to greater adherence to physical activity and its corresponding impact in terms of health. Likewise, greater participation, involvement and motivation in PE and physical activity will lead to an improvement in the overall well-being of students.

From a practical perspective, this review can serve as support for teachers and the educational community, providing them with an updated point of view that allows them to design more effective methodological proposals and adapted interventions, as well as to evaluate their results.

Finally, the need to expand research in various educational contexts and with more varied methodological approaches is emphasised, with the aim of consolidating evidence and contributing to the comprehensive development of students, not only in the physical dimension, but also in the social and emotional spheres.



## References

- Andreo, L. H., López, M. G., Mármol, A. G., Vélez, A. J. G., & Martínez, B. J. S. A. (2021). Necesidades psicológicas básicas y creencias implícitas de habilidad en educación secundaria. *Espiral. Cuadernos del profesorado*, 14(28), 19-27. <https://doi.org/10.25115/ecp.v14i28.4177>
- Balaguer, I., Castillo, I., & Duda, J. L. (2008). Apoyo a la autonomía, satisfacción de las necesidades, motivación y bienestar en deportistas de competición: un análisis de la teoría de la autodeterminación. *Revista de psicología del deporte*, 17(1), 123-139.
- Blázquez, D. (2017) (Ed.). *Métodos de enseñanza en Educación Física. Enfoques innovadores para la enseñanza de competencias*. Inde
- Boke, H., Aygun, Y., Tufekci, S., Yagin, F. H., Canpolat, B., Norman, G., Prieto-González, P., & Ardigò, L. P. (2025). Effects of cooperative learning on students' learning outcomes in physical education: a meta-analysis. *Frontiers in Psychology*, 16. <https://doi.org/10.3389/fpsyg.2025.1508808>
- Cajilema, L. A. Q., & León, D. A. H. (2023). Necesidades psicológicas básicas, adherencia e importancia de la Educación Física en estudiantes de básica superior. *Polo del Conocimiento*, 8(12), 19-32
- Caracuel-Cáliz, R. F., Armada-Crespo, J. M., & Abad-Robles, M. T. (2025). Active methodologies and gender equality in physical education: A systematic review. *Apunts Educación Física y Deportes*, 162, 31-42. [https://doi.org/10.5672/apunts.2014-0983.es.\(2025/4\).162.04](https://doi.org/10.5672/apunts.2014-0983.es.(2025/4).162.04)
- Castillo, I., Balaguer Solá, I., & García-Merita, M. (2007). Efecto de la práctica de actividad física y de la participación deportiva sobre el estilo de vida saludable en la adolescencia en función del género. *Revista de psicología del deporte*, 16(2), 0201-210.
- 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>
- Costa, C. M., de Mattos, C. A., & Cuce, M. R. (2007). The PICO strategy for the research question construction and evidence search. *Revista Latino-Americana de Enfermagem*, 15(3), 508-511. <https://doi.org/10.1590/S0104-11692007000300023>
- Cuevas-Campos, R., Fernández-Bustos, J. G., González-Cutre, D., & Hernández-Martínez, A. (2020). Need satisfaction and need thwarting in physical education and intention to be physically active. *Sustainability*, 12(18), 7312. <https://doi.org/10.3390/su12187312>
- Cuevas, R., García-Calvo, T., González, J., & Fernández-Bustos, J. G. (2018). Necesidades psicológicas básicas, motivación y compromiso en educación física. *Revista de psicología del deporte*, 27(1), 97-104.
- Cuevas, R., López, L. G., & Contreras, O. (2015). Influencia del modelo de Educación Deportiva en las necesidades psicológicas básicas. *Cuadernos de Psicología del Deporte*, 15(2), 155-162. <https://dx.doi.org/10.4321/S1578-84232015000200017>
- Deci, E. L. & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum Press.
- Deci, E. L. & Ryan, R. M. (2002). *Handbook of self-determination research*. University of Rochester Press.
- Deci, E. L. & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behaviour. *Psychological Inquiry*, 11, 227-268.
- Díaz, Ó. L., Mediavilla, A. A., Santos-Pastor, M., & Muñoz, L. F. M. (2020). Las metodologías activas en Educación Física: Una aproximación al estado actual desde la percepción de los docentes en la Comunidad de Madrid. *Retos: nuevas tendencias en educación física, deporte y recreación*, (38), 587-594. <https://doi.org/10.47197/retos.v38i38.77671>
- Estrada, J. A. C., de Mesa, C. G. G., Suárez, R. L., Pérez, C. R., & Martínez, D. A. (2021). Teachers motivational climate and target strategies intervention effect on secondary school physical education classes. *Revista iberoamericana de psicología del ejercicio y el deporte*, 16(4), 4.
- Fernández-Río, J., de las Heras, E., González, T., Trillo, V., & Palomares, J. (2020). Gamification and physical education. Viability and preliminary views from students and teachers. *Physical education and sport pedagogy*, 25(5), 509-524. <http://dx.doi.org/10.1080/17408989.2020.1743253>
- Fernández-Río, J., & Méndez-Giménez, A. (2016). El aprendizaje cooperativo: Modelo pedagógico para Educación Física. *Retos. Nuevas Tendencias en Educación Física, Deporte y Recreación*, (29), 201-206. <https://doi.org/10.47197/retos.v0i29.38721>



- Fernandez-Rio, J., Zumajo-Flores, M., & Flores-Aguilar, G. (2022). Motivation, basic psychological needs and intention to be physically active after a gamified intervention programme. *European Physical Education Review*, 28(2), 432-445. <https://doi.org/10.1177/1356336X211052883>
- Fierro-Suero, S., Almagro, B. J., Sáenz-López, P., & Carmona-Márquez, J. (2020). Perceived novelty support and psychological needs satisfaction in physical education. *International journal of environmental research and public health*, 17(11), 4169. <http://dx.doi.org/10.3390/ijerph17114169>
- Franco, E., Tovar, C., González-Peño, A., & Coterón, J. (2021). Effects of a sport education model-based teaching intervention on students' behavioral and motivational outcomes within the physical education setting in the COVID-19 scenario. *Sustainability*, 13(22), 12468. <https://doi.org/10.3390/su132212468>
- Garaizabal-Buldain, M., & González-Palomares, A. (2020). La coeducación en educación física: propuesta de intervención para alumnado de 5º y 6º de Primaria. *Revista Española de Educación Física y Deportes*, (430), Pág.69. <https://doi.org/10.55166/reefd.vi430.922>
- García-González, L., Abós, Á., Diloy-Peña, S., Gil-Arias, A., & Sevil-Serrano, J. (2020). Can a hybrid sport education/teaching games for understanding volleyball unit be more effective in less motivated students? An examination into a set of motivation-related variables. *Sustainability*, 12(15), 6170. <https://doi.org/10.3390/su12156170>
- García, M. G., Rocamora, A. M., Vivas, M. M., & Bartoll, O. C. (2024). Contribuciones del modelo Teaching Games for Understanding a la motivación y necesidades psicológicas básicas del alumnado. *Retos: nuevas tendencias en educación física, deporte y recreación*, (54), 825-834. <https://doi.org/10.47197/retos.v54.99741>
- Giménez, A. M., Navarrete, M. D. P. M., Maxera, F. P., & de Ojeda, D. M. (2023). Efectos motivacionales tras la aplicación de roles fijos y rotativos mediante el modelo de Educación Deportiva en Educación Física. *Cultura, ciencia y deporte*, 18(56), 15-28. <https://doi.org/10.12800/ccd.v18i56.1177>
- Gómez López, M., Martínez Hernández, A., & Granero Gallegos, A. (2021). Satisfacción de las necesidades psicológicas básicas en las clases de Educación Física y su relación con el miedo al fallo según el género y la práctica físico-deportiva extraescolar de los estudiantes de Educación Secundaria. *Estudios pedagógicos (Valdivia)*, 47(1), 303-322. <http://dx.doi.org/10.4067/S0718-07052021000100303>
- González-Cutre, D., Sierra, A. C., Beltrán-Carrillo, V. J., Peláez-Pérez, M., & Cervelló, E. (2018). A school-based motivational intervention to promote physical activity from a self-determination theory perspective. *The journal of educational research*, 111(3), 320-330. <http://dx.doi.org/10.1080/00220671.2016.1255871>
- Granero Gallegos, A., & Gómez López, M. (2020). La motivación y la inteligencia emocional en Secundaria: diferencias por género. *Revista Infad de Psicología*, 1(1), 101-110
- Guijarro, E., Evangelio, C., González Villora, S., & Arias-Palencia, N. M. (2020). Hybridizing Teaching Games for Understanding and Cooperative Learning: an educational innovation. *Education, Sport, Health and Physical Activity*, 4(1), 49-62.
- Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. *Campbell systematic reviews*, 18(2), e1230. <https://doi.org/10.1002/cl2.1230>
- Hernández, Á. A., & Estero, J. L. A. (2021). Experiencia práctica empleando la gamificación y las tics en la clase de educación física en educación secundaria. *Athlos: Revista internacional de ciencias sociales de la actividad física, el juego y el deporte*, (24), 34-62.
- Hervada, B., Maneiro Dios, R., & Revesado Carballares, D. (2022). El aprendizaje cooperativo como estrategia para la enseñanza inclusiva. *Papeles salmantinos de educación*, 26, 261-279. <https://doi.org/10.36576/2695-5644.26.261>
- Kmet, L. M., Lee, R. C., & Cook, L. S. (2004). *Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields*. Alberta Heritage Foundation for Medical Research. <https://doi.org/10.7939/R37M04F16>
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15(2), 155-163. <https://doi.org/10.1016/j.jcm.2016.02.012>
- León-Díaz, O, Martínez Muñoz, L. F., & Santos Pastor, M. L. (2023). Metodologías activas en la Educación Física. Una mirada desde la realidad práctica (Active methodologies in Physical Education. A look

- from practical reality). *Retos: nuevas tendencias en educación física, deporte y recreación*, 48, 647–656. doi.org/10.47197/retos.v48.96661
- Leão Pereira, A. F., & Lorente-Catalán, E. . (2024). Un estudio mixto sobre la satisfacción y frustración de las necesidades psicológicas básicas del alumnado de Educación Física en un centro innovador (A mixed study on the satisfaction and frustration of the basic psychological needs of Physical Education students in an innovative school). *Retos*, 59, 64-74. <https://doi.org/10.47197/retos.v59.104115>
- Martin-Lozano, F., García-Fariña, A., & Jiménez Jiménez, F. . (2024). Aprendizaje cooperativo y entrenamiento en suspensión en Educación Secundaria: Incidencia en las necesidades psicológicas básicas (Cooperative learning and suspension training in Secondary Education: Incidence in the basic psychological needs). *Retos: nuevas tendencias en educación física, deporte y recreación*, 53, 554-562. <https://doi.org/10.47197/retos.v53.101117>
- Méndez-Giménez, A., & Garvía-Medrano, P. M. (2025). Motivational and Social Effects of a Hybridization of Student-designed games + Self-made Material in Physical Education: Efectos Motivacionales y Sociales de una Hibridación de Invención de Juegos+ Autoconstrucción de Material en Educación Física. *Espiral. Cuadernos del Profesorado*, 18(37), 60-74. <https://doi.org/10.25115/ecp.v18i37.10058>
- Méndez-Giménez, A., del Pilar Mahedero-Navarrete, M., Puente-Maxera, F., & de Ojeda, D. M. (2022). Effects of the Sport Education model on adolescents' motivational, emotional, and well-being dimensions during a school year. *European Physical Education Review*, 28(2), 380-396. <https://doi.org/10.1177/1356336X211047866>
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4(1), 1. <https://doi.org/10.1186/2046-4053-4-1>
- Morena, J. M. D., García, D. B., de la Cuerda, R. C., Parra, N. R., Ceña, D. P., Vázquez, D. F., ... & Mateos, M. E. (2024). El uso del sistema PBL a través del estilo de enseñanza de práctica en Educación Física para aumentar la motivación: propuesta didáctica en Educación Secundaria. *Retos: nuevas tendencias en educación física, deporte y recreación*, 55, 419-427. <https://doi.org/10.47197/retos.v55.104124>
- Ochoa-Ávalos, M., Gutiérrez-Higuera, T., Ceballos-Gurrola, O., & Enríquez-Reyna, M. C. (2025). Efectos de la educación física basada en el Modelo de Responsabilidad Personal y Social. Análisis en adolescentes mexicanos. *Sportis. Scientific Journal of School Sport, Physical Education and Psychomotricity*, 11(1), 1-20. <https://doi.org/10.17979/sportis.2025.11.1.10903>
- Osorio, E. M., & Rivero, R. B. (2021). Hacia un proceso de enseñanza-aprendizaje de la Educación Física saludable. *Opuntia Brava*, 13(2), 303-312.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., & Moher, D. (2021). Updating guidance for reporting systematic reviews: development of the PRISMA 2020 statement. *Journal of Clinical Epidemiology*, 134, 103–112. <https://doi.org/10.1016/j.jclinepi.2021.02.003>
- Palau-Pamies, M., García Martínez, S., Ferriz Valero, A., & Tortosa-Martínez, J. (2022). Incidencia del aprendizaje cooperativo en educación física sobre las necesidades psicológicas básicas. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 22(8). <https://doi.org/10.15366/rimcafd2022.88.005>
- Pelegrín, A., Garcés, E., & Cantón, E. (2010). Estudio de conductas prosociales y antisociales. Comparación entre niños y adolescentes que practican y no practican deporte. *Informació psicològica*, (99), 64–78
- Pellicer, E., García Martínez, S., & Ferriz Valero, A. (2021). Necesidades psicológicas básicas asociadas en la práctica de deporte individual y colectivo. *Retos: nuevas tendencias en educación física, deporte y recreación*, 42, 500-506. <https://doi.org/10.47197/RETOS.V42I0.87480>
- Real-Pérez, M., Sánchez-Oliva, D., & Moledo, C. P. (2021). Proyecto África "La Leyenda de Faro": Efectos de una metodología basada en la gamificación sobre la motivación situacional respecto al contenido de expresión corporal en Educación Secundaria (Africa Project "La Leyenda de Faro": Effects of a methodology. *Retos: nuevas tendencias en educación física, deporte y recreación* 42, 567-574. <https://doi.org/10.47197/retos.v42i0.86124>
- Rodríguez, A. C., Valenzuela, A. V., & Martínez, B. J. S. A. (2016). La importancia de la educación física en el sistema educativo. *EmásF: revista digital de educación física*, 43, 83-96.

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American psychologist*, 55(1), 68–78. <https://doi.org/10.1037//0003-066x.55.1.68>
- Sevil Serrano, J., Abós Catalán, Ángel, Generelo Lanaspá, E., Aibar Solana, A., & García-González, L. (2016). Importancia del apoyo a las necesidades psicológicas básicas en la predisposición hacia diferentes contenidos en Educación Física (Importance of support of the basic psychological needs in predisposition to different contents in Physical Education). *Retos*, 29, 3-8. <https://doi.org/10.47197/retos.v0i29.34855>
- Silva, Á. S., & Prieto, J. L. (2021). Hibridación de la Gamificación, la educación física relacionada con la salud y el Modelo Integral de Transición Activa hacia la Autonomía en la iniciación al Crossfit en estudiantes de Secundaria. *Retos: nuevas tendencias en educación física, deporte y recreación*, 42, 627-635. <https://doi.org/10.47197/retos.v42i0.87274>
- Soriano-Pascual, M., Ferriz-Valero, A., García-Martínez, S., & Baena-Morales, S. (2022). Gamification as a pedagogical model to increase motivation and decrease disruptive behaviour in physical education. *Children*, 9(12), 1931. <https://doi.org/10.3390/children9121931>
- Torres, B. J. A., Membrilla, I. N., Pérez, G. P., & Buñuel, P. S. L. (2015). Consecuencias de la motivación en las clases de educación física. *EmásF: revista digital de educación física*, 34, 26-41.
- Trigueros-Ramos, R., Gómez, N. N., Aguilar-Parra, J. M., & León-Estrada, I. (2019). Influencia del docente de Educación Física sobre la confianza, diversión, la motivación y la intención de ser físicamente activo en la adolescencia. *Cuadernos de psicología del deporte*, 19(1), 222-232. <http://dx.doi.org/10.6018/cpd.347631>

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