

## Article

# A-Judo: An Innovative Intervention Programme to Prevent Bullying Based on Self-Determination Theory—A Pilot Study

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**Abstract:** This study aimed to evaluate the effectiveness of an intervention entitled A-Judo Programme for the reduction in bullying and improvement of prosocial behaviour at school, based on the theory of self-determination (SDT). Physical education teachers (PETs) received 20 h of specific training, implementing the programme thereafter in their classes in a total of 10 sessions of 50 min each (two sessions per week over 5 weeks). Variables such as teacher's teaching style, basic psychological needs (BPNs), self-determined motivation, tolerance and respect, moral identity, harassment and victimisation were studied. Seventy-nine students ( $11.13 \pm 0.52$  y) of both sexes (40 girls and 39 boys) participated in the study and were divided into an intervention and a control group (which received no training). The results showed significant changes with moderate to high effect sizes in BPN, motivation, tolerance–respect, moral identity and bullying. These research findings improve the body of knowledge of the applications offered by SDT and its usefulness for improving anti-bullying programmes through PET training.

**Keywords:** motivation; school; well-being; physical education; intervention programme; harassment



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## 1. Introduction

Coexistence in schools is a complex phenomenon that sometimes degenerates into intimidating and violent behaviour that poses a real problem for the health and well-being of students. Despite the prevalence of various forms of violence among school students, bullying has been a major issue since Olweus [1] popularised it in the 1980s after the suicides of some young Norwegians. Its high levels of prevalence [2,3] and the serious consequences for young students around the world make bullying a serious public health problem [4]. Most of the research on this topic has been developed using correlational methodologies defining the construct and analysing the relationships between possible antecedents. However, there have also been studies, albeit to a lesser extent, with experimental methodologies that have demonstrated the effectiveness of many anti-bullying interventions [5]. Although the interventions have been effective to date, they are still insufficient to eradicate the problem from schools. So, specialists in the field urge the continued development of new proposals that address the problem from different perspectives and in a cross-cutting manner, such as the approach of physical education, which this study intends to address.

The consensus among researchers defines bullying as aggressive behaviour that is repeated over time which causes physical, psychological, social or educational harm and in which there exists an imbalance of power between aggressors and victims [6]. Both traditional bullying and cyberbullying carry consequences that severely impact the quality of life of all the agents involved in this phenomenon [7,8] (Garaigordobil 2020; González-Cabrera et al., 2018). Victims suffer from anxiety; depression; school absenteeism; impaired academic performance [9–12]; eating disorders; low self-esteem; loneliness; poor quality of relationships; insomnia; self-harm and suicidal thoughts [13–15], which sometimes materialise. Bullies suffer consequences related to the internalisation of mental health

problems and issues, such as anxiety, depression, psychosomatic problems, increased risk of suicide and future involvement with other forms of violence, and they also risk substance abuse [16–19], which often continues for the rest of their lives [20]. Finally, bystanders sometimes experience distress, anxiety and depression [15].

The interaction between contextual and personal factors as a background to bullying has been identified as a very important aspect in the study of this problem. To this effect, morality, prosocial values, teacher's teaching style and relationships with peers have been shown to have predictive capacity with respect to bullying [21–23]. Thus, researchers specialising in the topic suggest that these variables be included in intervention programmes designed to prevent bullying.

### 1.1. Anti-Bullying Programmes

A recent doctoral thesis [24] has analysed the effectiveness of anti-bullying programmes, pointing out the difficulty of drawing conclusions due to the heterogeneity of methodological designs, the type of programme used or the place of implementation. The results of a recent meta-analysis [5] that analysed 100 different interventions, supported these findings, and suggested that anti-bullying programs reduce bullying perpetration by 19–20% and bullying victimisation by approximately 15–16%. Most of these interventions were developed in the space provided by schools and focus on raising awareness among young people about the characteristics and consequences of bullying, as well as on developing emotional competence and social skills. Considering the effect sizes, the two most effective interventions in preventing perpetration and victimisation were those developed in Spain, with a duration of 19 sessions and 176 ESO students aged 13–15 years [25], and in the United States, with a duration of 16 lessons per week and 323 Caucasian students with an average age of 12.2 years [26]. After analysing the strengths and weaknesses of the most effective programmes, Zych et al. [3] propose that future interventions should generate cultures of peace, set specific standards regarding bullying, measure bullying, consider changes in the school environment and in the curriculum itself, include content for social and emotional competence, encourage peers to help victims, use engaging and active methodologies that promote participation and collaboration, take into account the particular circumstances of each school and ensure that changes are perpetuated over time.

Concerning the field of action, interventions can be carried out at the individual, group, school or society-community level [27]. Although it is recommended to address the problem from a global perspective, through community programmes, this is not always possible. For this reason, the most common interventions are those in schools. Among these, the intervention known as KIVA, created and successfully tested in Finland [28–30], has gained particular popularity and has been developed in other countries, such as Italy and the Netherlands [31,32]. However, teacher-led group interventions have also been effective in preventing perpetration and victimisation by developing social and moral competence (i.e., Bull et al. [33]). In Spain, the education law [34] gives physical education (PE) a special responsibility in the development of social and civic competences, stating that physical activities are an ideal means to facilitate relationships, integration and respect. Thus, physical education teachers (PETs) have a fundamental role within the education system in the development of a peaceful climate, education in values or social and civic skills and competences. These issues seem to be decisive in the fight against bullying. However, among the interventions reported by authors, such as Gaffney et al. [5], only the work developed by Battey [35], in the United States, has implemented the anti-bullying programme in PE classes; even though some authors have pointed out this subject as the ideal environment to work on bullying prevention [36]. In PE, social relationships with peers are different, as there is usually a high component of physical contact. Although this may pose a risk [37], as personal differences arise, and potential victims may be more exposed [38], it is understood that these situations in the hands of trained professionals are ideal for the early detection of bullying and to establish preventive strategies [39]. On the other hand, the subject of PE has been pointed out as the ideal environment to work

with students on the values of moral and social development [40,41], which are positive to prevent bullying. In fact, it has been shown that the absence of these values is among the reasons why some young people assault others. Authors such as Holt/Hale and Persse [42] proposed the development of specific programs to prevent bullying in physical education. Recently, Benítez-Sillero [43] showed the effectiveness of a six-session intervention in PE to reduce bullying behaviours through role-playing and cooperative exercises, aimed at raising students' awareness of bullying, fostering empathy, self-control and empowerment in the face of aggression. Recent works [44] have demonstrated, through several works based on the theory of self-determination [45,46], the relationships between students' motivation towards physical education and bullying behaviour.

### *1.2. Moral Identity, Self-Determination Theory and Bullying*

Among the main criticisms of anti-bullying programmes is that they are only effective for the duration of the intervention, as students reduce the frequency of their bullying by the external control to which they are subjected, resuming such behaviours when that control diminishes. Therefore, as previously mentioned, Zych et al. [18] recommend that interventions should provide strategies that sustain the effects achieved during the intervention over time. In that direction, moral reasoning, understood as a cognitive process that enables people to make morally acceptable decisions in response to specific situations, is an essential contributor in building a better, fairer and safer society [47]. Concerning the elaboration of moral conduct, Reynolds and Ceranic [48] give prominence to moral identity, defining it as a commitment to a sense of self in lines of action that promote or protect the well-being of others [49]. Individuals with a strong moral identity can allow their ethical code to prevail in situations where the context pushes them to transgress it, avoiding the mechanism known as moral disengagement. Moral disengagement is understood as the ability of individuals to justify behaviours that are not acceptable within their own ethical codes and has been shown to be among the main predictors of bullying behaviours [50–52], as shown by recently published meta-analyses [53,54]. Aware of the role of moral identity in preventing young people from triggering bullying behaviour, some authors have shown the importance of generating positive school climates [55,56]. Only a few programmes in Germany [33] have specifically focused on the concept of morality to reduce bullying, and we are not aware of any interventions that have implemented motivational strategies to achieve the internalisation of values, which could contribute to the success of the programme.

To understand people's behaviours, a potential answer may lie in self-determination theory (SDT) [45,57], which has provided a solid theoretical framework to explain human behaviour from its motivations in the different contexts in which it operates. The dogmas of this theory hold that social factors have a decisive influence on the satisfaction of the three basic psychological needs (BPNs; autonomy, competence and relatedness) that all people have to experience health, growth and high levels of well-being. In this way, autonomy is the ability to make decisions freely; competence is the ability to perform certain tasks; and relatedness is the ability linked to the perception of feeling connected, accepted or integrated into a group. SDT postulates that the more satisfied the BPNs are, the more self-determined people's motivations are. Thus, from more to less self-determined, motivations can be intrinsic motivation, extrinsic motivation (integrated, identified, introjected and external regulation) or demotivation. Self-determined motivations (intrinsic, integrated and identified) imply an internal control locus so that people develop certain behaviours to learn, improve and experience stimuli and understand that this behaviour is in line with their personality or identify it as positive. On the other hand, less self-determined motivations (introjected, external regulation or demotivation) are associated with an external control locus. In this case, people develop behaviours to avoid feelings of guilt, to obtain rewards, to avoid punishment or simply without knowing the reason to doubt their usefulness. Finally, SDT states that self-determined motivations lead to adaptive

consequences (behavioural, cognitive and affective), while poorly self-determined ones lead to non-adaptive consequences.

Based on SDT, harassing actions are understood as maladaptive behaviours. Roth and Bibi [58] found that the internalisation of prosocial values, due to the regulation identified, predicted bullying negatively, while the external regulation of those values predicted it positively. Additionally, Goodboy et al. [59] showed that those who suffered bullying in secondary school had lower levels of self-determined motivation and high levels of amotivation, as well as academic, social, emotional and institutional problems in the first semester of university. In contrast, Jungert et al. [60] showed that students who presented higher levels of self-determined motivations towards the behaviour of victim defence helped more in the face of bullying events than students who presented lower levels of self-determined motivations. In line with the assumptions of SDT and the studies cited above, Montero-Carretero et al. [44] showed a predictive model in PE classes in which bullying behaviours were negatively predicted by self-determined motivations and positively predicted by the satisfaction of BPNs. In that study, BPNs were predicted by students' perceptions of the teacher's teaching style, resulting positively in a supportive autonomy style (AS) and negatively in a control style (CS). Autonomy-supportive contexts "involve recognition of the child's feelings, adoption of the child's perspective, justification, choice and minimization of pressure" [61] (p. 656). In contrast, the CS is characterised by attitudes where the teacher is authoritarian, ignoring students' perceptions and pressures to impose a specific and preconceived way of thinking, feeling and behaving [62,63]. Lam et al. [64] recommend the use of AS to promote BPNs in PE, having observed that such a style negatively predicts bullying behaviour, as it is based on meeting the needs of relatedness. Roth et al. [61] observed an inverse relationship between students' perception of AS and bullying behaviour, mediated by the internalisation of peer consideration. In contrast, CS in PE has been associated with frustration of the BPN, harassment and anger [21].

### 1.3. The Current Study

The main objective of the present study was to analyse the effects of an anti-bullying intervention based on SDT in PE classes. The study involved an experimental and control group. The PETs of the experimental group, previously trained, developed an educational unit (EU) of judo against bullying (the A-Judo Programme) using a supportive style and implementing motivational strategies aimed at the promotion of BPNs to sensitise students against bullying and encourage the development of moral identity, tolerance and respect. In the same period, the teachers in the control group developed EUs of other sports without the application of any specific strategy, as they had been doing regularly.

This paper aims to contribute to the research literature in two directions: (a) by trying to fill some existing gaps concerning the issue of bullying through an experimental methodology in the context of the EP; (b) by increasing the body of knowledge of the SDT, applying its postulates to a novel intervention in the educational context.

Based on the work presented above, the following hypotheses were formulated:

After the intervention, students in the experimental group were expected to show significant differences for the control group.

**Hypothesis 1 (H1):** *regarding the support style of physical education teachers: higher values are expected in the perception of a style with AS and lower values in the perception of a CS.*

**Hypothesis 2 (H2):** *regarding the satisfaction of BPNs and motivations towards PE: higher values are expected in the satisfaction of the BPN regarding autonomy, competence and relatedness in the experimental group (hypothesis 2a), as well as in the intrinsic and identified motivations (hypothesis 2b).*

**Hypothesis 3 (H3):** *regarding consequences: higher values are expected in moral identity and tolerance-respect (hypothesis 3a) and lower values in harassment and victimisation (hypothesis 3b).*

## 2. Material and Methods

### 2.1. Design

To assess the effectiveness of the programme, this study employed a pre–post-test quasi-experimental design with two groups: an experimental group, which received the intervention, the A-Judo Programme, and the control group, which did not [65].

#### 2.1.1. Sample and Procedure

Firstly, a random sample selection was made by clusters among the schools in the province of Alicante (Spain). Eight schools were selected, and then, researchers contacted school directors and PET directly to explain the project and ask for their collaboration in it. All of them were informed about the aims of the study, as well as its exclusively scientific and academic purposes. Of these, four schools expressed their willingness to participate, so two of them were established as an experimental group and two as a control group, with students from the same year in both cases.

Once the management of the schools gave their agreement, a written request was sent to the parents and to the Autonomous Secretary of Education for informed consent, which was given (REF. 05ED01Z/2017. 56). After obtaining the necessary permits and authorisations, two PETs from the total without previous knowledge of judo were selected to take part in the experimental group. They received a 20 h pretraining in which they learned to develop the A-Judo Programme with the help of the A-Judo Guide [66]. The training course was given by the main researcher, who is a motivation expert and Judo Master, holding the rank of 6th DAN. The different variables under study were measured immediately before and after the intervention in the experimental group and at equivalent times for the control group. In all schools, data collection was carried out in a classroom during one of the hours set aside for the PE class. Before completing the questionnaire, students were instructed on the importance of being honest in their answers. During the completion of the questionnaires, any doubts that arose were clarified by the subject teacher. The questionnaires were completed in approximately 20 min and in an anonymous manner. The final sample of our study was 92 students, but 79 completed all steps of the research. The average age was 11.13 years ( $SD = \pm 0.52$ ). With regard to the groups, 20 boys and 22 girls were part of the experimental group and 19 boys and 18 girls the control group, distributed in 4 different classes (one per participating school). Figure 1 shows a schematic representation of the study design.

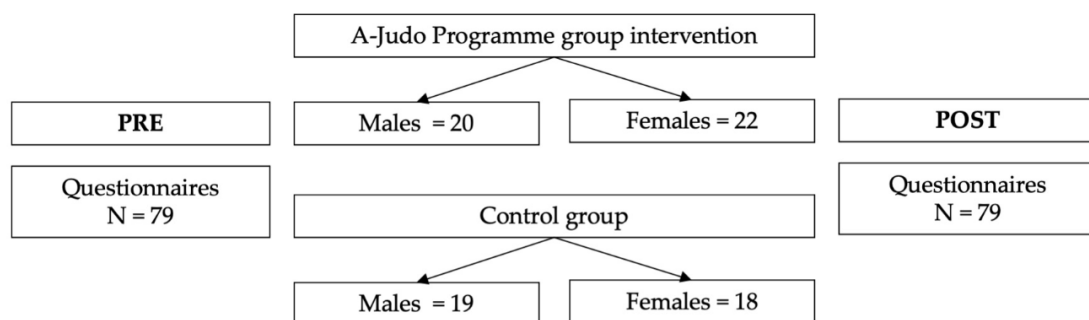


Figure 1. Study design representation.

#### 2.1.2. Intervention: A-Judo Programme

The A-Judo Programme is an intervention specifically designed to prevent the perpetration and victimisation of bullying through an educational unit of judo in PE. The researchers selected judo among the different sports, considering that this sport has been linked to the educational context since its origins [67] and that the etiquette and ceremony (Rehi Shiki) characteristic of this discipline makes it an ideal tool to work on attitudinal and moral aspects [68].



The EU consisted of 10 sessions, two sessions per week of 50 min each, and was given during the time designated for PE classes. The PETs taught the classes by developing motivational strategies based on SDT, consisting of the promotion of BPNs (see Table 1) and using an autonomy style. Additionally, the contents of SDT are aimed at raising awareness among students about bullying, promoting moral identity, tolerance and respect.

**Table 1.** Description of strategies carried out to promote the basic psychological needs.

BPN	Strategies
Autonomy	<ul style="list-style-type: none"> <li>✓ Tasks were proposed in which the students could choose partners with whom to practise, the games, the techniques to be performed and the way to carry them out.</li> <li>✓ The students were asked to give their opinions on their likes and preferences, and they were considered (e.g., teachers asked students which games or exercises from previous sessions they learned and the judo falls they liked best and then proposed only those).</li> <li>✓ Students were positively involved through methodologies such as problem-solving, which allowed them to decide how to solve tactical situations (e.g., the teacher asks students to try to turn the partner when defending himself or herself upside down, and they investigate how to do this efficiently).</li> </ul>
Competence	<ul style="list-style-type: none"> <li>✓ Achievable goals were set for the level of the students (judo beginners).</li> <li>✓ Progression in learning was made (e.g., falls were taught first, then projection techniques).</li> <li>✓ Each student received positive reinforcement after a correct performance (at least twice in each session). This process was controlled through an observation template completed by one of the researchers.</li> <li>✓ Technical feedback was provided continuously.</li> <li>✓ The PETs demonstrated competence, clearly explaining the objectives, justifying the teaching methodology used and demonstrating the techniques previously learned.</li> </ul>
Relatedness	<ul style="list-style-type: none"> <li>✓ Information was provided on the values implicit in the practice of judo, rooted in its historical and cultural origins: respect for the degree, for the opponent, tolerance of differences and errors, self-control, courtesy, cooperation and tenacity.</li> <li>✓ The PETs behaved in an affective and close way with the students, considering the problems that could arise during the development of the sessions.</li> <li>✓ The PETs participated with the students in some exercises and games.</li> <li>✓ Cooperative work was proposed (e.g., drawing a group picture with the judo belts related to tolerance–respect for diversity).</li> <li>✓ Methodologies were used in which some students taught and helped others (e.g., in the pre-assessment preparation session).</li> </ul>

Note: BPN = basic psychological need; PET = physical education teachers.

All sessions consisted of a warm-up, a main part and a return to calm. A brief description of the content of each session of the A-Judo Programme is given in Table 2. From a methodological point of view, group dynamics, brainstorming, debates, guided discussions based on the questions posed by the PET after watching the videos, role-plays, critical reflections or case studies were integrated, as previous studies have demonstrated a high degree of effectiveness [25,26,69]

For the development of the educational unit, the schools were equipped with a tatami (the surface where judo is practised), and each student used a judogi. The research team made sure that the characteristics of the room and the tatami were adequate for the development of the classes in safe conditions. During the development of the EU, the teachers could contact the research team to ask for help, although none of them did so. Additionally, regular meetings between the research team and the PETs were scheduled every 4 sessions to ensure the smooth running of the programme. The sessions were videotaped and monitored by the researchers to ensure that the EU was conducted within the agreed guidelines.

**Table 2.** Description of the content of each session of the A-Judo Programme.

Warm part (10 min)	Judo greeting, teachers explained the objectives of the session and some theoretical concepts (e.g., basic judo rules), low or moderate-intensity game or exercise to gradually get the body up to the level of the activity.
Main part (30 min)	Exercises, games or traditional judo training activities to work on the main contents of the session (e.g., the forward breakfall or the immobilisation on the ground). Collaborative tasks are proposed so that students achieve a common goal (for example, performing a projection technique in pairs where uke practices his fall and tori the development of the three phases of the movement: imbalance, preparation and projection). Opposing tasks are also proposed (e.g., randori on the floor).
Return to calm (10 min)	A low-intensity game or exercise for cooling down and a reflection time. Pupils, together with their teachers, establish links between what they have worked on in the PE class and situations related to bullying that may occur in other spaces (for example, after playing a game in which two pupils fight against one on the floor, the imbalance of power that occurs when several pupils bully one in the school playground is raised).

Note: uke = judoka who receives the action; tori = judoka who executes the action; immobilisation = technique in which a student tries to hold another student upside down; randori = training method in which one struggles with another to achieve the same goal.

## 2.2. Measures

This section presents the instruments used to measure all the variables of the study, which were measured twice (pre- and post-intervention).

*Teachers' Supportive Style.* We employed the Scale of Perception of Supportive Style in Physical Education Classes, validated to the Spanish context by Montero-Carretero and Cervelló [23]. This scale is an adaptation of the Multidimensional Perceived Autonomy Support Scale for Physical Education (MD-PASS-PE) of Tilga et al. [70] to measure AS and part of the Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ-C) of Appleton et al. [71] to measure CS. It consists of 19 items grouped into 4 factors [23]: (a) organisational support autonomy (5 items), (b) procedural support autonomy (5 items), (c) cognitive support autonomy (5 items) and teacher's CS (4 items). Responses are rated on a seven-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree).

A general measure of AS can also be calculated, which is recommended when performing mathematical prediction processes [70] to avoid problems of collinearity and variance inflation.

*Basic Psychological Needs.* The Spanish version of the basic psychological needs in Exercise Scale [72], adapted to the context of PE by Moreno et al. [73], was used. The scale was preceded by the following statement: "In the subject of physical education..." and was composed of 12 items, 4 for each of the factors: autonomy, competence and relatedness. Responses were rated on a five-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree).

*Motivation.* To measure students' self-determined motivation, the physical education motivation questionnaire (CMPE) validated by Sánchez-Oliva et al. [74] was used. This scale is composed of the following stem phrase: "I participate in physical education classes . . ." followed by 20 items that analyse the five factors: intrinsic motivation, identified regulation, introjected regulation, external regulation and amotivation. Participants had to express their degree of agreement on a five-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree).

*Moral Identity.* The moral identity factor of the Ethnic and Moral Identity Scale (EMIS) by Aldridge et al. [55] was used. This scale was validated by Montero-Carretero and Cervelló [75] for the Spanish context. The scale is composed of a previous sentence, "At school...", and 8 items that refer to the moral identity of the students, with answers formulated on a Likert scale whose values range from 1 (almost never) to 5 (almost always).

*Tolerance-Respect.* To measure tolerance and respect for peers, the scale on the development of positive behaviours in PE classes from the Positive Behaviour Questionnaire in Physical Education (CCPEF: (García-Calvo et al. [41])) was used. This instrument is composed of the initial phrase, "In physical education classes...", followed by 4 items presented

in a dichotomous way, which analyse tolerance and respect for peers. The participants indicate their degree of agreement with the question asked through a Likert-type scale with five options, where 1 corresponds to “totally agree” with the negative sentence, and 5 corresponds to “totally agree” with the positive sentence.

*Bullying.* The Spanish version of the European Bullying Intervention Project Questionnaire (EBIP-Q) of Ortega-Ruiz et al. [76] was used to measure this variable. This scale includes two factors, which reflect bullying victimisation and bullying perpetration, with 7 items each. Students were asked to indicate how often they performed or suffered bullying behaviours in the past two months. The student must answer them on a five-point Likert scale, as follows: 1 (No), 2 (yes, once or twice), 3 (yes, once or twice a month), 4 (yes, about once a week) to 5 (yes, more than once a week).

### 2.3. Data Analysis

Descriptive statistics were expressed as the mean (M) and standard deviation (SD). Reliability was assessed by Cronbach’s alpha calculation, considering scores over 0.70 to be acceptable [77]. The change in the level of the variables was analysed using one-way ANCOVA. We introduced the pre-intervention scores as covariables. The post-intervention scores were introduced as the dependent variables. The group intervention (experimental versus control) was the fixed factor. This approach allows a fundamental question in our design, which is to equalise the groups concerning the value of the covariate [78]. This aspect is especially necessary when analysing groups that may not be homogeneous in some variables that, although they were not analysed in our study, may influence the results (note that our students belong to different schools).

The marginal means and the standard error, significance level and size effect were considered (partial eta-square ( $\eta_p^2$ )), as a practical significance of ANCOVA with the following interpretation:  $>0.26$ , between 0.26 and 0.02 and  $<0.02$  were considered as large, medium and small, respectively [79]. All data in this study were analysed using the Statistical Package for Social Sciences (Version 24.0 for Windows, SPSS Inc., Chicago, IL, USA). Statistical significance was set at an alpha level of  $p < 0.05$ .

## 3. Results

### 3.1. Descriptive Statistics and Reliability

The descriptive statistics and reliability tests (Table 3) showed the evolution in the measures under study between the means before and after the intervention period, in addition to acceptable values for all factors in terms of reliability.

**Table 3.** Descriptive statistics for control and intervention groups and reliability for the total sample, pre- and post-intervention.

	Pre			Post		
	$\alpha$	M	SD	$\alpha$	M	SD
Autonomy Support	0.90	4.65	1.13	0.94	5.06	1.32
Control Style	0.71	2.75	1.33	0.70	2.32	1.20
Autonomy	0.81	3.35	0.87	0.77	3.46	0.97
Competence	0.85	3.94	0.83	0.86	4.02	0.87
Social Relationships	0.86	4.13	0.90	0.91	4.17	0.99
Intrinsic Motivation	0.84	4.30	0.69	0.84	4.07	0.89
Identified Motivation	0.70	4.23	0.66	0.85	4.01	0.89
Introjected Motivation	0.68	3.03	1.07	0.79	2.88	1.15
External Motivation	0.79	3.47	1.05	0.84	1.53	0.81
Amotivation	0.70	1.69	0.86	0.76	1.53	0.81
Moral Identity	0.86	3.98	0.79	0.87	4.13	0.74
Tolerance–respect	0.83	3.83	1.01	0.73	4.02	0.88
Victimization	0.79	1.62	0.68	0.80	1.67	0.71
Bullying	0.79	1.28	0.45	0.79	1.23	0.37



### 3.2. Covariance Analysis

The calculated ANCOVA (Table 4) shows significant differences in most variables. Specifically, the intervention group showed, with respect to the control group, higher and significant levels of perception of autonomy support by the teacher; satisfaction of basic psychological needs of autonomy, competence and social relations; intrinsic motivation, identified and introduced; moral identity; and tolerance and respect. The effect sizes were between moderate and high ( $\eta_p^2$  between 0.06 to 0.480). On the other hand, the intervention group showed significantly lower levels of teacher perception of a control style, external motivation and bullying. The effect sizes were also moderate in this case ( $\eta_p^2$  between 0.06 to 0.07).

**Table 4.** Values of the univariate covariance analysis for the variables studied.

Variables	Marginal Means $\pm$ SE		F	Sig.	$\eta_p^2$
	Control	Intervention			
Autonomy Support	3.79 $\pm$ 0.19	5.70 $\pm$ 0.14	67.19	0.000	0.48
Control Style	2.75 $\pm$ 0.21	2.15 $\pm$ 0.15	5.38	0.023	0.07
Autonomy	2.81 $\pm$ 0.15	3.79 $\pm$ 0.11	27.68	0.000	0.27
Competence	3.64 $\pm$ 0.13	4.23 $\pm$ 0.09	14.57	0.000	0.16
Social Relationships	3.70 $\pm$ 0.16	4.42 $\pm$ 0.11	13.46	0.000	0.15
Intrinsic Motivation	3.54 $\pm$ 0.15	4.35 $\pm$ 0.10	19.63	0.000	0.21
Identified Motivation	3.46 $\pm$ 0.14	4.29 $\pm$ 0.10	21.68	0.000	0.22
Introjected Motivation	2.48 $\pm$ 0.22	3.07 $\pm$ 0.16	4.63	0.035	0.06
External Motivation	1.82 $\pm$ 0.16	1.39 $\pm$ 0.11	4.89	0.030	0.06
Amotivation	1.72 $\pm$ 0.15	1.44 $\pm$ 0.10	2.20	0.142	0.03
Moral Identity	3.80 $\pm$ 0.12	4.30 $\pm$ 0.08	11.15	0.001	0.13
Tolerance–respect	3.64 $\pm$ 0.15	4.20 $\pm$ 0.11	8.83	0.004	0.10
Victimization	1.66 $\pm$ 0.11	1.65 $\pm$ 0.08	0.001	0.971	0.00
Bullying	1.34 $\pm$ 0.06	1.17 $\pm$ 0.04	4.78	0.032	0.06

## 4. Discussion

The main objective of the study was to analyse the effectiveness of the A-Judo Programme in preventing bullying. The results show significant differences in favour of the experimental group compared to the control group, regarding the study variables measured after the intervention. The results are discussed hereafter considering the previously formulated hypotheses.

In favour of hypothesis 1, the students in the experimental group perceived higher AS and lower CS than the control group. The results are satisfactory since the methodology of the A-Judo Programme considers that the teaching staff are close to the students, receptive to their ideas, tastes and proposals and provide abundant positive and affective feedback during the classes. So, this is approaching an interpersonal style of AS and is moving away from CS. The interpersonal style of AS has presented inverse relationships with bullying [61], and in PE, they have already positively predicted satisfaction with BPNs [44], while CS-based styles have positively predicted frustration [19].

BPNs are universal and essential to people's health and well-being [46,57], and their satisfaction leads to more self-determined motivations. Therefore, another objective of the A-Judo Programme was to promote the satisfaction of students' BPNs (see Table 4). The results showed significant post-intervention differences in favour of the experimental group versus the control group in the satisfaction of autonomy, competence and relatedness, thus confirming hypothesis 2a. In this way, our results show significant differences in the values of post-intervention self-determined motivations between the experimental and

control groups. This indicates that students who participated in the *A-Judo Programme* increased their intrinsic motivation towards the subject of PE as well as their interest in learning, improving their skills or the search for stimulating sensations that the practice arouses. Based on the increases in the identified motivation, it could be understood that the students who participated in the programme positively valued what they had learned and worked on during the programme, considering it useful for their lives, thereby confirming hypothesis 2b. This could be a determining factor for the success of the intervention, whose objectives and contents are aimed at generating sensitivity towards bullying and increasing students' emotional and social competences through judo. Roth and Bibi [58] showed the importance of internalising prosocial values to prevent bullying through identified regulation, while Montero-Carretero et al. [44] already showed that self-determined motivations in PE negatively predicted the perpetration of bullying and victimisation. Unexpectedly, in our study, the experimental group showed significantly higher values of introjected regulation after the intervention than the control group. Even though this motivation is weakly self-determined, it is reasonable to think that students who identify what they learn in the programme as positive feel bad if they do not attend the programme, obtaining a high score on the items that measure introjected regulation as well. This result does not seem to be unsatisfactory for the programme, also considering that the values obtained in the external regulation were as expected.

In line with SDT postulates, where self-determined motivations lead to adaptive consequences [46,57], our results show significant post-intervention differences in favour of the experimental group in moral identity and tolerance-respect, thus confirming hypothesis 3a of this study. This programme, applied in PE classes, seems to increase students' commitment to themselves to promote the well-being of others, accepting and respecting people, regardless of their differences and peculiarities. As mentioned above, many authors have pointed out that PE is an ideal tool for moral and social development [40,41] through the positive model of the teacher and activities in which students cooperate and learn the intrinsic value of sport [80]. Bull and others [33] have already demonstrated the effectiveness of anti-bullying programmes through morality. In this regard, Montero-Carretero and Cervelló [75] showed how moral identity negatively predicted bullying behaviour in a study where teacher support, peer connection and affirmation of diversity were shown to be critical to the development of moral identity. Hypothesis 3b can be partially confirmed, as significantly lower levels of bullying were obtained in the experimental group, but the differences in victimisation were not significant after the intervention. According to this result, the *A-Judo Programme* appears to be effective in reducing bullying but shows weaknesses concerning victimisation behaviour. These results coincide with those obtained by Gaffney et al. [5] who showed that programmes tend to be more effective in preventing perpetration than victimisation. The *A-Judo Programme*, also developed in PE classes [66] and whose main objective was to reduce victimisation, succeeded in raising awareness about bullying and increasing perceived social support, but the authors of this work highlight the need for programmes to change the curriculum and combat bullying with PE, in line with others who point to the special responsibility that PETs may have in combating bullying [39].

In line with the above idea, it seems necessary that PETs receive specific training to help them prevent bullying by increasing their knowledge of this phenomenon, knowing the possibilities that the different sports disciplines can offer and the appropriate methodologies to be implemented. From a methodological point of view, in the *A-Judo Programme*, it was considered fundamental to promote reflections that link the contents of judo with bullying, moral identity, tolerance and respect. Although the final phase of the session was considered the right time to work on group reflection, reflections emerged at different times of the session, sometimes carried out right after an exercise, in the main part of the warm-up (for example, after the immobilisation students reflected on the anguish that someone may experience in the schoolyard when he or she feels cornered or on whether individual differences justify harassing someone or assaulting him or her in some way).

Establishing the link between what happens in the physical education classroom and what happens in other spaces was considered highly relevant to ensuring the effectiveness of the programme.

Although the results of our intervention are satisfactory, the study is not free of limitations. It seems highly advisable to review methodological issues of the A-Judo Programme to increase its effectiveness. First, increasing the duration, considering that the programme was composed of 10 sessions, while other more effective ones offered between 16 and 19 sessions [25,26], could contribute to the success of the programme. Second, implementing specific strategies for resilience building could help to improve victimisation prevention, considering the results of Montero-Carretero and Cervelló [75], where resilience negatively predicted victimisation, and those of Montero-Carretero and Cervelló [23], where resilience already mediated the relationships between AS in PE and victimisation. Third, considering the small sample size of the present study, future research should test the effectiveness of the programme by increasing the number of participants to analyse whether effect sizes on measured variables are increased. Fourth, no retest was carried out. Along this line, the authors suggest that it would be advisable to carry out longitudinal designs in which post-intervention retest measures are carried out far from the end of the programme and before the end of the academic year to analyse whether the effects of the programme are maintained over time. Fifth and last, this study only took into consideration the evaluation of students, without considering other agents involved. In this line, the authors of this paper suggest considering teachers as an important element when assessing the effectiveness of an intervention programme of these characteristics.

However, despite these limitations, the results of this study regarding self-determined motivations and the detriment of bullying behaviours seem to indicate that the reasons students in the experimental group decreased their bullying behaviours were internal and not due to obtaining rewards or avoiding punishment, as could have been the case in other programmes [58]. This could be very relevant for increasing student adherence to the programme as well as helping to perpetuate the effects of the programme beyond the duration of the programme, as recommended by Zych et al. [18]. Future studies should analyse these aspects.

## 5. Conclusions

The A-Judo Programme was proven to be a useful method in PE classes to prevent bullying directly, as well as to positively influence other variables related to bullying, such as students' moral identity, tolerance and respect for peers, through judo. The results of this study are in line with SDT and provide useful information for those professionals interested in implementing motivational strategies in other programmes in the hope of increasing BPN satisfaction and self-determined learner motivations to achieve more adaptive consequences.

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