

1 **The Effects of Modifying Contact, Duration, and Teaching Strategies**
2 **in Awareness Interventions on Attitudes Towards Inclusion in Physical**
3 **Education**

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13 This quasi-experimental study analyses the effects of an awareness intervention
14 programme with five different branches. It was designed to improve the attitudes
15 of physical education (PE) students towards the inclusion of classmates with
16 disabilities. The contact (yes/no) and its frequency ($\times 1$ vs. $\times 3$) with para-athletes,
17 the duration of the programme (1 vs. 6/7 sessions), and the provision of teaching
18 strategies and materials (yes/no) were manipulated. The study involved 603
19 students aged 14–19 (15.95 ± 1.09 yrs.) from five public educational centres in
20 southern Spain. Five PE teachers were recruited to deliver the intervention
21 alternatives. Attitudes were assessed pre- and post-intervention (1 to 4 weeks
22 depending on the programme option) with the Spanish version of the Children's
23 Attitude towards Integrated Physical Education (general and specific subscales)
24 and the Scale of Attitudes towards Students with Disabilities in Physical
25 Education. The three groups having contact with para-athletes during the
26 interventions improved in the three attitude variables ($p < 0.05$; $-0.20 < d < -0.24$).
27 Pairwise comparisons of the improvement ratios also revealed several positive
28 effects of the intervention duration and provision of teaching strategies ($p < 0.05$; $-$
29 $0.07 < d < 0.18$). These findings could assist PE teachers in educating students to
30 improve their knowledge and attitudes towards people with disabilities, having
31 different strategies and resources to conduct awareness interventions based on
32 para-sports in their regular PE classes.

33 Keywords: special education needs; Paralympics, disability; para-sport; physical
34 education

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39 **Introduction**

40 Ensuring equal opportunities at all levels of an inclusive education system and lifelong
41 learning represents the achievement of educational rights for persons with disabilities
42 (United Nations, 2009). The inclusive education concept is defined as “an ongoing
43 process aimed at offering quality education for all, while respecting diversity and the
44 different needs and abilities, characteristics and learning expectations of the students
45 and communities” (UNESCO, 2008, p.18). Inclusive education promotes friendships
46 among students with and without disabilities as well as improving adolescents’ socio-
47 moral competencies (Grütter, Gasser, & Malti, 2017). Within the Spanish educational
48 system, students with special education needs (i.e., hearing, visual, physical, or
49 neurodevelopmental disorders), represent 2.3% of the students included in general
50 education schools (MEFP, 2019), increasing to 2.7% in the region where this study was
51 conducted.

52 From a social learning point of view, attitudes can be understood as the result of
53 the interaction between personal-, environmental-, task- or activity-specific factors;
54 each contribute to behavioural intentions and ultimately to the resulting behaviour
55 (Ajzen, 1991). Attitudes toward students with disabilities are considered a key factor for
56 inclusion (Armstrong, De Boer, Pijl, & Minaert, 2014). Interventions aimed at
57 increasing children’s disability awareness within mainstream classrooms can help
58 improve knowledge, attitudes, and acceptance of people with disabilities (Columna,
59 Lieberman, Arndt, & Yang, 2009; McKay, Block, & Park, 2015). There have been a
60 wide variety of formats of disability awareness interventions, including providing
61 information about disabilities, videos, drama, theatre and puppet shows, discussions,
62 stories, simulations, structured interactions, and classroom activities, amongst others
63 (Lindsay & Edwards, 2013). Because PE classes present an opportunity for improving

64 student attitudes towards and knowledge of individuals with disabilities, sports-based
65 inclusive awareness programmes in PE should be promoted to foster better relationships
66 (Campos, Ferreira, & Block, 2014).

67 Lindsay and Edwards (2013) conducted a systematic review to develop
68 recommendations for designing programmes aimed at changing attitudes toward
69 disabilities, knowledge of disability, and acceptance of peers with disabilities. These
70 authors classified the type of interventions based on: (1) social contact, where children
71 are exposed to a person with a disability; (2) simulation-based interventions, where
72 students experience how it would be to have a disability; (3) curriculum-based
73 interventions; (4) multi-media curriculum using videos to explain para-sports; and (5)
74 multi-component interventions, combining the abovementioned strategies. This study
75 combines four of these strategies to improve attitudes toward people with disabilities in
76 PE settings:

77 (1) *Contact with People with Disabilities*. According to Allport's Contact Theory
78 (1954), under the right conditions (i.e., equal status, cooperation, common goals,
79 and support from authority), contact with people different from oneself will lead to
80 an attitude change. Allport theorized that as people encounter others different from
81 themselves, their prejudiced ideas would diminish as they come to understand the
82 other person (McKay, 2018). Several studies conclude that sharing PE sessions
83 with a student/person with a disability creates positive attitudes towards inclusion
84 of students with disabilities (Liu, Kudlacek, & Jesina, 2011; McKay, Block, &
85 Park, 2015). Both direct (i.e., interacting personally with an 'in-group' peer with a
86 disability) and indirect (i.e., knowing an 'in-group' member who has some
87 relationships with an 'out-group' member with a disability; imagining a positive
88 interaction with a person with a disability; or being exposed to out-group members

89 through their portrayal/testimony or interview in media such as video) contact is
90 effective at improving children's attitudes toward individuals with disabilities
91 (Armstrong, Morris, Abraham, & Tarrant, 2017). A well-structured interaction
92 would help students with disability experience successful inclusion at school, such
93 as being perceived as members of the class, interacting with peers, and feeling part
94 of the group (Reina, Hutzler, Iñiguez-Santiago, & Moreno, 2019). Pettigrew and
95 Tropp (2006) stated that when participants experience carefully structured contact
96 situations where Allport's four conditions are met, the positive benefits of
97 intergroup contact are enhanced.

98 (2) *Simulation as an Awareness Strategy for Inclusion*. Disability simulation activities
99 are often designed and implemented by outsiders (e.g., physical educators without
100 impairments) to reflect the experiences of insiders (e.g., PE students with
101 impairments) (e.g., Leo & Goodwin, 2016). This teaching strategy has received
102 some criticism because the insider perspective is omitted from the design, or it
103 assumes that individuals without impairments will acquire meaningful insights into
104 the lives of insiders by participating in temporally short and contrived activities
105 (Leo & Goodwin, 2014). However, there are some PE studies where simulations
106 contributed to improving students' attitudes towards inclusion (Reina, López,
107 Jiménez, García-Calvo, & Hutzler, 2011; Campos et al, 2014; McKay et al., 2015;
108 Pérez-Torralba, Reina, Pastor-Vicedo, & González-Villora, 2019).

109 (3) *Duration of Curriculum-based Interventions*. According to Lindsay and Edwards
110 (2013), there is no clear recommendation for best practices using a curriculum-
111 based intervention to influence attitudes towards children with disabilities. When
112 designing awareness programmes to improve the inclusion process, the duration of
113 the intervention represents a variable to consider (Brown, Ouellette-Kuntz,

114 Lysaght, & Burge, 2011). For example, the Paralympic School Day (PSD),
115 developed by the International Paralympic Committee (IPC, 2006), is a programme
116 to raise awareness and understanding in schools about persons with disability while
117 promoting a platform for attitude change (McKay, 2013). Participants interact with
118 and purposefully learn from para-athletes, varying their perceptions from otherness
119 (e.g., physical limitations or inferiority) to similarities between the athletes and
120 themselves (McKay, Haegele, & Block, 2018). In PE contexts, few studies have
121 implemented the PSD as a single-day activity to influence children's attitudes
122 through a range of Paralympic activities (Liu et al., 2011; Panagiotou, Evaggelinou,
123 Doulkeridou, Mouratidou, & Koidou, 2008; Xafopoulos, Kudláček, &
124 Evaggelinou, 2009). Other studies have implemented interventions lasting from 2-
125 session/1-week (Campos et al., 2014; Obrusniková, Válková, & Block 2003) to 6-
126 session/3-weeks (Reina et al., 2011; Pérez-Torralba et al., 2019). To the best of the
127 authors' knowledge, only the study by Reina et al. (2011) analysed how the
128 duration of the programme (including contact) might lead to an improvement in
129 attitude. Though some studies have proposed periods from a two-hour intervention
130 (e.g., Krahé & Altwasser, 2006) to a twenty-session programme (Slininger, Sherrill,
131 & Jankowski, 2000), there does not seem to be a consensus as to how long the
132 programme/contact has to be for an effective attitude change intervention.

133 (4) *Teaching Resources to Deliver Awareness Interventions*. Multi-media interventions
134 (i.e., presentations, movies, and/or class activities) are effective in improving
135 attitudes towards peers with disabilities (Lindsay & Edwards, 2013). Besides,
136 Kurniawati, de Boer, Minnaert, and Mangunsong (2017) found that teaching
137 strategies (e.g., peer support or cooperative learning) of regular schoolteachers play
138 a key role in realizing inclusive education. Hutzler, Maier, Reuker, and Zitomer

139 (2019) also identified some factors that practitioners should be aware because of its
140 potential influence in the inclusion process, including their professional and
141 academic training toward inclusion, or school environmental factors such as a
142 process rather than performance orientation.

143 This study aims to discern an optimal combination of factors to build an
144 effective awareness programme to improve attitudes towards inclusion in PE students.
145 Curriculum-based activities using simulation in the PE students' natural settings were
146 used, and the following variables were manipulated: (a) the contact (and its frequency)
147 with para-athletes during a para-sport based educational intervention; (b) the duration of
148 the programme; and (c) the provision of teaching strategies and materials for the
149 students. Combining these variables, five branches of the awareness programme were
150 designed and implemented in five different educational centres. Consequently, it was
151 hypothesised that (1) contact during the awareness interventions would improve their
152 attitudes towards peers with disabilities in PE more than those without contact; (2)
153 longer interventions in terms of both duration and frequency would improve attitudes to
154 a greater extent; and (3) using teaching strategies and materials for the students would
155 positively affect the attitudes towards inclusion.

156 **Method**

157 *Participants and Settings*

158 A convenience sample of 603 PE students from five educational centres took part in this
159 study (see Table 1). All the centres were public and located in suburban areas in the
160 southeast region of Spain. They were selected on the basis of (a) permission received by
161 the education board; (b) proximity to the research group and para-athletes; and (c) the
162 commitment of the PE teachers to deliver the whole intervention in their natural school
163 setting. Depending on their assigned group, students received between two to seven

164 lessons in their compulsory PE classes (twice a week), with a duration of 55 min per
 165 session. When the study was conducted, no students with disabilities were enrolled in
 166 any of the 21 PE classrooms where the programme was delivered. The programme
 167 alternatives were implemented in cooperation with three female and two male teachers,
 168 aged 30–49 years (41.80 ± 8.70 yrs.) and with a PE teaching experience of 8–23 years
 169 (16.80 ± 7.19 yrs.).

170 **Table 1.** Descriptive data for the five natural groups in this study.

Group	N	Boys		Girls	
		N	Age	N	Age
Group 1 (CAS+ISC)	125	66	15.76 ± 1.12	59	15.83 ± 1.04
Group 2 (CAS+PDS)	122	71	15.48 ± 1.00	51	15.27 ± 1.11
Group 3 (PDS)	113	62	16.58 ± 0.84	51	16.35 ± 1.11
Group 4 (CAS)	103	48	15.92 ± 0.90	55	16.00 ± 1.24
Group 5 (CG)	140	68	16.06 ± 0.88	72	16.24 ± 1.03

171 CAS = Curriculum Awareness Sessions; ISC = Inside-Session Contact; PDS =
 172 Paralympic Day Session; CG = Control Group

173

174 ***Study Design***

175 This quasi-experimental study used a pre-post design, with five natural groups. The
 176 awareness intervention programme consisted of five alternatives based on the following
 177 factors: (1) contact with para-athletes during the intervention; (2) the duration of the
 178 awareness programme; and (3) using teaching strategies such as videos and infographic
 179 materials (see Figure 1). Three Paralympic sports were used in the design of the
 180 intervention options: boccia, five-a-side football (for blind and visually impaired
 181 athletes), and sitting volleyball. To find the optimal combination of factors, the authors
 182 designed five specific interventions (i.e., levels of the independent variable, and one per

183 educational centre; see Table 2): (1) Curriculum Awareness Intervention (CAS) +
 184 Inside-Session Contact (ISC); (2) CAS + Paralympic Day Session (PDS); (3) PDS; (4)
 185 CAS; (5) Active Control Group (ACG). The specific interventions were randomly
 186 allocated to the five physical educators.

187 **Table 2.** Description of the awareness and information techniques used.

Group	Sessions	Contact with para-athlete	Materials for students	Intervention structure
CAS+ISC	7	Yes (×3)	Yes	- Session 1: pre-test + videos. - Two sessions per para-sport (sess. 2-to-7) - Contact with para-athletes in sessions 3, 5 and 7.
CAS+PDS	8	Yes (×1)	Yes	- Session 1: pre-test + videos. - Two sessions per para-sport (sess. 2-to-7) - Session 8: Paralympic Day with three playing areas (one per para-sport) and having contact with the para-athlete for 15 min each.
PDS	2	Yes (×1)	Yes	- Session 1: pre-test + videos. - Session 2: Paralympic Day with three playing areas (one per para-sport) and having contact with the para-athlete for 15 min each.
CAS	7	No	Yes	- Session 1: pre-test + videos. - Two sessions per para-sport (sess. 2-to-7)
CG	6	No	No	- Two sessions per para-sport (sess. 1-to-6)

188 CAS = Curriculum Awareness Sessions; ISC = Inside-Session Contact; PDS = Paralympic Day
 189 Session; CG = Control Group

190

191 ***Procedures***

192 Before the beginning of the study, ethical approval from the principal investigator's
 193 home university was granted. Afterwards, the researchers contacted the five PE teachers
 194 to obtain their consent to participate in the study and explain the specific intervention
 195 they would implement during their regular PE classes. The schools and the institutions

196 granted the necessary permissions, and informed consent letters were sent/given to
197 students and their parents for approval.

198 Four of the five PE teachers were trained together across three sessions before
199 the programme implementation. First, teachers watched two videos about the highlights
200 and legacy of the London Paralympic Games. Then they were asked several questions
201 to discuss what they thought after watching the videos (e.g., *'Do you think the athletes*
202 *of the video had a good PE experience when they were at school?'*). After intervention
203 assignments, the teachers could share their thoughts about which one they could
204 develop at their educational centres. After a self-reflection, the second session consisted
205 of explaining to them every detail about each intervention (see Table 2) and double-
206 checking that they were able to implement it (e.g., schedule, facilities and equipment
207 availability, students' profile, participating para-athletes). When all this information was
208 clear, the four teachers received guidance specifically designed for every type of
209 intervention the investigators had previously prepared. Sessions also detailed the
210 motivational strategies to be used during interventions to promote a task-involving
211 climate (Ames, 1992), that is, TARGET: (a) Tasks and activities (e.g., cooperative
212 games); (b) Authority (i.e., letting students make their own decisions); (c) Recognition,
213 punishment, and rewards (i.e., equal participation and feedback); (d) Group (i.e.,
214 flexible and heterogeneous grouping); (e) Evaluation (i.e., considering personal
215 progress); and (f) Time (i.e., giving opportunities and time to progress). During the third
216 session, they shared their reflections about the designs (e.g., specific equipment and
217 logistics required to deliver the programme), and the teachers helped to define details
218 about the awareness lessons (e.g., weekly schedule to ensure the contact with the para-
219 athletes). The fifth teacher led the ACG and as such did not participate in the training
220 sessions. Instead, this PE teacher received only the six-sessions awareness programme

221 to implement with the students (i.e., no videos or infographics, nor contact with para-
222 athletes), but was supported by the research staff during its implementation.

223 The questionnaires were given to the participating students before (pre-test) and
224 after (post-test) the corresponding intervention, a period lasting from a minimum of two
225 to a maximum of four weeks (see Table 2). The students' anonymity was guaranteed by
226 a codifying system designed by the authors in collaboration with the PE teachers.
227 Before starting each intervention, each PE teacher (except the one for the ACG) applied
228 the introductory session. This first session included the pre-test, two videos about the
229 Paralympic Games (i.e., 'Sport Doesn't Care Who You Are' and highlights of a
230 Paralympic Games), several questions related to each video (e.g., *'What disabilities do*
231 *you think the athletes that appear on the video have?'*) to work within the awareness
232 process, an infographic flyer for each student with the essential information of each of
233 the three Paralympic sports used for the interventions, and three explanatory videos
234 about each para-sport (boccia, sitting volleyball, and football five-a-side). All the
235 information and documents related to the study implementation can be located at Figure
236 1 (access to each supplementary material requires a QR Code Scanner).



237

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Figure 1. Multimedia and teaching tasks used during the interventions.

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240 ***Measurements***

241

Two questionnaires with inverse items were used to assess the attitudes of PE students

242

towards the inclusion of peers with disabilities. First, the Children's Attitude towards

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Integrated Physical Education–Revised (CAIPE-R; Block, 1995), translated and

244 validated to the Spanish (CAIPER-S) context by Ocete, Pérez-Tejero, Franco, and
245 Coterón (2017). The CAIPER-S includes a description of a student with a visual
246 impairment and a vignette representing her/his participation in PE (i.e., a blind person
247 requiring a stick for orienteering her/himself in the space), followed by six statements
248 about her/his inclusion in the PE classroom (e.g., *'It would be nice to have*
249 *María/Carlos in physical education class'*) and four statements regarding possible
250 adaptations in team sports (i.e., football) that would promote the inclusion of this
251 student (e.g., *'María's/Carlos's goals may score two points'*). Participants express their
252 level of agreement or disagreement with each statement on a four-point Likert scale
253 ranging from 1 (strongly disagree) to 4 (strongly agree) where higher scores on the scale
254 suggest a favourable attitude. Ocete et al. (2017) obtained Cronbach's reliability scores
255 of 0.74 and 0.78 for the general and specific subscales of the CAIPER-S, respectively.

256 Second, the Scale of Attitudes towards Students with Disabilities in Physical
257 Education (EAADEF; Iñiguez-Santiago, Ferriz-Morell, Martínez-Galindo, Cebrián-
258 Sánchez, & Reina, 2017) is a short scale that is invariant to several socio-demographic
259 variables, such as gender, previous participation in inclusive activities, have a family
260 member with a disability and having had previous contact with a classmate with a
261 disability. The questionnaire begins with the statement *'In the subsequent scenarios, a*
262 *person with a disability...'*, followed by four statements about the behavioural (i.e.,
263 actions) component of the attitude (e.g., *'I prefer not involving a person with a*
264 *disability in my team'*). The participants answered on a five-point Likert scale ranging
265 from 1 (strongly disagree) to 5 (strongly agree) where higher scores suggest a less
266 favourable attitude towards inclusion of peers with disabilities in PE. Cronbach's
267 reliability score for this scale was set at 0.77.

268 **Data Analysis**

269 The ratio of valid pre-post questionnaires was 94.7%. Those with blank responses in
270 any item/survey or which did not include pre- or post-measurements were excluded
271 from the data analysis. Since the five interventions were conducted with natural groups,
272 significant between-group differences were observed in the pre-intervention scores
273 ($p < 0.05$) for the three variables of the attitudes (i.e., CAIPER-S general and specific
274 subscales, and EAADEF). Thus, the effect of the intervention was assessed for each of
275 the five groups by ANOVA for repeated-measures data. Another repeated-measures
276 ANOVA was conducted that included the pre- and post-intervention measurements as a
277 within-groups factor and each specific intervention as a between-groups factor. Tukey's
278 post-hoc analysis was used for multiple comparisons between intervention groups.
279 Cronbach's alphas were also calculated for the three measurements of attitudes, both in
280 the pre-test and the post-test measurements. In addition, Cohen's effect sizes (d) were
281 calculated and interpreted as follows: ≥ 0.8 (large); < 0.8 and ≥ 0.5 (moderate); < 0.5 and
282 ≥ 0.2 (small); < 0.2 (trivial) (Cohen, 1988). All analyses were performed using SPSS
283 version 24 (SPSS, Inc., Chicago, IL, USA).

284 **Results**

285 All the attitudes' variables revealed acceptable reliability scores, both in the pre- and
286 post-intervention measurements, ranging from 0.67 to 0.85 (Table 3). Table 3 also
287 shows the within-group differences from the repeated-measures ANOVA. The three
288 groups having contact with para-athletes during the interventions (i.e., CAS+ISC,
289 CAS+PDS, and PDS) improved their attitudes according to the scores of the three
290 attitude variables ($p < 0.05$; d =small). Regarding the group using supporting materials for
291 the PE students (i.e., CAS), attitude improved only for the CAIPER-S general subscale
292 ($p = 0.049$; d =trivial). Lastly, for the ACG, a significant change in the attitudes towards

293 inclusion was also observed for the CAIPER-S general subscale ($p=0.037$; d =trivial) but
294 changing to a lower attitudinal score.

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295 **Table 3.** Within-group differences in the attitudes towards the inclusion of peers with a disability in physical education classes after the
 296 intervention.

Variable	Cronbach's α		Group	Pre-Test	Post-Test	F (df)	p	Cohens's d	
	Pre-Test	Post-Test		$M \pm SD$	$M \pm SD$				
CAIPER_S General	0.80	0.85	CAS+ISC	2.92 \pm 0.59	3.04 \pm 0.62	-2.09 (124)	0.039*	-0.20	(small)
			CAS+PDS	3.10 \pm 0.59	3.22 \pm 0.61	-2.49 (121)	0.014*	-0.20	(small)
			PDS	3.28 \pm 0.57	3.42 \pm 0.51	-3.30 (112)	0.001*	-0.24	(small)
			CAS	3.32 \pm 0.48	3.31 \pm 0.57	0.20 (102)	0.844	0.02	(trivial)
			CG	3.11 \pm 0.48	3.02 \pm 0.56	2.11 (139)	0.037*	0.19	(trivial)
CAIPER_S Specific	0.67	0.73	CAS+ISC	1.63 \pm 0.79	1.79 \pm 0.84	-2.10 (124)	0.038*	-0.21	(small)
			CAS+PDS	1.76 \pm 0.97	1.99 \pm 1.03	-2.75 (121)	0.007*	-0.24	(small)
			PDS	1.59 \pm 0.82	1.78 \pm 0.93	-2.20 (112)	0.030*	-0.23	(small)
			CAS	1.68 \pm 0.89	1.88 \pm 1.00	-1.99 (102)	0.049*	-0.12	(trivial)
			CG	1.79 \pm 0.93	1.86 \pm 0.92	-0.98 (139)	0.330	-0.07	(trivial)
EAADEF	0.76	0.79	CAS+ISC	2.09 \pm 0.82	1.91 \pm 0.74	2.58 (124)	0.011*	0.22	(small)
			CAS+PDS	2.09 \pm 0.93	1.89 \pm 0.79	2.85 (121)	0.006*	0.22	(small)
			PDS	1.67 \pm 0.75	1.52 \pm 0.67	2.09 (112)	0.039*	0.20	(small)
			CAS	1.57 \pm 0.69	1.48 \pm 0.57	1.30 (102)	0.198	0.13	(trivial)
			CG	1.74 \pm 0.63	1.75 \pm 0.67	-0.11 (139)	0.912	-0.02	(trivial)

297 M = mean, SD = standard deviation; df = degrees of freedom; CAS = Curriculum Awareness Sessions; ISD = Inside-Session Contact; PDS = Paralympic Day
 298 Session; CG = Control Group; * $p < .05$

The repeated-measures ANOVA revealed significant interactions between factors for the CAIPER-S general subscale [$F(4,598)=4.61$; $p<0.01$] and the EAADEF [$F(4,598)=2.65$; $p=0.03$], but not for the specific subscale of the CAIPER-S ($p=0.64$). Table 4 synthesises the Tukey's pairwise comparisons to analyse the differential effects of the variables used to design the interventions: contact with a para-athlete during the intervention (yes vs. no), the frequency of that contact ($\times 1$ vs. $\times 3$ sessions), the duration of the intervention (1 vs. 6/7 sessions), and the provision of supplementary materials for the PE students (yes vs. no). Regarding contact, comparisons 3, 4 and 6 revealed differences ($p<0.01$; $d<0.29$) in favour of those groups where the contact took place (i.e., CAS+ISC or CAS+PDS vs. CAS or ACG). However, these differences were only obtained for the EAADEF scores and the CAIPER-S general subscale in comparison 3 (CAS+ISC vs. CAS) ($p<0.01$; $d=-0.20$). About the frequency of the contact, having a similar duration of the intervention, comparison 1 (CAS+ISC vs. CAS+PDS) did not reveal significant differences for all the attitude variables. Comparisons 2 and 5 also revealed those groups that included contact and longer interventions (i.e., CAS+ISC or CAS+PDS) improved their attitudes to a greater extent than the group with a single PDS ($d<-0.19$). However, these differences were obtained for the EAADEF scores and the CAIPER-S general subscale (comparison 2, $p<0.01$; comparison 5, $p=0.08$). Lastly, comparison 7 evaluated the differential effects of using supplementary materials for the students and the training received by the PE teachers before the programme delivering. This comparison revealed that the ACG displayed worse attitudes after the programme (CAIPER-S general subscale, $p<0.01$, $d=0.18$; EAADEF, $p=0.07$, $d=0.17$).

Table 4. Tukey's post hoc comparisons between interventions.

Pair Comparisons	Contact	Duration	Materials	CAIPER-S		EAADEF
				General	Specific	
1 CAS+ISC vs CAS+PDS	③ vs ①	□	□	No	No	No
2 CAS+ISC vs PDS	③ vs ①	⑥ vs ①	□	Yes**	No	Yes**
3 CAS+ISC vs CAS	③ vs ①	□	□	Yes**	No	Yes**
4 CAS+ISC vs CG	③ vs ①	□	■	No	No	Yes**
5 CAS+PDS vs PDS	□	⑥ vs ①	□	No*	No	Yes**
6 CAS+PDS vs CAS	① vs ①	□	□	No	No	Yes**
7 CAS vs CG	□	□	■	Yes**	No	No*

CAS = Curriculum Awareness Sessions; ISC = Inside-Session Contact; PDS = Paralympic Day Session; CG = Control Group; □ = not different; ■/● = different; ** $p < .01$; * $p < .10$

Discussion

The proper combination of several components represents a key factor when looking for the success of awareness interventions (Lindsay & Edwards, 2013). This study aimed to determine the most impactful way to promote the idea of inclusion (of students with disabilities) amongst 3rd–4th compulsory and 1st–2nd upper secondary PE students to positively impact their attitudes. Hence, the discussion is structured in accordance with the combination of factors that were used to deliver the five levels of the awareness intervention and to elicit the most significant change in attitude: that is, contact with para-athletes (yes/no), the frequency of contact (1x vs. 3x), the duration of the intervention (1–7 sessions), and the usage of complementary teaching materials (yes/no). This is followed by a general discussion on their effects on the students' attitudes and the study limitations.

First, the contact with a para-athlete during the intervention is presented as a key element in improving attitudes towards people with disabilities; that is, the CAS+ISC, CAS+PDS, and PDS groups showed significantly better attitudes after each programme implementation than before. According to Allport (1954), the level of personal connection is significant to attitude change. McKay (2018) ‘unpacked’ the components of Allport’s Contact Theory, namely equal status, cooperation, personal interactions, and support from authority. The three specific interventions noted previously included: (a) equal status since the PE students practised the three Paralympic sports from the ‘perspective’ of the para-athletes (i.e., seated for practising sitting volleyball, limiting the functioning of their arms to play boccia from a sitting position, or using visual-loss goggles when practising five-a-side football); (b) cooperation, because the intervention session was designed to promote a positive/task-involving climate in the PE class; and (c) personal interactions since the PE students played together with people with disabilities in their natural education setting. As mentioned by McKay (2018), working to align with these components of contact can enhance positive experiences, facilitating an inclusive culture and creating a platform for attitude change. Hence, contact between groups under optimal conditions could effectively reduce intergroup prejudices (i.e., attitudes) (Allport, 1954; Pettigrew & Tropp, 2006).

These outcomes also corroborate the findings by Armstrong et al. (2017), who concluded that the most effective type of contact appears to be extended contact (i.e., knowing a fellow ‘in-group’ member who has a close relationship with an ‘out-group member’) and direct contact (i.e., face-to-face interactions with individuals with disabilities) while programmes without contact would not improve one’s attitude towards people with disabilities after the interventions (De Boer, Pijl, Minnaert, & Post, 2014). Based on this, our first hypothesis would be accepted because those groups with

contact during the awareness interventions have improved their attitudes towards peers with disabilities in PE compared to those without contact. In contrast, with regards to the frequency of the contact (i.e., CAS+ISC vs. CAS+PDS), similar improvements in all three outcome variables of attitudes towards inclusion in PE were found, so there was no significant difference for this between-groups comparison.

Second, the duration of the intervention also rises as a potential factor influencing the effect on the attitudes towards inclusion in PE. When comparing those groups with contact and long duration (i.e., CAS+ISC and CAS+PDS) vs. the group with contact but a short duration of the programme (i.e., PDS), we found significant differences for the EAADEF outcome and some higher improvements for those groups exposed to the six-session intervention. Since all three groups improved their attitudes after the programme, this result is consistent with the study by Reina et al. (2011), who demonstrated that a 6-day programme was more effective than a 1-day intervention. Although other shorter programmes have also been effective (e.g., 3-day programme; Liu, Kudláček, & Ješina, 2011), a 1-day intervention, including contact, would be enough to improve attitudes towards inclusion in PE (Tavares, 2011). Compared with other 1-day interventions, which require more time for programme delivery (e.g., Paralympic School Day, 40 min per para-sport; McKay et al., 2015), the shortest intervention in the current study was constrained to the available time for the compulsory PE classes, that is, less time was available per Paralympic sport (i.e., approximately 15 min). Therefore, the second hypothesis of our study is partly accepted.

Third, two groups received the six-session programme (i.e., CAS vs. ACG) with the only differences being between the provision of teaching materials to the PE students and the pre-intervention training to promote a positive motivational climate.

While the CAS group showed a trivial but significant improvement in their attitude scores (i.e., CAIPER-S specific subscale), the ACG deteriorated in the CAIPER-S general scale, revealing between-group differences for this variable. Comparing the design of the five specific interventions, only one lesson (i.e., the introductory session) differentiates the ACG from the other four alternatives. The authors' intended to understand whether the knowledge conveyed in the introductory session would influence the experience in the subsequent sessions, and thereby the success of the intervention. The way PE teachers implemented their classes might be positively related to their attitudes towards including students with disabilities in their PE classes (De Boer, Pijl, & Minnaert, 2011). Accordingly, the ACG was the only group in the present study that exhibited a deterioration in some of the attitudes' outcomes after the programme. A recent study by Pérez-Torralba et al. (2019) that implemented an awareness programme using para-sports (i.e., boccia and goalball) for athletes with high support needs suggested that multimedia material and written and oral information influenced the improvement in attitudes. It is plausible to think that the provision of information of (probably) novel content for the PE students (i.e., Paralympic sports) would help their understanding of this educational content and the demands of people with disabilities, thus strengthening the link between knowledge and attitudes toward/acceptance of people with disabilities (Lindsay & Edwards, 2013).

Teaching strategies and the learning conditions found within the PE setting have been identified as other key elements to implement in awareness programmes to improve attitudes towards the inclusion of people with disabilities by their peers without disabilities (Wilhelmsen & Sørensen, 2017). Conversely, Armstrong et al.'s (2017) surmised that para-social contact using resources, such as videos, might be insufficient to improve children's attitudes towards disabilities. De Boer et al. (2014) stated that

talking with the students about disabilities represents a first step in shaping their attitudes because this encourages them to think about disabilities. Therefore, only when students with and without disabilities learn to understand and appreciate each other can they work and progress together towards a better understanding (Schwab, 2017).

Although our third hypothesis would be partly accepted, the trivial improvements in the CAS group recommend taking this result with caution.

Finally, it is pertinent to consider the overall outcome of the effects of the different intervention alternatives on the three variables of attitudes towards inclusion. The EAADEF is the variable that reported more significant differences in the pairwise comparisons (i.e., 6/7), compared with the general (4/7) and the specific (0/7) subscales of the CAIPER-S. Because different strategies were employed in the present study, it is plausible to think that a general measurement of the attitudes of students towards inclusion in PE would work better than a specific measurement. Overall, the five groups reported higher attitude scores in the general subscale. This mirrored the findings of Hutzler and Levi (2008), who used a sample of 120 high-school students (who were therefore of a similar age to those in the present study). Other studies using the original or an adapted version of the CAIPE-R (Block, 1994) found differences for the general subscale but not the specific subscales (Liu et al., 2011; Panagiotou et al., 2008; Xafopoulos et al., 2009). One explanation for these results could be the role of the vignette at the beginning of the questionnaire, including different sports such as baseball (Block, 1994) or basketball (Hutzler & Levi, 2008; Ocete et al., 2017; Panagiotou et al., 2008), but these interventions included activities such as sledge hockey, wheelchair mobility (non-sport specific), or boccia. If the PE students must think about a situation of inclusion throughout the vignette, it might be difficult to improve attitudes about specific statements without real experience in those situations. In our study, the three

Paralympic sports were for people with visual impairments (five-a-side football), severe physical impairments (boccia), and lower limbs impairments (sitting volleyball), while the vignette only included one scenario. For this reason, it is plausible to think that the improvements in the attitudes were best measured by the EAADEF.

Several study limitations should be mentioned. First, the PE students belonged to natural groups, and their initial level of attitude was not possible to control, so their attitude score baseline varied. For this reason, individual ANOVAs for repeated measurements were conducted, using Tukey's post-hoc analysis to compare the ratios of improvement between groups. Second, the programme alternatives were implemented in different education centres by different PE teachers, which led to some variability in delivery. Therefore, the different interventions should be tested in other education centres for better external validity. Third, the CAIPER-S survey includes a vignette of a person with a visual impairment, which would bias the responses because the awareness programme also included para-sports (i.e., boccia and sitting volleyball) for people with physical impairments. Fourth, including a sixth group as a true or passive control group (i.e., no intervention) would provide a better understanding of the intervention effects, and this should be considered in further research. The authors did attempt to control contact, duration, and teaching strategies across the five groups during the preparatory training of the physical educators before programme delivery. Fifth, although the specific interventions were delivered in different educational centres, involving the physical educators in an interactive pre-intervention training would have impacted their teaching styles. Sixth, and finally, a follow-up test should be considered in future studies to check if the changes are maintained over time, and to discern further between attitudes and intentions towards inclusion.

Conclusions and Future Research

This study contributes to the literature by analysing the differential effects of the contact with para-athletes, the contact frequency, the duration of the intervention, and the use of teaching strategies on the PE students' attitudes towards students with disabilities. All the intervention alternatives were conducted in the natural settings where PE takes place, providing ecological validity to this study. Contact with people with disabilities (i.e., para-athletes) seems to be the key factor when designing a successful programme to improve PE students' attitudes towards individuals with disabilities. However, contact variables such as the time of exposure, the quality of that contact, and personal interactions with the person with a disability require further research. Further work could also focus on analysing the impact of novelty on those students who had never experienced any type of contact (direct or indirect) with people with disabilities.

There is no singular solution to inclusion within PE classes, but rather it is a combination of actions (e.g., becoming reflexive) that supports this process. A multi-layered approach could make a difference in how all the students in class experience inclusion, including those students positioned as 'disabled' (Petrie, Devcich, & Fitzgerald, 2018). Having in mind the work of McKay, Park, and Block (2017), future research should apply a fidelity criteria instrument to measure the contact theory, seeking to control and explain how the interventions, including contact, satisfied the four components of the Contact Theory.

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