The Influence of a Teacher-Designed and -Implemented Disability Awareness Programme on the Attitudes of Students toward Inclusion

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Abstract

This study aimed to examine: (1) the influence of a disability awareness programme, designed and implemented by attendees of the *Incluye-T* programme and implemented in real educational settings, on the attitudes of their students toward the inclusion of peers with disabilities; (2) the differential effects of the disability awareness activities between classes in which physical impairment, visual impairment, or multi-impairment programmes were implemented; and (3) the influence of personal demographic variables on participants' attitudes toward the inclusion of peers with disabilities before and after the implementation of the disability awareness PE sessions. A sample of 1,105 PE students (13.1 ± 2.2 years) from 56 Spanish public educational centres took part. After the training programme on self-efficacy toward inclusion, physical educators designed and implemented awareness interventions at their schools. Physical educators implemented physical-only (23.2%), visual-only (42.9%), and combined activities for both impairments (33.9%). PE students' attitudes toward inclusion were measured pre- and post-interventions. Those who participated in combined activities revealed significant differences for the four attitude scores ($p < 0.001$), while those taking part in visual-only activities demonstrated decreased scores for the overall ($p = 0.044$) and the control beliefs subscale ($p = 0.010$). PE teachers were capable of influencing their PE students' attitudes toward inclusion using awareness activities taking into consideration the ecology of the interventions and the PE students' base level of attitudes before delivering sessions. The type of impairment/disability that was the focus of the awareness activities was an important factor that influenced the effectiveness of the interventions.

Keywords

inclusive physical education, awareness programmes, para-sport, special education needs

Introduction

Inclusion has a number of different meanings in the physical education (PE) literature, including representing a view of equal opportunity, a focus on social justice, and an emphasis on individuals' subjective experiences of belonging, acceptance, and value (Fitzgerald and Jobling, 2009; Haegele, 2019; Spencer-Cavaliere et al., 2017). One consistent message, though, is that inclusive education does not involve merely placing students with disabilities in regular schools with students without disabilities (Haegele, 2019; Wilson et al., 2020). Given the multiple meanings of inclusion presented in the literature, and recommendations to explicate how the term is used in research (Graham and Slee, 2008), we conceptually framed inclusion as the creation of meaningful learning opportunities in supportive settings where every student feels that they belong (Overton et al., 2017). This definition supports students' social and active participation in educational classes as well as the full development of their potential through an accessible process of teaching that considers students' diversity, including those with special educational needs (SEN) (UNESCO, 1994). Importantly, inclusion is considered to be one of the mandatory principles of many European national education systems, including the one that is the focus of this research, Spain.

Inclusion is a complex phenomenon (Haegele, 2019), and therefore research examining the particularities of inclusion in PE has explored a variety of perspectives (e.g. PE teachers, SEN coordinators and learning support assistants, children with and without disabilities) and the influence of a variety of factors on the inclusiveness of PE classes (Reina et al., 2019a; Tant and Watelain, 2016; Wilhelmsen and Sørensen, 2017).

In this particular study, we focus specifically on the attitudes of peers without disabilities, and whether a training programme designed to improve PE teachers' (PETs) self-efficacy in introducing disability awareness activities during their regular PE sessions can enhance peers' attitudes toward the inclusion of students with disabilities in their classes.

According to McKay and colleagues (2019), attitudes of the peer group are among the most important variables in successful inclusive practice in PE. As such, it is not surprising that the attitudes of peers without disabilities toward inclusion have been the focus of several studies in the PE literature (Hutzler, 2003; McKay et al., 2015, 2018; Reina et al., 2011). Within this line of inquiry, research suggests that overall attitudes about disability and inclusion among peer groups appear to be positive, with students without disabilities generally having favourable attitudes toward participating alongside peers with disabilities in activities and coexisting with them in classes (Hutzler, 2003; McKay et al., 2019; Obrusnikova et al., 2010). However, a lack of peer acceptance may still manifest among peers, even with growing interactions and awareness of those with disabilities (De Boer et al., 2014). For example, in a recent study describing the utility of a disability awareness programme in enhancing attitudes of peers toward those with disabilities, ableist tones and notions persisted among a subset of participants even after the completion of the intervention (McKay et al., 2019).

The importance of peer attitudes in supporting inclusive practice in PE has sparked the proliferation of the development and implementation of interventions, largely in the form of disability awareness programmes, seeking to enhance these attitudes (Grenier and Kearns, 2012; Hutzler et al., 2007; McKay et al., 2015, 2019). Many of these programmes, such as the Paralympic School Day programme, include a combination of (a) participation in disability sports activities led by athletes with disabilities, and (b) conversations with athletes with disabilities about inclusion and their Paralympic

115 experiences (Kirk et al., 2020; Liu et al., 2010; McKay et al., 2015). While this line of
116 inquiry provides support for the efficacy of disability awareness programmes in raising
117 awareness and decreasing discomfort when interacting with peers with disabilities
118 (Grenier and Kearns, 2012; Liu et al., 2010; McKay et al., 2019), there are notable
119 limitations. For example, these programmes tend to rely on the involvement of elite
120 Paralympic athletes and specialized sports equipment to help elicit attitudinal change (Liu
121 et al., 2010; McKay et al., 2019), which may not be readily available in all educational
122 contexts and limits implementation to small sample sizes. As such, the current study is in
123 line with McKay and colleagues' (2015) suggestion for research to be conducted on in-
124 service teacher professional development programmes that enhance teachers' abilities to
125 deliver disability awareness activities, and to understand how those teachers then deliver
126 these programmes to elicit an attitudinal change of peers. This study is focused on
127 understanding the attitudinal change of peers toward students with disabilities as a result
128 of a disability awareness programme implemented by teachers after participating in a
129 professional development programme called *Incluye-T* (Reina et al., 2019a).
130 In this study, peer attitudes were conceptually understood through the lens of Ajzen's
131 (1991) theory of planned behaviour (TPB). TPB is a psychological framework designed
132 to examine the relationship between beliefs and behaviours (Ajzen, 1991). According to
133 TPB, attitudes are one of three belief-related variables, along with subjective normative
134 beliefs and perceived behavioural control, that can strengthen or weaken one's intention
135 to engage in a behaviour. Attitudes are defined as general appraisals of behaviour and
136 may be favourable or unfavourable (Ajzen, 1991). In the current study, when peers
137 perceive the inclusion of students with disabilities favourably, they are more likely to
138 intend to engage in activities with them. Attitudes can also be improved by increasing
139 control beliefs and subjective norms (Kirk and Haegele, 2019). As such, if PE students

(i.e. without a disability) believe that they can succeed in an inclusive setting and those around them will support this (e.g. their PE teachers), they are more likely to have a positive attitude toward inclusive PE.

Professional development and inclusion: Incluye-T

The *Incluye-T* programme was designed to improve the self-efficacy of in-service PETs to successfully include students with SEN in PE via the development of necessary attitudes, knowledge, and skills (Reina et al., 2019a). Self-efficacy, individuals' "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments", is one of the strongest determining mechanisms of positive attitudes and intentions toward responsible actions (Bandura, 1997: 3). As postulated by Jovanović and colleagues (2014), self-efficacy is among the most important parameters for achieving successful inclusion. In PE, the importance of self-efficacy is reflected by how teachers adapt learning situations, set objectives, use methodologies, and conduct or solve conflicts to attend to diversity in the classroom (Reina et al., 2018).

Research on the *Incluye-T* programme, which includes theoretical and practical components where teachers experience vicarious and mastery experiences of modifying activities, equipment, and instruction with students with SEN via the use of simulations, has been shown to elicit significant improvements in teachers' self-efficacy in instructing students with intellectual, physical, and visual impairments (Reina et al., 2019a). Within this programme, teachers receive training on how to develop and implement disability awareness programmes of their own, in the form of disability simulation activities, which can then be implemented in their real educational settings. Also, this programme has demonstrated invariant effects in considering the PETs' educational settings (i.e. primary vs secondary schools) and gender (male vs female) (Reina et al., 2019a), and the geographical regions where the programme took place (peninsular vs insular regions)

(Reina et al., 2019b). However, research focused on this programme has not yet examined how this training and the subsequent disability awareness programme implementation in schools can enhance the attitudes of peers toward students with disabilities. As such, the primary purpose of this study was to examine the influence of a disability awareness programme, designed and implemented by attendees of the *Incluye-T* programme and implemented in a real school setting, on the attitudes of their students toward the inclusion of peers with disabilities.

Within the *Incluye-T* programme, attendees receive training on how to implement disability simulation activities relative to individuals with physical, visual, hearing, and intellectual impairments. It is known that factors such as students' age or type of disability are associated with PETs' attitudes, and consequently the efficacy of their teaching (Wilhelmsen and Sørensen, 2017). Moreover, teachers' self-efficacy toward the inclusion of children with disabilities can be specific to the type of disability or curriculum content (Block et al., 2013). For example, Jovanović et al. (2014) studied the influence of the types of disability on PETs' attitudes and self-efficacy in Serbia, and teachers expressed more confidence in teaching students with physical impairments than students with visual impairments. Similarly, Lirgg et al. (2017) suggested that children with visual impairments are viewed as one of the most complicated groups to include in general PE classes. The feelings that teachers have about including students with disabilities may influence the views of their students without disabilities, who tend to reproduce their teachers' feelings about, and interactions with, individuals with certain disabilities during peer-to-peer interactions (Haegele and Zhu, 2017). As such, the second aim of this study was to examine the differential effects of the disability awareness activities between classes in which physical impairment, visual impairment, or multi-impairment programmes were implemented.

In addition to programmatic factors (e.g. the disability focus of the programme), it is also known that a number of personal factors may cause an attitudinal change during disability awareness programmes, such as having a family member or friend with a disability, or having prior contact with classmates with a disability. In other words, having family members or close friends (Bossaert et al., 2011; Vignes et al., 2009) or prior positive experiences with classmates with disabilities (Cairns and McClatchey, 2013; Schwab, 2017) may positively change peer attitudes toward disability. However, this positive expression is not always guaranteed. For example, in a study by Hutzler and colleagues (2005), attitudes toward classmates with disabilities appeared to improve if prior experiences with classmates with disabilities were successful and associated with positive results; however, in instances where prior experiences were viewed as unsuccessful or negative, attitudes either remained unchanged or deteriorated. Given the prior mixed results when examining the influence of personal factors on peer attitudes, the final aim of this study was to explore the influence of personal demographic variables on participants' attitudes toward the inclusion of peers with disabilities before and after the implementation of the disability awareness PE sessions.

To summarize, the three aims and hypotheses of this study were:

a) to examine the influence of a disability awareness programme, designed and implemented by attendees of the *Incluye-T* programme and implemented in real educational settings, on the attitudes of their students toward the inclusion of peers with disabilities; hypothesizing that PE students' attitudes toward the inclusion of peers with disabilities would improve after exposure to the disability awareness programme;

b) to examine the differential effects of the disability awareness activities between classes in which physical impairment, visual impairment, or multi-impairment

programmes were implemented; hypothesizing that multi-impairment awareness activities would improve attitudes towards inclusion to a higher extent than impairment-only interventions; and

c) to explore the influence of personal demographic variables on participants' attitudes toward the inclusion of peers with disabilities before and after the implementation of the disability awareness PE sessions; hypothesising that those reporting previous experiences with people with a disability or having participated in inclusive sports activities would have more favourable attitudes towards inclusion.

Methods

Participants

A convenience sample of 1,105 PE students (11–16 years old, 574 boys and 531 girls) from 56 public educational centres from the Valencian Community (i.e. east of Spain) took part in this study. Permissions from the Regional Education Board and the School Board were obtained. Before data collection, the Ethics Committee for Research of the principal investigator's university approved the study (Reference: DPS.RRV01.15).

Procedures

Face-to-face training programme prior to the interventions

Prior to conducting interventions in the schools, each PET (n = 56) attended a professional training programme called *Incluye-T* (Reina et al., 2019a). *Incluye-T*, recognized by the Valencian Community regional government as an official training programme for in-service physical educators, aimed to improve the PETs' self-efficacy in successfully including students with physical, visual, and intellectual impairments in PE classes. The programme consisted of six sessions of three hours each, conducted over three consecutive weeks, two days per week. All of the principal elements of the training

programme (i.e. duration, number and distribution of the sessions, administration of pre- and post-tests, instructors, content, and time of contact with a para-athlete) remained constant in all the training programmes that were carried out. Each session involved a theoretical component, followed by a practical component including modifying activities, equipment, and instruction for students with SEN via the use of simulations (Reina et al., 2019a).

To complete the *Incluye-T* programme, and after the 18 hours of in-person training, PETs must conduct an awareness intervention in their PE setting within three months of the last training session. Physical educators were given one month after the completion of the training period to send a draft of their plan for their awareness intervention to the *Incluye-T* education/research team. The instructions that were provided to PETs were to develop an intervention that: i) adapted the curricular content they were working on to promote disability awareness; ii) used simulation strategies and low-cost equipment that is regularly available in educational settings (e.g. no wheelchairs available); and iii) implemented task modifications that allowed the inclusion of students with physical, visual, or intellectual impairments for a minimum of two and a maximum of four PE sessions. All PETs freely chose the content and type of disability of their interventions in light of their teaching plans for the semester, their preferences and/or confidence, and their available resources and facilities. Given the individualized and unique nature of the interventions, each of which was developed and implemented by teachers for their specific educational setting, fidelity for intervention implementation was not examined. All interventions were checked by the training programme teachers and feedback about the appropriateness and feasibility of the intervention was provided within 15 days. When the approval from the *Incluye-T* education/research team was received, the PETs implemented the interventions in their general PE classes of 45–50 minutes each.

Interventions at real educational settings

Overall, PETs implemented a mean of 2.54 (SD = 0.90) sessions. From the 56 physical educators that successfully conducted the interventions, 13 implemented awareness activities for people with physical impairments with 241 students (2.23 ± 0.64 sessions), 24 based their interventions on awareness activities for people with visual impairments with 447 students (2.20 ± 0.28 sessions), and the remaining 19 combined activities for both physical and visual impairments for 417 individuals (3.07 ± 0.97 sessions). PETs who did not follow the requirements in performing the intervention were removed from this study (i.e. performed less than two intervention sessions or did not accomplish the timeline proposed). Very few PETs conducted awareness programmes including hearing or intellectual impairment simulations, and therefore these were not included in this study. The *Incluye-T* Guide (Reina et al., 2018) provides guidelines about how physical and visual impairments can be simulated (see Table 1). Those impairments are based on the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) for impaired sensory (i.e. vision impairment), neuromusculoskeletal, and movement-related body functions (i.e. ataxia, athetosis, hypertonia, impaired muscle power, and impaired range of movement), and impaired movement body structures (i.e. leg limb deficiency, leg length difference, and short stature). This taxonomy is used for determining how impairment impacts sport/physical activity performance (Tweedy, 2002), and more specifically, those activities related to mobility according to the ICF. The implemented interventions aimed to raise awareness of those with disabilities among school-aged students. It is important to note that no students with disabilities were enrolled in any of the classrooms where the interventions took place during the time of the interventions.

288 **Table 1.** Options provided to physical educators to simulate impairments and adapting
289 tasks.

Impairment	Awareness options and recommendations
Ataxia	Limiting the free-running phases during games and/or increasing the base of support. The participant would carry something between the legs while walking, which cannot fall (e.g. a softball).
Athetosis	The students should wear bracelets and anklets with bells that should not stop ringing at any time.
Hypertonia	Depending on the severity of the impairment, there are different ways to raise awareness: (a) moderate activity limitation: using elastic bands to limit certain body movements; or (b) severe activity limitation: placing rigid materials on the joint axes to cause a constant extension or flexion of the joints. Hemiparesis can also be simulated by carrying a small ball under the arm.
Impaired Muscle Power	Carrying a ballast weight on their limbs. In the event of highly affected lower limbs, the activities can be implemented in wheelchairs or directly on the ground. The students can also use medicine/exercise balls or ballasted equipment to increase resistance when throwing. Supporting elements such as canes, crutches or walkers can also be used for the simulations.
Impaired Range of Movement	Using ropes or scrunchies on some joints to prevent their full mobility or achieve the maximum range of motion.
Legs Length Difference	Adding a sole to a shoe, using stilts, or walking with one foot on tiptoe. Another simple variation is the use of only a single shoe or the use of both shoes with different sole thicknesses.
Limb Deficiency	*Upper extremities*: tying the arms together with ropes; this way we are preventing the use of certain limbs (uni- or bilateral). Also, the student can simulate the absence of his/her hand by holding a ball, preventing its use during the activities. *Lower extremities*: playing sports on the ground – either sitting or kneeling – or holding a foot to the back (i.e. tied with ropes), with the help of crutches or canes. It is also possible to use a wheelchair in this simulation.
Short Stature	Students play various games on their knees only (for this, kneepads are highly recommended).
Visual Impairment	Using eyewear (glasses, goggles, patches) that are designed to mimic and simulate different types of visual impairment (i.e. loss of central vision, loss of peripheral vision, blurry vision, or scotomas); or blindfolds, which help to simulate total blindness.

290

291 Sessions in which the main goal was to raise disability awareness through visual
292 impairment simulations included activities where students worked in pairs, and where

one of the peers was blindfolded. Students participated in games focused on orientation and spatial perception skills with little movement required for familiarization and safety reasons. Afterwards, teachers introduced games with more dynamic displacements and ended with games to enhance different motor skills, highlighting changes in movement patterns provoked by the blindness simulation. Goalball was a common game used as an example of a para-sport within the intervention. With regard to the awareness sessions focused on physical impairments, the general structure used by PETs was to constrain students' motor abilities beginning at the start of the sessions. Basic locomotor activities, such as walking/jogging around the available space, were used to introduce students to physical limitations. Afterwards, more dynamic/complex activities with a higher level of stimuli (e.g. use of equipment such as balls for passing, dribbling, bouncing, or kicking) were added gradually, ending with competitive games (e.g. sitting volleyball). Finally, those PETs that conducted a multi-disability intervention combined games with different sensory and/or physical limitations in which basic motor skills were targeted. The general sequence typical for interventions focused on one impairment (i.e. basic *motor* skills → collaborative games → competitive games or para-sport) was not followed by this subgroup.

Measurements

The measures for this study included a six-question demographic survey and the Attitudes Towards Inclusion in PE Questionnaire (ATIPEQ). At the beginning of the survey, two questions measured the students' demographic variables of gender and age. Following this, four questions inquired about the participants' previous contact with people with disabilities. These questions sought to discover whether the participants had a relative or friend with a disability, a classmate with a disability in general lessons, a classmate with

317 a disability in PE, and whether they had ever participated in a sports activity with a person
318 with a disability.

319 The *ATIPEQ* was then used to assess PE students' attitudes pre- and post-test
320 awareness interventions. Before the presentation of the questionnaire items, an example
321 of a peer with a physical disability (Mary/Charlie) who uses a wheelchair was shared.
322 This example was accompanied by a vignette with a brief explanation of the most
323 important characteristics of this peer with a disability. The questionnaire included a total
324 of 15 items related to the three dimensions of the TPB (Ajzen, 1991). The first subscale,
325 *behavioural beliefs*, was evaluated by five items (e.g. *"I would feel happy to play with*
326 *Mary/Charlie"*). Another five items (e.g. *"My parents would approve that I help*
327 *Mary/Charlie"*) measured the *subjective beliefs* subscale, which is the second attitude
328 subscale. The remaining five items (e.g. *"Mary/Charlie should have more opportunities*
329 *in an elimination game, for example, more lives in a game of catching"*) evaluated the
330 third dimension of the TPB, the *control beliefs* subscale. All 15 items are scored using a
331 six-point Likert-type scale ranging from 1 (*"totally disagree"*) to 6 (*"totally agree"*).
332 Higher scores indicated more positive attitudes, but in six items, the opposite was the case
333 (i.e. lower results meant more positive attitudes). This is the second study to use this tool
334 in the Spanish context (Pérez-Torralba et al., 2019), with the prior study demonstrating
335 the following subscales' reliability scores: behavioural beliefs ($\alpha = 0.475$), subjective
336 beliefs ($\alpha = 0.426$), and control beliefs ($\alpha = 0.320$). It should be noted, however, that the
337 ATIPEQ has features of other well-used attitudinal surveys (Block, 1995) and is the result
338 of 15 years of previous research (Ocete et al., 2017; Reina et al., 2011, 2016) that has
339 sought to construct the optimal tool for measuring attitudes toward inclusion in PE in the
340 Spanish context.

Data analysis

Descriptive statistics were expressed as mean (M) and standard deviation (SD). Descriptive statistical analyses were conducted to represent the participants' demographic characteristics, including percentages. Data were screened for normality of distribution and homogeneity of variance using the Kolmogorov–Smirnov and Levene's tests, respectively, to determine the appropriateness of using parametric techniques for data analysis. ATIPEQ reliability was assessed by calculating the Cronbach's alpha, with acceptable scores being over 0.70 (Nunnally and Bernstein, 1994). To determine the internal consistency of the subscales to evaluate attitudes, the relationships among the ATIPEQ subscales were assessed using Pearson's product-moment correlations (*r*). The following scale of magnitude was used to evaluate correlation coefficients: < 0.09, trivial; 0.10–0.29, small; < 0.30–0.49, moderate; < 0.50–0.69, large; < 0.70–0.89, very large; and > 0.90, almost perfect (Hopkins et al., 2009). A 2 x 3 mixed ANOVA was used, considering the intervention in a real PE setting (i.e. pre- vs post-intervention) as the within-group factor and the type/s of impairment/s chosen by PETs for implementing the awareness sessions as a between-group factor (i.e. physical, visual, and multiple impairments). A Tukey's honestly significant difference post hoc analysis was used for multiple comparisons in the between-group factor. Practical significance in repeated-measures ANOVA analyses was calculated by partial eta-squared (ηp^2) as a measure of effect size for mean differences with the following interpretation: > 0.26, between 0.25 and 0.02, and < 0.02 were considered as large, medium, and small, respectively (Pierce et al., 2004). The pre-post attitude ratio was calculated to assess the mediating effect of the demographic variables, using one-way ANOVAs for this purpose. Data analyses were conducted using the Statistical Package for the Social Sciences (version 24.0 for

365 Windows, SPSS Inc., Chicago, IL, USA). Statistical significance was set at an alpha level
366 of $p < 0.05$.

367 Results

368 *Demographics*

369 A sample of 1,105 participants was included for this study; 51.95% were boys (M_{age} =
370 13.18; SD = 2.15 years) and 48.05% were girls (M_{age} = 13.10; SD = 2.13 years). More
371 than half (60.69%) of the participants reported having contact with a family member,
372 friend, or close neighbour with some type of disability. About 50% (50.14%) of the
373 participants had had previous contact with a classmate with a disability in their school
374 setting, and about 40% had had previous contact in the PE setting (40.69%) and reported
375 participation in physical activities or games with, or had had contact with, persons with
376 disabilities (39.45%) (see Table 2).

377 **Table 2.** Sample demographics.

	Age (M ± SD)	Contact with People with a Disability			Previous Participation in Inclusive Activities
		Family / Community	Classmate in School	Classmate in PE Class	
Boys	13.18 ± 2.18	30.53%	26.26%	20.89%	21.19%
Girls	13.10 ± 2.13	30.16%	23.88%	19.80%	18.26%
Overall	13.14 ± 2.16	60.69%	50.14%	40.69%	39.45%

378 M = mean, SD = standard deviation, PE = physical education

379 *Scale reliability and internal consistency*

380 Cronbach's alpha scores were calculated for the three ATIPEQ subscales and the overall
381 attitude score, showing scores ranging from 0.50 to 0.74 for the pre-test measurements
382 and from 0.51 to 0.84 for the post-test measurements (Table 3). Table 3 also shows
383 moderate-to-high correlations between the three attitude subscales ($0.40 < r < 0.68$; $p <$
384 0.001), while very large correlations were found between the three subscales and the

385 overall attitude score ($0.78 < r < 0.89$; $p < 0.001$). Overall, slightly better internal
386 consistency values were found in the post-test than in the pre-test measurements.
387
388 **Table 3.** Cronbach´s alpha scores for the pre-test and post-test measurements of the
389 attitudes towards inclusion.

Attitude Subscales	Pre-Interventions					Post-Interventions				
	α	1.	2.	3.	4.	α	1.	2.	3.	4.
1. Behavioural	0.55	--	0.54**	0.52**	0.81**	0.75	--	0.63**	0.68**	0.89**
2. Subjective	0.50		--	0.40**	0.78**	0.51		--	0.48**	0.78**
3. Control	0.51			--	0.83**	0.69			--	0.89**
4. Overall	0.74				--	0.84				--

390 ** $p < 0.01$

391 *Intervention and interaction effects*

392 Table 4 shows the means and standard deviations of the pre- and post-test measurements,
393 considering the overall sample and the three subgroups. The overall effect of the within-
394 group factor (i.e. intervention) revealed significant differences for the overall attitude
395 score ($p = 0.013$) and the subjective beliefs subscale ($p < 0.001$), that is, increasing their
396 attitude scores after the awareness interventions. The group that received awareness
397 interventions based on multi-impairments revealed significant differences for the four
398 attitude scores ($p < 0.001$), that is, they increased their attitude scores compared to the
399 pre-intervention measurements. However, the group that received the visual impairment-
400 only awareness intervention demonstrated lower overall ($p = 0.044$) and control beliefs
401 subscale ($p = 0.010$) attitude scores. There were interaction effects between the two
402 factors of the mixed ANOVA model for both the overall attitude score [$F(2,1102) = 9.03$;
403 $p < 0.001$; $\eta p^2 = 0.016$, small] and the three ATIPEQ subscales: behavioural beliefs
404 [$F(2,1102) = 13.51$; $p < 0.001$; $\eta p^2 = 0.024$, medium], subjective beliefs [$F(2,1102) =$
405 14.33; $p < 0.001$; $\eta p^2 = 0.025$, medium], and control beliefs [$F(2,1102) = 18.08$; $p < 0.001$;

406 $\eta p^2 = 0.032$, medium]. Likewise, there were between-group significant differences for the
407 overall attitude score [$F(2,1102) = 3.02$; $p < 0.049$; $\eta p^2 = 0.005$, small] and the control
408 beliefs subscale [$F(2,1102) = 6.10$; $p < 0.001$; $\eta p^2 = 0.011$, small].
409
410 **Table 4.** Mixed-model ANOVA outcomes and pairwise comparisons for the between-
411 group factor.

Attitude Subscale	Group	Pre-test (M ± SD)	Post-test (M ± SD)	F	*p*	ηp^2
Behavioural	Physical	5.15 ± 0.74	5.18 ± 0.79	0.97	0.325	0.004
	Visual	5.12 ± 0.79	5.02 ± 1.31	2.31	0.129	0.005
	Combined	5.06 ± 0.82	5.26 ± 0.72	23.47	< 0.001	0.053
	Overall	5.10 ± 0.79	5.15 ± 1.02	2.53	0.112	0.002
Subjective	Physical	5.05 ± 0.96	5.10 ± 0.91	0.62	0.432	0.003
	Visual	5.07 ± 0.86	5.04 ± 0.95	0.39	0.534	0.001
	Combined	4.90 ± 0.93	5.21 ± 0.83	39.53	< 0.001	0.087
	Overall	5.00 ± 0.92	5.12 ± 0.90	12.51	< 0.001	0.011
Control	Physical	4.78 ± 0.83	4.82 ± 0.87	0.98	0.322	0.004
	Visual	4.69 ± 0.79	4.54 ± 1.10	6.70	0.010	0.015
	Combined	4.64 ± 0.84	4.87 ± 0.90	21.92	< 0.001	0.050
	Overall	4.69 ± 0.82	4.73 ± 0.99	1.82	0.177	0.002
Overall	Physical	4.97 ± 0.68	5.01 ± 0.70	1.54	0.216	0.006
	Visual	4.92 ± 0.65	4.83 ± 1.01	4.07	0.044	0.009
	Combined	4.84 ± 0.71	5.08 ± 0.65	43.15	< 0.001	0.094
	Overall	4.90 ± 0.68	4.97 ± 0.83	6.17	0.013	0.006

412 M = mean, SD = standard deviation

413 *Mediating effect of demographic variables*

414 Four one-way ANOVAs were conducted to assess the mediating effect of the four
415 demographic variables on the pre-post attitude ratios (see Table 5). Significant differences
416 were found for the four attitude scores when PE students had had previous contact with a
417 classmate with a disability ($p < 0.001$), with higher improvement ratios for those that
418 reported affirmatively. Similar results were found when the contact had been in the PE

class ($p < 0.010$), except for the subjective subscale. For the other two demographic variables, we only found significant differences for the control beliefs subscale when PE students had previously participated in an awareness activity based on simulation of disability ($p = 0.030$), and those with previous participations had a higher attitude ratio (i.e. improved their pre-intervention attitude score).

Table 5. One-way ANOVA for pair comparisons of the four demographic variables.

Demographic variable	Attitude variable	Yes (M ± SD)	No (M ± SD)	F	*p*
Family member or friend with a disability	Behavioural	0.07 ± 1.04	0.02 ± 1.16	0.38	0.535
	Subjective	0.15 ± 0.97	0.10 ± 1.10	0.68	0.410
	Control	0.09 ± 1.00	-0.03 ± 1.17	2.44	0.118
	Overall	0.10 ± 0.83	0.02 ± 0.96	1.68	0.195
Classmate with a disability at the school setting	Behavioural	0.19 ± 0.87	-0.10 ± 1.27	17.26	< 0.001
	Subjective	0.23 ± 0.98	0.02 ± 1.04	9.57	0.002
	Control	0.18 ± 0.89	-0.11 ± 1.22	16.82	< 0.001
	Overall	0.20 ± 0.72	-0.07 ± 1.00	21.34	< 0.001
Classmate with a disability in the PE class	Behavioural	0.15 ± 0.88	-0.03 ± 1.22	6.73	0.010
	Subjective	0.17 ± 0.92	0.10 ± 1.09	0.84	0.359
	Control	0.16 ± 0.86	-0.05 ± 1.20	8.86	0.003
	Overall	0.16 ± 0.69	-0.01 ± 0.99	7.52	0.006
Previous participation in awareness activities	Behavioural	0.09 ± 0.98	0.01 ± 1.16	1.17	0.280
	Subjective	0.16 ± 0.94	0.11 ± 1.07	0.44	0.505
	Control	0.13 ± 0.99	-0.02 ± 1.12	4.73	0.030
	Overall	0.13 ± 0.78	0.03 ± 0.94	3.04	0.081

M = mean, SD = standard deviation, PE = physical education

Discussion

The primary aim of this study was to examine the effect of a disability awareness programme, designed and implemented by attendees in the *Incluye-T* programme and implemented in their real educational settings, on the attitudes of their PE students toward

the inclusion of peers with disabilities in PE. Altogether, the overall findings support the effectiveness of disability awareness interventions in eliciting positive overall attitudinal changes ($p = 0.013$) among peers. However, readers are encouraged to consider the low effect size and the interaction effects found concerning the type of disability chosen when interpreting these results. In that regard, the findings of this study are still a novel and relevant addition to the literature, as they demonstrate that a professional development workshop can be used to instruct teachers in strategies to implement disability awareness activities that elicit positive attitudinal change among peers.

There is a rich history of research showing the relevance of awareness programmes in Europe and all over the world over the past 10–15 years (Liu et al., 2010; Ocete et al., 2020; Panagiotou et al., 2008; Xafopoulos et al., 2009). This includes research that supports the utilization of awareness programmes to enhance attitudes, both as unidimensional (Liu et al., 2010; Ocete et al., 2020; Panagiotou et al., 2008; Xafopoulos et al., 2009) and multidimensional concepts (Reina et al., 2020), and in school-based (Armstrong et al., 2017) and university-based contexts (Úbeda-Colomer et al., 2019). Unique to this prior research, the *Incluye-T* programme (i.e. a professional development workshop) is not an intervention that researchers directly implement with peers, but rather provides the tools and self-efficacy for teachers to return to their teaching contexts to deliver the disability awareness programme (Reina et al., 2019a). Given this structure, *Incluye-T* may provide a suitable option to enhance the attitudes of larger groups of children across a broad geographical region that may be otherwise impossible using intervention programmes that depend on researcher/specialist-directed implementation. As such, this study adds to the existing empirical support of the efficacy of the *Incluye-T* programme in helping to enhance inclusive PE experiences in schools (Reina et al., 2019a, 2019b). This study supports the implementation of the *Incluye-T* programme as a

cost-effective alternative to other disability awareness programmes that tend to be dependent on elite athletes with disabilities and specialized equipment to elicit attitudinal change among peers (Liu et al., 2010; McKay et al., 2019). Hence, the first hypothesis of this study has been accepted.

In research concerning interventions aimed at enhancing attitudes toward peers with disabilities, it is pertinent to consider baseline attitudes before the interventions. For example, in our study, the lowest mean attitude score before the interventions was 4.64 (i.e. control beliefs for the combined intervention group), which is 77.33% of the maximum score. High baseline attitudes are also relevant in prior research in European countries. For example, in the prior study by Pérez-Torralba et al. (2019), which also used the ATIPEQ, the baseline scores ranged from 4.74 to 5.19, or 79.00% to 86.50% of the maximum score. Other studies, using adapted versions of the CAIPE-R inventory (Block, 1995), reported similar baseline scores on a 1–4 Likert scale in Greece (Panagiotou et al., 2008: 3.25–3.57, 81.25–89.30 %), the Czech Republic (Liu et al., 2010: 2.84–3.56, 71.00–89.03 %), Portugal (Campos et al., 2014: 3.17–3.50, 79.25–87.50 %), and Spain (Ocete et al., 2020: 3.06–3.33, 76.50–83.25 %). Therefore, there is cross-country evidence demonstrating high baseline attitude scores before the interventions, making it more difficult to provoke attitudinal change due to ceiling effects (McKay et al., 2019). This may provide further support for the positive findings in the current study, given the challenges associated with enhancing already favourable attitudes toward students with disabilities in PE classes.

Interestingly, the implementation of the disability awareness activities demonstrated differential effects (aim 2) based on the type of disabilities that the simulations were focused on. Importantly, the group that received the multi-impairment intervention package experienced significant attitudinal changes in behavioural beliefs, subjective

beliefs, and control beliefs. Given the importance of each of the three belief categories in influencing overall attitudes (Ajzen, 1991), it is therefore unsurprising that those who received the multi-impairment intervention also experienced the most notable positive overall attitude shift. Like those who experienced the multi-impairment intervention, those who received the physical impairment-only interventions also demonstrated enhanced positive behavioural beliefs, subjective beliefs, control beliefs, and overall attitudes toward the inclusion of students with disabilities in PE, albeit to a lesser extent. Finally, students that received the visual impairment-only awareness interventions decreased their overall attitude scores. The existing literature has shown that PETs' background or experience in accommodating or making modifications for students with visual impairments is scarce (Perkins et al., 2013). This fact has recently been corroborated in a study in which adults with visual impairment talked about their experiences in PE (Haegele et al., 2020), where participants revealed feelings of frustration and negative experiences due to a lack of active and meaningful participation in the classes. PETs training in adapted PE is becoming increasingly frequent in pre-service teachers' curricula (An and Decker, 2019; Jiménez-Monteagudo and Hernández-Álvarez, 2013). Face-to-face (McKay et al., 2019; Reina et al, 2019a, 2019b) and online format training opportunities for in-service teachers are also available (Healy et al., 2020). However, even though these programmes have led to improvements in PETs' attitudes (McKay et al., 2019) and self-efficacy (Healy et al., 2020; Reina et al., 2019a, 2019b), the challenge to address students with visual impairment, or awareness activities in PE classes, does not seem to have been overcome yet. Thus, the second hypothesis of this study is partly confirmed due to the variable findings of the physical (i.e. no significant differences) and visual impairment-only (i.e. significant decrease in two of the four attitude variables) interventions, but also because of the lack of enough interventions

based on intellectual impairment (i.e. the third self-efficacy subscale assessed on PETs after their face-to-face training; Reina et al., 2019c).

With regard to the last aim of this study, students with previous experiences with a classmate with disability presented better attitude levels. Our findings are in line with other studies that have shown that people who have (positive) experience with others with disabilities, no matter what type, tend to present favourable attitudes toward such individuals (Barr and Bracchitta, 2015). According to Allport's (1954) contact theory, the level of personal connection is significant to attitude change. As mentioned by McKay (2018), contact with people with disabilities can enhance positive experiences, facilitating an inclusive culture and creating a platform for attitude change. Our outcomes are also in line with the conclusions by Armstrong et al. (2017), who postulated that the most effective types of contact are extended (i.e. knowing a fellow "in-group" member who has a close relationship with an "out-group member") and direct (i.e. face-to-face interactions with individuals with disabilities) contact. Hence, the third hypothesis for this study would also be confirmed.

Some study limitations should be mentioned. First, the ATIPEQ survey includes a vignette about a person with a physical disability and this would bias the responses for the awareness interventions using other impairments (i.e. visual-only or multi-impairments). However, this scale was also used in a study to improve attitudes towards inclusion using two Paralympic sports for para-athletes with high support needs, including physical (i.e. boccia) and visual (i.e. goalball) impairments (Pérez-Torralba et al., 2019). In the future, different vignettes with different types of disability/impairment should be included in a similar way to how they appear in the PETs' self-efficacy survey (Reina et al., 2019c). Second, the sample of PETs that freely chose to implement interventions using intellectual impairments was trivial in size and not included in the

study. We believe that a "direct simulation" of intellectual impairment is more complex, but this is a topic that requires further research. Third, although a supervision of the teaching plans was conducted by the research staff prior to delivering, there was no full scrutiny of the PETs' interventions due to the geographical dispersion of their school settings. Fourth, a follow-up measurement would be pertinent sometime after the post-test to examine the long-term impact of the intervention on attitudinal change, but the closeness of the academic year-end impeded that measurement. Finally, the number of sessions used by PETs for their interventions was not the same, but some research suggested that a one-day session would be enough for improving attitudes towards inclusion using awareness activities and para-sports (i.e. football 5-a-side for blind people) (Reina et al., 2011).

Conclusion

This study demonstrates that in-service PETs that attended an 18-hour face-to-face training programme to improve their self-efficacy towards inclusion (i.e. *Incluye-T*) are capable of influencing their PE students' attitudes towards inclusion using awareness interventions at their educational settings. This finding is relevant considering the ecology of this study and the PE students' base level of attitudes before delivering sessions. The study also demonstrates that physical educators had a preference for implementing visual impairment-only (42.9%) instead of multi-impairment (33.9%) or physical impairment-only (23.2%) interventions, but better improvements were found when the awareness activities included different impairments. This study also suggests the relevance of applying protocols to introduce PE students to awareness activities based on visual impairments/blindness.

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