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Reliability of a Scale for Improving Attitudes towards Inclusion of Students with Disabilities in Physical Education

Fiabilidad de una escala para mejorar las actitudes hacia la inclusión de estudiantes con discapacidad en Educación Física

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Resumen. El derecho a la educación inclusiva es un tema que ha llamado la atención de organizaciones públicas, académicos y estudiosos de todo el mundo. Las creencias y percepciones de los alumnos son un eje fundamental para conocer el estado de las aulas en base a este principio ético, permitiendo a los profesionales de la enseñanza promover estrategias y programas de mejora. Este estudio tiene como objetivo explorar la fiabilidad y estructura factorial del cuestionario «Actitudes hacia la Inclusión de Alumnos con Discapacidad en Educación Física» (AISDPE) en alumnos pertenecientes a las etapas educativas de secundaria y bachillerato. La muestra consistió en 889 estudiantes que participaban 2 veces por semana en clases de educación física. Se realizaron pruebas de fiabilidad, análisis factorial exploratorio y confirmatorio. Se extrajo una estructura factorial con dos dimensiones (percepción cognitiva y predisposición a la acción) y 15 ítems, mostrando excelentes valores para los distintos índices de bondad de ajuste seleccionados. Además, se alcanzó una buena fiabilidad (alfa de Cronbach = 0,77-0,79). Por tanto, el AISDPE podría considerarse una medida creíble y fiable para examinar las valoraciones de los alumnos de educación física sobre sus actitudes hacia la instrucción inclusiva con el fin de mejorar el bienestar social y la salud escolar en el aula.
Palabras clave: inclusión; educación física; actitudes; validación; escala.

Abstract. The right to inclusive education is one that has drawn the attention of public organizations, scholars, and academics worldwide. Students' beliefs and perceptions are a fundamental axis to know the state of the classrooms based on this ethical principle, allowing teaching professionals to promote improvement strategies and programs. This study aims to explore the reliability and factorial structure of the questionnaire "The Attitudes towards Inclusion of Students with Disabilities in Physical Education" (AISDPE) in students belonging to the secondary and baccalaureate educational stages. The sample consisted in 889 students who participated 2 times a week in physical education classes. Reliability tests, exploratory and confirmatory factor analysis were done. Then, a factor structure with two dimension (cognitive perception and predisposition to action) and 15 items was extracted, showing excellent values for the various selected goodness-of-fit indices. Additionally, a good reliability (Cronbach's Alpha = 0.77–0.79) was attained. The AISDPE might therefore be regarded as a credible and trustworthy measure to examine physical education pupils' assessments of their attitudes towards inclusive instruction in order to improve social well-being and school health in the classroom.
Keywords: inclusion; physical education; attitudes; validation; scale

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Introduction

An urgent issue on nations' education policy agendas, inclusive education has become a prominent topic in study and professional practice (Muntaner Guasp, Rosselló Ramón, & De la Iglesia Mayol, 2016), consequently, it has been conceptualized and researched by various theoretical fields such as teaching, sociology or politics, in order to assess and meet the current needs of educational centers (Messiou, 2017). The inclusion of various groups of children, particularly those with social, emotional, or behavioral problems, continues to be viewed as problematic even though teachers are generally said to support inclusion (Hornby, 2014). Despite the undisputed tendency of most countries to follow such beneficial practices for students, segregated schooling has not declined or has very slightly decreased in several nations (European Agency For Special Needs And Inclusive Education, 2020). In this sense, experts have defined four fundamental pillars on which inclusive education must be based so that it can be implemented around the world: 1) the human rights-based perspective; 2) reaching out to underrepresented populations; 3) reforming educational systems; and 4) addressing the needs of children with disabilities (Opertti, Walker, & Zhang, 2014). Therefore, experts identify inclusive education as a project of ethical values that must be instilled in all strata of society, so that it is not just a matter of actions to be implemented in different populations, but rather of issues that each individual must assimilate and internalize (Allan, 2005). This will make it possible to achieve alignment between inclusive policies, culture and practices, leading to the elimination of barriers to learning and participation (Booth & Ainscow, 2011).

As it emerged from the special education field and was first focused on educating students with disabilities, inclusive education has expanded to include the learning of all pupils (Boyle & Sharma, 2015). Ainscow et al. (Ainscow, Booth, & Dyson, 2006) define inclusive education as a process that accommodates all children and youth in regular classes, ensuring their participation, presence and success. At a general level, it emphasizes the relevance of education systems being able to both adapt and reach all learners, adopting a socio-ecological approach on the interplay between students' capacities and environmental demands (Echeita Sarrionandia et al., 2017). Therefore, this participation not only lies in the regular classroom context but also extends to different community and extracurricular activities, since these are also included in the general curriculum, which is composed of both academic and social content (Kurth & Gross, 2015). Yet, it is hard to define inclusive education solely in terms of a location or a collection of activities because such definitions can be affected by changes in educational practice, context, culture, and other factors that quickly make these qualities outmoded and unnecessary (Forlin, Chambers, Loreman, Deppler, & Sharma, 2013). For this reason, Nilholm and Göransson (Nilholm & Göransson, 2017) came to the

conclusion that definitions of inclusion generally utilized in the literature still lack conceptual clarity.

Successful inclusion is seen to depend on the attitudes of all parties involved in the inclusive education of children with special education needs (SEN) in mainstream schools, including parents, students, teachers, school administrators, politicians, and other professionals (Nowicki & Sandieson, 2002). An emotionally charged idea that predisposes a group of behaviors with respect to a specific set of social contexts is known as an attitude (Triandis, 1971), and has been identified by the World Health Organization as an environmental factor influencing individual well-being and functioning (World Health Organization, 2001). In addition, according to this Triandis' conceptualization, these attitudes are guided by three dimensions: affective, cognitive and social (Triandis, 1971). The level of active involvement in community life that people with disabilities can have is sometimes limited by prejudice towards them, including incorrect beliefs, detrimental effects, and behavioral ignorance (Hutzler, Zach, & Gafni, 2005). Therefore, attitudinal barriers have been pointed out by experts as a field of special interest with respect to inclusive education (de Boer, Pijl, Post, & Minnaert, 2013), since the degree to which students with disabilities and/or students who receive special education supports are socially included or excluded may depend on how students in general education classes perceive disability (Freer, 2021). Students with SEN usually manifest lower levels of social participation (Schwab, 2015), showing both greater difficulties in integrating into social groups and greater feelings of loneliness with respect to their normotypical peers (Bossaert, Colpin, Pijl, & Petry, 2012), despite the fact that one of the fundamental principles of inclusive education is to ensure the social participation of all students (Bossaert, Colpin, Pijl, & Petry, 2013). In this context, the way peers view students with disabilities may be one of the key causes of the comparatively poor social participation of students with SEN in inclusive classes (Schwab, Lehofer, & Tanzer, 2021).

In order to characterize those variables and contexts that directly affect students' attitudes about students with disabilities, a stream of research has emerged to generate and implement inclusion programs as well as different pedagogical strategies. First, contact with people with disabilities has been strongly associated with more positive attitudes (Shalev, Asmus, Carter, & Moss, 2016). In this line, since they interact with them more frequently than students in ordinary classes, students in inclusive classes (where students with and without disabilities are educated together) are more likely to have good attitudes toward their peers with disabilities (Alnahdi, Schwab, Elahdi, & Alnahdi, 2021), even if this contact is of low frequency and/or intensity (Al-Kandari, 2015). On the other side, Schwab (Schwab, 2017) discovered that just having students with exceptionalities in the same learning environment was not related with more favorable attitudes about disability, but rather involving students in a voluntary collaborative activity was connected with more positive attitudes. Similarly, gender appears to be another predictor of attitudes toward people with disabilities. Generally, women express more positive attitudes towards disability compared to men (Olaleye et al., 2012). Some studies indicate that these gender differences may be affected by other mediating variables, given that when students with disabilities weren't taught in general education classes, females exhibited more positive views, whereas males showed better attitudes when these children were educated in general education classes (Adibsereshki & Salehpour, 2014). Likewise, previous studies show that the type of disability students have directly affects the perceptions that others have of them. While attitudes toward children with academic issues are more favorable, those who have socioemotional disorders are frequently the target of negative perceptions, including those of parents, instructors, and other students (Schwab, Nel, & Hellmich, 2018). Students also reported more favorable opinions about overt disabilities (sensory and physical disabilities) than toward disabilities that were less evident (intellectual and learning disabilities) (Petry, 2018). Finally, age offers divergent results in predicting attitudes toward people with disabilities. Although some studies find results that favor younger students (Blackman, 2016), others report that age is directly proportional to more positive attitudes toward disabled peers (de Laat, Freriksen, & Vervloed, 2013).

In the context of Physical Education (PE), several experts have observed that inclusion goes beyond simply having all children in the gym together during a general PE class (Haegele, 2019). All students have the chance to flourish in inclusive PE learning environments that promote diverse and individual learning and relieve them of the pressure of having to change how they learn to fit a set instructional strategy (Lieberman, Grenier, & Brian, 2019). Hence, through a variety of assistance options, fully inclusive PE learning settings give all children with different learning needs the chance to succeed in their physical, cognitive, and social-emotional development (Haegele, 2019). As a result, because PE is such a dynamic subject, children have the chance to practice social skills including playing together, waiting in line, taking turns, managing their anger, following instructions, and using acceptable forms of communication during assignments (Block, 2016). However, the majority of research done to examine the components of inclusive PE has concentrated on teachers' attitudes rather than those of students with or without disabilities (Obrusnikova, Dillon, & Block, 2011). Therefore, student self-perception scales on their attitudes towards the inclusion of peers with disabilities in the context of PE are of vital importance. Therefore, the aim of this study is to explore the psychometric properties of a scale of students' self-perception of their attitudes towards inclusion in the context of the PE classroom.

2. Materials and Methods

2.1. Participants

The sample included 889 pupils from public schools in Extremadura, Spain, who were studying at that time the stages of Compulsory Secondary Education (CSE) or Baccalaureate. Likewise, the sample had a mean age of 14.6 years with a standard deviation of 1.5 years. The individuals were all chosen using a convenience sampling approach, and Table 1 lists their sociodemographic details.

Table 1.
Participant characteristics (N = 889).

Variables	Categories	N	%
Gender	Men	423	47.6
	Women	466	52.4
Educational Stage	CSE	792	89.1
	Baccalaureate	97	10.9
Center Environment	Urban	419	47.1
	Rural	470	52.9
Contact with people with disabilities in the family context	No	220	24.7
	Yes	669	75.3
Has performed physical activity with people with disabilities	No	447	50.3
	Yes	442	49.7

N: number; %: percentage; CSE: Compulsory Secondary Education.

Instruments

First, a questionnaire was developed in order to obtain the socio-demographic characteristics of the students, including questions about gender, the educational stage to which they belonged, the environment in which the school was located and 2

questions about the contact they had had with people with disabilities in different contexts.

Next, the Spanish version of the questionnaire "The Attitudes towards Inclusion of Students with Disabilities in Physical Education" (AISDPE) (Reina Vaillo, Hutzler, Santiago, & Murcia, 2016) was administered. This questionnaire is composed by 17 items encompassed in two components: the cognitive perception (7 items) and the behavioral intention (10 items). This scale is also based on a 5-point Likert scale, being 1 "completely disagree" and 5 "completely agree". The Cronbach's Alpha coefficients for each of the AISDPE's factors were 0.82 for the cognitive, and 0.75 for the behavioral.

Procedures

The questionnaire was made using the Google Forms tool and asked questions on sociodemographics and the AISDPE scale. Because it was easier to distribute, took less time, and allowed for the storage of all responses in a single database, which raised the return rate, using an electronic questionnaire was chosen.

By acquiring access to the Department of Education and Employment's database, it was feasible to determine which institutions provide PE courses for Secondary Education through Baccalaureate (from 12 to 18 years of age). Emails were addressed to the PE teachers working at those schools asking if they could arrange a researcher visit so they could distribute the questionnaire to the students who had their parents' informed agreement. They were instructed to respond to the questions via the same channel. The study's objectives, the parents' informed consent, and the instrument models used were all described in the email. If the instructors agreed to collaborate, they had to respond to the email by setting up for a researcher to visit the school and, with the consent of the students' parents, interview the students about attitudes towards disability.

The questionnaire was initially made available to the students via a tablet, and each item was carefully presented to them one at a time so they wouldn't be doubtful when responding. The data was processed, sanitized, and anonymized once the questionnaires had all been collected so that it could be used for a second researcher's subsequent, blind study. The average response time was 10 min, and all data were collected anonymously. Data were gathered between January and February 2023. Furthermore, the valid response rate was 100% because the questionnaire had already been distributed to the pupils by the study team and the PE teacher.

Statistical Analysis

The exploratory analysis (EFA) was performed using the free statistical program FACTOR v.10.10.02 (Rovira I Virgili University: Tarragona, Spain), which took into consideration the ordinal nature of the data collected using a 5-point Likert scale. The robust unweighted least squares (RULS) approach with Promin rotation (Lorenzo-Seva & Ferrando, 2019) was used to extract the factors under the assumption that there is a correlation between the dimensions. A polychoric correlation matrix was used to determine the specific characteristics of the data, and a parallel analysis was used to establish the proper number of dimensions (Lim & Jahng, 2019). A normalized direct oblimin was used as the rotation approach to define the factor simplicity and structure after the number of dimensions had been determined. In addition, as indicators of sampling adequacy, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were utilized (Ul Hadia, Abdullah, & Sentosa, 2016).

The confirmatory factor analysis (CFA) was then performed using the AMOS v.26.0.0 software (IBM Corporation, Wexford, PA, USA). Items having crossloads higher than 0.40, communalities lower than 0.30, and loads lower than 0.30 were removed from the model (Brown, 2015). The root mean square error of approximation (RMSEA), root mean square of residuals (RMSR), non-normed fit index (NNFI), comparative fit index (CFI), and chi-square per degree of freedom ratio (CMIN/DF), were used to evaluate the model's goodness of fit (Marcoulides, 1990). Lastly, McDonald's omega and Cronbach's alpha coefficient were used to evaluate the questionnaire's final design reliability (Dunn, Baguley, & Brunsden, 2014).

Results

Table 2 presents the descriptive statistics for each of the survey responses.

Table 2.
Item-specific descriptive statistics.

Items	Mean	SD	Variance
1. I believe that people with disabilities have greater difficulty than other people in achieving the same personal and/or professional goals.	3.14	1.23	1.52
2. People with disabilities are unable to adapt to a competitive environment	4.17	1.05	1.10
3. I will stand out if I participate with people with disabilities in physical activities or sports.	3.62	1.23	1.52
4. Las personas con ceguera siempre deben recibir ayuda de un guía.	2.59	1.21	1.47
5. Students with disabilities should not participate in regular PE classes because they may be detrimental to the progress of their classmates.	4.57	0.86	0.74
6. I would not want the teacher to tell me that I have to help a person with a disability.	4.16	1.12	1.27
7. I prefer not to interact with people with disabilities.	4.49	0.94	0.88
8. If I have a family member with a disability, I will avoid talking about it with other people.	4.27	1.09	1.19
9. I would not sit in class next to a classmate with a disability.	4.68	0.74	0.56
10. I would not choose a teammate with a disability for my team.	4.28	1.00	1.00
11. I would not participate as a volunteer in a camp for people with disabilities where I would have to help them with showering, meals, etc.	3.85	1.22	1.48
12. If I had a disability, my lifestyle would change completely.	2.67	1.23	1.52
13. People with disabilities tend to be less intelligent than others.	4.09	1.02	1.04
14. In general, people with disabilities are less sociable.	3.76	1.10	1.21
15. Many people with disabilities are unable to take care of themselves.	3.15	1.19	1.41
16. People with disabilities should practice specific and independent sports.	3.84	1.16	1.36
17. If I became a wheelchair user due to an accident, my life would be meaningless.	3.93	1.17	1.37

Note: SD = Standard Deviation. Each score obtained is based on a Likert scale (1–5): 1 is "Completely disagree" and 5 "Completely agree".

The eigenvalue-based explained variance (Steger, 2006) (Table 3) and the reliability of expected a posteriori scores (EAP) (Zitzmann & Helm, 2021) allowed using the RULS approach in the first half of the sample to determine the bifactorial structure of the questionnaire, with correlation values of 0.64 between both dimensions.

Positive sample adequacy indexes results (Bartlett's test = 6907.7, df = 136, p = 0.000, and KMO test = 0.92552, respectively); allowed the EFA to be carried out. Once the number of dimensions was determined, a normalized direct oblimin rotation approach was selected because the degree of kurtosis (kurtosis = 417.996; p = 0.000) required nonparametric techniques. The rotated loading matrix for 17 items and two dimensions is shown in Table 4.

Table 3.
Eigenvalue-based explained variance, variance proportion and EAP reliability.

Variables	Eigenvalue	Proportion of Variance	EAP Reliability
1	7.07	0.42	0.96
2	1.45	0.09	0.93
3	1.21	0.07	
4	0.83	0.05	
5	0.78	0.05	
6	0.76	0.04	
7	0.69	0.04	
8	0.66	0.04	
9	0.60	0.04	
10	0.54	0.03	
11	0.46	0.03	
12	0.44	0.03	
13	0.38	0.02	
14	0.35	0.02	
15	0.30	0.02	
16	0.25	0.02	
17	0.21	0.01	

Table 4.
Rotated loading matrix extracted from EFA.

Items	Factor 1	Factor 2
1. I believe that people with disabilities have greater difficulty than other people in achieving the same personal and/or professional goals.	-0.14	0.86
2. People with disabilities are unable to adapt to a competitive environment	0.31	0.36
3. I will stand out if I participate with people with disabilities in physical activities or sports.	0.06	0.68
4. Las personas con ceguera siempre deben recibir ayuda de un guía.	-0.03	0.47
5. Students with disabilities should not participate in regular PE classes because they may be detrimental to the progress of their classmates.	0.56	0.18
6. I would not want the teacher to tell me that I have to help a person with a disability.	0.18	0.68
7. I prefer not to interact with people with disabilities.	0.82	0.01
8. If I have a family member with a disability, I will avoid talking about it with other people.	0.56	0.03
9. I would not sit in class next to a classmate with a disability.	0.83	0.01
10. I would not choose a teammate with a disability for my team.	0.85	-0.03
11. I would not participate as a volunteer in a camp for people with disabilities where I would have to help them with showering, meals, etc.	0.72	-0.06
12. If I had a disability, my lifestyle would change completely.	0.18	0.33
13. People with disabilities tend to be less intelligent than others.	0.16	0.63
14. In general, people with disabilities are less sociable.	0.43	0.17
15. Many people with disabilities are unable to take care of themselves.	0.24	0.27
16. People with disabilities should practice specific and independent sports.	0.34	0.23
17. If I became a wheelchair user due to an accident, my life would be meaningless.	0.54	0.00

Each score obtained is based on a Likert scale (1–5): 1 is "Completely disagree" and 5 "Completely agree".

After the EFA, item 2 was discarded because it had factor loadings greater than 0.3 on both factors, introducing error rates in the subsequent analyses. Similarly, item 15 did not show factor loadings higher than 0.3 in any of the dimensions, so it was eliminated. Accordingly, a factorial structure of 15 items was established, grouped into 2 factors (Table 5).

Table 5.
Factor solutions.

Items	Factor 1	Factor 2
1. I believe that people with disabilities have greater difficulty than other people in achieving the same personal and/or professional goals.		0.86
2. People with disabilities are unable to adapt to a competitive environment	Excluded	
3. I will stand out if I participate with people with disabilities in physical activities or sports.		0.68
4. Las personas con ceguera siempre deben recibir ayuda de un guía.		0.47
5. Students with disabilities should not participate in regular PE classes because they may be detrimental to the progress of their classmates.	0.56	
6. I would not want the teacher to tell me that I have to help a person with a disability.		0.68
7. I prefer not to interact with people with disabilities.	0.82	
8. If I have a family member with a disability, I will avoid talking about it with other people.	0.56	
9. I would not sit in class next to a classmate with a disability.	0.83	
10. I would not choose a teammate with a disability for my team.	0.85	
11. I would not participate as a volunteer in a camp for people with disabilities where I would have to help them with showering, meals, etc.	0.72	
12. If I had a disability, my lifestyle would change completely.		0.33
13. People with disabilities tend to be less intelligent than others.		0.63
14. In general, people with disabilities are less sociable.	0.43	
15. Many people with disabilities are unable to take care of themselves.	Excluded	
16. People with disabilities should practice specific and independent sports.	0.34	
17. If I became a wheelchair user due to an accident, my life would be meaningless.	0.54	

Each score obtained is based on a Likert scale (1–5): 1 is "Completely disagree" and 5 "Completely agree".

Additionally, Table 6 displays the polychoric correlation matrix that outlines the composition of the questionnaire.

Table 6.
Polychoric correlation matrix.

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1																
2	0.44	1															
3	0.58	0.42	1														
4	0.32	0.27	0.32	1													
5	0.35	0.48	0.43	0.23	1												
6	0.58	0.41	0.57	0.38	0.51	1											
7	0.35	0.42	0.43	0.23	0.56	0.57	1										
8	0.24	0.33	0.37	0.21	0.40	0.36	0.51	1									
9	0.33	0.44	0.40	0.24	0.61	0.56	0.73	0.51	1								
10	0.33	0.46	0.41	0.18	0.54	0..48	0.68	0.48	0.70	1							
11	0.28	0.30	0.29	0.16	0.41	0.37	0.60	0.38	0.52	0.57	1						
12	0.37	0.26	0.37	0.24	0.18	0.29	0.30	0.18	0.25	0.33	0.32	1					
13	0.54	0.41	0.50	0.31	0.47	0.73	0.45	0.29	0.54	0.45	0.31	0.28	1				
14	0.29	0.30	0.27	0.21	0.36	0.41	0.41	0.33	0.42	0.47	0.37	0.26	0.43	1			
15	0.33	0.26	0.30	0.22	0.22	0.29	0.25	0.21	0.27	0.38	0.32	0.38	0.24	0.36	1		
16	0.31	0.34	0.33	0.23	0.40	0.36	0.37	0.28	0.42	0.38	0.35	0.27	0.33	0.30	0.33	1	
17	0.19	0.30	0.23	0.10	.36	0.27	0.39	0.2	0.42	0.44	0.39	0.42	0.33	0.33	0.31	0.24	0.1

The remaining half of the sample was used in the CFA to develop a final model after the structure of the questionnaire was defined (Figure 1).

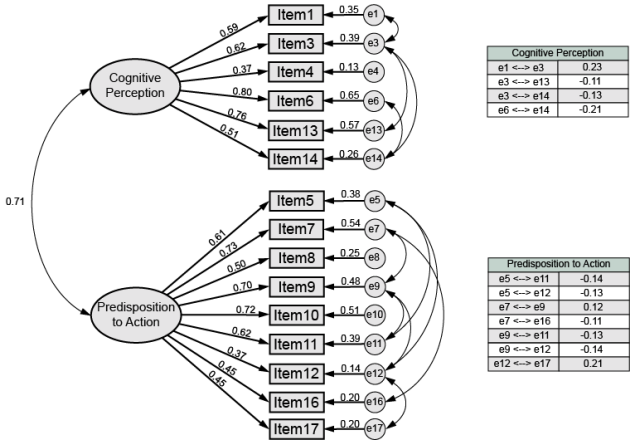

Figure 1. Scale factorization model.

The questionnaire's final design, which had 15 items split into two variables, is depicted in Figure 1. The values for correlation between factors, normalized regression weights, squared multiple correlations of each variable, and correlations between exogenous variables (tables) are displayed in the figure, from left to right.

Following the CFA, the instrument's goodness-of-fit indices, which are shown in Table 7, showed a good fit between the data and the model (Maydeu-Olivares, Fairchild, & Hall, 2017). The RMSR (at less than 0.08) qualified as accurate, and the RMSEA was within the acceptable range (0.010-0.050). Also, values of the NNFI and CFI greater than 0.9 indicated a satisfactory fit to the model. Finally, given that a model fit was considered to be adequate when the CMIN/DF index was less than 3, it too displayed outstanding values.

Finally, the Dimension 1 (predisposition to action) reported reliability values of 0.77 for both Cronbach's alpha and McDonald's omega. Similarly, the second dimension found satisfactory reliability values (0.79 for both indices).

Table 7.
Goodness-of-fit indices.

Indices	Value
RMSEA	0.049
RMSR	0.057
NNFI	0.935
CFI	0.954
CMIN/DF	2.905

RMSEA: root mean square error of approximation; RMSR: root mean square of residuals; NNFI: non-normed fit index; CFI: comparative fit index; CMIN/DF: minimum discrepancy per degree of freedom.

Discussion

The main objective of the present research was to evaluate the psychometric properties as well as the validity and internal reliability issues of a questionnaire aimed at analyzing the attitudes towards inclusion of students with disabilities in the context of PE in students belonging to CSE and Baccalaureate, whose schools are in Extremadura (Spain). The findings revealed a factor structure composed of two related dimensions and 15 items with excellent goodness-of-fit indices. Moreover, satisfactory levels of consistency were shown by the Cronbach's alpha and McDonald's omega values. The original questionnaire composed of 17 items divided into two factors was validated for its application in PE classes at the CSE (Reina Vaillo et al., 2016).

Regarding the translation, development and/or validation of educational tools whose focus of study is to assess student attitudes about inclusion in the EF classroom, there are numerous studies in the Spanish and international context with different results. For example, Ocete-Calvo et al. (Ocete Calvo, Pérez-Tejero, Franco, & Coterón, 2017) translated into Spanish and explored the construct validity of the "Children Attitude Integrated Physical Education-Revised" (CAIPE-R) questionnaire in CSE and Baccalaureate students in three public schools in the Spanish capital, reducing the scale to 10 items due to the low saturation of the items, mainly due to the small sample size of the study. Likewise, the goodness-of-fit indicators after the CFA presented values that could be considered borderline to confirm their construct validity. Similarly, Iñiguez-Santiago et al. (Iñiguez Santiago, Ferriz, Martínez Galindo, Cebrián Sánchez, & Reina Vaillo, 2017) developed a questionnaire composed of 8 items that addressed student attitudes towards disability in the context of PE

from a behavioral and cognitive perspective in CSE and Baccalaureate students (EAADEF), whose final model ended up including 4 questions that analyzed both components in a single factor. This reduced version showed good internal consistency and reliability values, as well as positive findings in terms of model invariance as a function of gender and contact with people with disabilities. Subsequently, Abellán-Hernández and colleagues (Abellán Hernández, Ferriz Morell, Sáez Gallego, & Reina Vaíllo, 2020) explored the psychometric properties of this scale in primary school students, finding similar results to the initial validation, and confirming its invariance regardless of gender, course or previous participation of students in PA with people with disabilities.

There is also another series of educational tools that, despite sharing the same focus of analysis as the previous ones, their validity and reliability properties have not been as extensively explored. In the 1980s, Rosembaum et al. (Rosenbaum, Armstrong, & King, 1986) developed one of the first scales aimed at determining students' attitudes towards their peers with disabilities in the school environment: the Chedoke-McMaster Attitudes Towards Children with Handicaps Scale (CATCH). This scale was composed of 36 items that in groups of 12 analyzed the affective, cognitive and behavioral dimensions of attitudes towards disability, however, both the reliability values and those obtained in the CFA were not satisfactory, despite confirming the longitudinal invariance of the scale and its ability to discriminate on the basis of sex and familiarity with disability. But it was not until 2017 when it was translated into the Spanish language, serving as an evaluation method for the improvement produced by different disability awareness programs in PE (Rello, Puerta, & Tejero-González, 2018), but which did not get to be validated conveniently. Later, a reduced Spanish version of the CATCH (Felipe-Rello, Tejero-González, & Garoz Puerta, 2020), consisting of 6 items, was proposed, obtaining good values of internal consistency and temporal stability.

Equally, attitudes towards disability have been studied in other educational stages such as university, although the development of tools is more precarious. Suriá-Martínez and his team (Suriá Martínez, Ordóñez Rubio, & Martínez Maciá, 2015) were one of the first groups in Spain to address this gap in the scientific literature, developing and validating a 10-item scale that analyzed opinions on happiness, sexuality or friendship of people with disabilities. This trend was continued in Spanish-speaking South American countries, where the Questionnaire on Attitudes towards Disability in Higher Education (QAD-HE) (Fuentes, Pérez-Padilla, De La Fuente, & Aranda, 2022) was developed and validated, achieving excellent validation values. In this way, the possibility was opened to explore which are the barriers and facilitators of the university context for the inclusion of people with disabilities.

Limitation and Future Lines of Research

As in any research, there are several limiting aspects. First of all, the educational stages in which attitudes towards disability in PE are explored are only CSE and Baccalaureate, leaving out primary education, which has already been pointed out by several studies as an essential time to start carrying out awareness programs that greatly improve the perception towards disability (Freer, 2021). Similarly, the non-randomization of the sample gives rise to the need to interpret the results cautiously. Likewise, all participants lived at the time of the study in the same Autonomous Community, so there are sociodemographic and psychological variables that can modify the responses.

As future lines of research, it is proposed to explore the psychometric properties of the scale in all educational stages of the national education system, from primary to university education. It would also be convenient to evaluate questions of invariance according to the different sociodemographic characteristics of the sample and their contact or not with people with disabilities in their daily lives. Finally, the collaboration of different research groups is required to extend these analyses to the entire Spanish territory.

Conclusions

In the current study, the validity and reliability of a questionnaire that was used to assess students' views toward inclusion in the PE context were examined. Our findings demonstrated that a solution with 15 elements and two dimensions had consistent goodness-of-fit indicators and satisfactory reliability ratings. Because it is a quick, simple tool that guarantees high rates of return from students, this instrument is appropriate for administration in the educational setting for both training and research reasons. In this way, all professionals involved in PE can establish the current level of their students and adapt programs, interventions and pedagogical strategies to the characteristics shown by the students.

Therefore, the Ef classroom becomes an ideal environment to improve attitudes towards disability, transforming their ideals and generating transfer to everyday life contexts in order to contribute to social well-being and optimum school health.

Author Contributions

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Institutional Review Board Statement

The use of these data did not require approval from an accredited ethics committee, as they are not covered by data protection principles, i.e., they are non-identifiable, anonymous data collected through an anonymous survey for teachers. In addition, based on Regulation (EU) 2016/679 of the European Parliament and of the Council on 27 April 2016 on the protection of individuals concerning the processing of personal data and on the free movement of such data (which entered into force on 25 May 2016 and has been compulsory since 25 May 2018), data protection principles do not need to be applied to anonymous information (i.e., information related to an identifiable natural person, nor to data of a subject that is not, or is no longer, identifiable). Consequently, the Regulation does not affect the processing of our information. Even for statistical or research purposes, its use does not require the approval of an accredited ethics committee.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The datasets are available through the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

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References

Abellán Hernández, J., Ferriz Morell, R., Sáez Gallego, N. M., & Reina Vaíllo, R. (2020). Actitudes hacia el alumnado con discapacidad en educación física: Validación de la EAADEF-EP a la etapa de educación primaria. *Cultura, ciencia y deporte*, *15*(44), 235-243. Recuperado de https://dialnet.unirioja.es/servlet/articulo?codigo=7427870

Adibsereshki, N., & Salehpour, Y. (2014). Peer acceptance of students with and without inclusion experience towards students with special needs in unisex schools of Tehran. *Education 3-13*, *42*(6), 575-588. https://doi.org/10.1080/03004279.2012.745890

Ainscow, M., Booth, T., & Dyson, A. (2006). *Improving Schools, Developing Inclusion* (1.ª ed.). Routledge. https://doi.org/10.4324/9780203967157

Al-Kandari, H. Y. (2015). High School Students' Contact with and Attitudes towards Persons with Intellectual and Developmental Disabilities in Kuwait. *Australian Social Work*, *68*(1), 65-83. https://doi.org/10.1080/0312407X.2014.946429

Allan, J. (2005). Inclusion as an Ethical Project. En S. Tremain (Ed.), *Foucault and the Government of Disability* (pp. 281-297). University of Michigan Press.

Alnahdi, G. H., Schwab, S., Elahdi, A., & Alnahdi, A. H. (2021). The Positive Impact of Joint Activities on Students Attitudes Toward Peers With Disabilities. *Frontiers in Psychology*, *12*, 690546. https://doi.org/10.3389/fpsyg.2021.690546

Blackman, S. (2016). Barbadian Students' Attitudes towards Including Peers with Disabilities in Regular Education. *International Journal of Special Education*, *31*(1), 135-143. Recuperado de https://eric.ed.gov/?id=EJ1099987

Block, M. E. (2016). *A teacher's guide to adapted physical education: Including students with disabilities in sports and recreation, fourth edition* (Fourth edition). Baltimore, MD: Brookes Publishing.

Booth, T., & Ainscow, M. (2011). *Index for inclusion: Developing learning and participation in schools* (3. ed., substantially revised and expanded). Bristol: Centre for Studies on Inclusive Education.

Bossaert, G., Colpin, H., Pijl, S. J., & Petry, K. (2012). Loneliness among students with special educational needs in mainstream seventh grade. *Research in Developmental Disabilities*, *33*(6), 1888-1897. https://doi.org/10.1016/j.ridd.2012.05.010

Bossaert, G., Colpin, H., Pijl, S. J., & Petry, K. (2013). Truly included? A literature study focusing on the social dimension of inclusion in education. *International Journal of Inclusive Education*, *17*(1), 60-79. https://doi.org/10.1080/13603116.2011.580464

Boyle, C., & Sharma, U. (2015). Inclusive education—Worldly views? *Support for Learning*, *30*(1), 2-3. https://doi.org/10.1111/1467-9604.12077

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (Second edition). New York ; London: The Guilford Press.

de Boer, A., Pijl, S. J., Post, W., & Minnaert, A. (2013). Peer Acceptance and Friendships of Students with Disabilities in General Education: The Role of Child, Peer, and Classroom Variables. *Social Development*, *22*(4), 831-844. https://doi.org/10.1111/j.1467-9507.2012.00670.x

de Laat, S., Frerikse, E., & Vervloed, M. P. J. (2013). Attitudes of children and adolescents toward persons who are deaf, blind, paralyzed or intellectually disabled. *Research in Developmental Disabilities*, *34*(2), 855-863. https://doi.org/10.1016/j.ridd.2012.11.004

Dunn, T. J., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British journal of psychology*, *105*(3), 399-412.

Echeita Sarrionandia, G., Simón Rueda, C., Márquez Vázquez, C., Fernández Bláz, M. L. D. los M., Pérez De La Merced, E., & Moreno Hernández, A. (2017). Análisis y valoración del Área de Educación del III Plan de Acción para Personas con Discapacidad en la Comunidad de Madrid (2012-2015). *Siglo Cero. Revista Española sobre Discapacidad Intelectual*, *48*(1), 51. https://doi.org/10.14201/scero2017485171

European Agency For Special Needs And Inclusive Education. (2020). *European Agency Statistics on Inclusive Education: 2018 Dataset Cross-Country Report*. Zenodo. https://doi.org/10.5281/ZENODO.5562166

Felipe-Rello, C., Tejero-González, C. M. ª, & Garoz Puerta, I. (2020). Escala CATCH: Validación de una versión reducida traducida al español para la medición de actitudes hacia la discapacidad. *Bordón. Revista de Pedagogía*, *72*(2), 83-97. https://doi.org/10.13042/Bordon.2020.72825

Forlin, C., Chambers, D., Loreman, T., Deppler, J., & Sharma, U. (2013). Inclusive education for students with disability: A review of the best evidence in relation to theory and practice. *Education Papers and Journal Articles*. Recuperado de https://researchonline.nd.edu.au/edu_article/141

Freer, J. R. R. (2021). Students' attitudes toward disability: A systematic literature review (2012–2019). *International Journal of Inclusive Education*, 1-19. https://doi.org/10.1080/13603116.2020.1866688

Fuentes, V., Pérez-Padilla, J., De La Fuente, Y., & Aranda, M. (2022). Creation and validation of the Questionnaire on Attitudes towards Disability in Higher Education

(QAD-HE) in Latin America. *Higher Education Research & Development*, *41*(5), 1514-1527. https://doi.org/10.1080/07294360.2021.1927997

Haegele, J. A. (2019). Inclusion Illusion: Questioning the Inclusiveness of Integrated Physical Education: 2019 National Association for Kinesiology in Higher Education Hally Beth Poindexter Young Scholar Address. *Quest*, *71*(4), 387-397. https://doi.org/10.1080/00336297.2019.1602547

Hornby, G. (2014). *Inclusive special education: Evidence-based practices for children with special needs and disabilities*. New York, NY: Springer.

Hutzler, Y., Zach, S., & Gafni, O. (2005). Physical education students' attitudes and self-efficacy towards the participation of children with special needs in regular classes. *European Journal of Special Needs Education*, *20*, 309-327. https://doi.org/10.1080/08856250500156038

Iñiguez Santiago, M. del C., Ferriz, R., Martínez Galindo, M. C., Cebrián Sánchez, M. M., & Reina Vaillo, R. (2017). Análisis factorial de la escala de actitudes hacia el alumnado con discapacidad en educación física (EAADEF). *Psychology, Society & Education*, *9*(3), 493-504. https://doi.org/10.25115/psye.v9i3.652

Kurth, J. A., & Gross, M. (2015). *The inclusion toolbox: Strategies and techniques for all teachers*. Thousand Oaks, California: Corwin.

Lieberman, L. J., Grenier, M., & Brian, A. (2019). How Inclusive Is Your Physical Education Class? Introducing the Lieberman/Brian Inclusion Rating Scale for Physical Education. *Journal of Physical Education, Recreation & Dance*, *90*(2), 3-4. https://doi.org/10.1080/07303084.2019.1548179

Lim, S., & Jahng, S. (2019). Determining the number of factors using parallel analysis and its recent variants. *Psychological Methods*, *24*, 452-467. https://doi.org/10.1037/met0000230

Lorenzo-Seva, U., & Ferrando, P. J. (2019). Robust Promin: A method for diagonally weighted factor rotation. *Liberabit: Revista Peruana de Psicología*, *25*(1), 99-106. https://doi.org/10.24265/liberabit.2019.v25n1.08

Marcoulides, G. A. (1990). Evaluation of Confirmatory Factor Analytic and Structural Equation Models Using Goodness-of-Fit Indices. *Psychological Reports*, *67*(2), 669-670. https://doi.org/10.2466/pr0.1990.67.2.669

Maydeu-Olivares, A., Fairchild, A. J., & Hall, A. G. (2017). Goodness of Fit in Item Factor Analysis: Effect of the Number of Response Alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *24*(4), 495-505. https://doi.org/10.1080/10705511.2017.1289816

Messiou, K. (2017). Research in the field of inclusive education: Time for a rethink? *International Journal of Inclusive Education*, *21*(2), 146-159. https://doi.org/10.1080/13603116.2016.1223184

Muntaner Guasp, J. J., Rosselló Ramón, M. R., & De la Iglesia Mayol, B. (2016). Buenas prácticas en educación inclusiva. *Educatio Siglo XXI*, *34*(1 Marzo), 31. https://doi.org/10.6018/j/252521

Nilholm, C., & Göransson, K. (2017). What is meant by inclusion? An analysis of European and North American journal articles with high impact. *European Journal of Special Needs Education*, *32*(3), 437-451. https://doi.org/10.1080/08856257.2017.1295638

Nowicki, E. A., & Sandieson, R. (2002). A Meta-Analysis of School-Age Children's Attitudes Towards Persons with Physical or Intellectual Disabilities. *International Journal of Disability, Development and Education*, *49*(3), 243-265. https://doi.org/10.1080/1034912022000007270

Obrusnikova, I., Dillon, S. R., & Block, M. E. (2011). Middle School Student Intentions to Play with Peers with Disabilities in Physical Education: Using the Theory of Planned Behavior. *Journal of Developmental and Physical Disabilities*, *23*(2), 113-127. https://doi.org/10.1007/s10882-010-9210-4

Ocete Calvo, C., Pérez-Tejero, J., Franco, E., & Coterón, J. (2017). Validación de la versión española del cuestionario "Actitudes de los alumnos hacia la integración en educación física (CAIPE-R)". *Psychology, Society & Education*, *9*(3), 447-458. https://doi.org/10.25115/psye.v9i3.1025

Olaleye, A., Ogundele, O., Deji, S., Ajayi, O., Olaleye, O., & Adeyanju, T. (2012). Attitudes of Students towards Peers with Disability in an Inclusive School in Nigeria. *Disability, CBR & Inclusive Development*, *23*(3), 65. https://doi.org/10.5463/dcid.v23i3.136

Opertti, R., Walker, Z., & Zhang, Y. (2014). *Inclusive education: From targeting groups and schools to achieving quality education as the core of EFA*. Recuperado de https://repository.nie.edu.sg/handle/10497/17344

Petry, K. (2018). The relationship between class attitudes towards peers with a disability and peer acceptance, friendships and peer interactions of students with a disability in regular secondary schools. *European Journal of Special Needs Education*, *33*(2), 254-268. https://doi.org/10.1080/08856257.2018.1424782

Reina Vaillo, R., Hutzler, Y., Santiago, M. C. I., & Murcia, J. A. M. (2016). Attitudes towards Inclusion of Students with Disabilities in Physical Education Questionnaire (AISDPE): A two-component scale in Spanish. *European Journal of Human Movement*, *36*, 75-87. Recuperado de http://eurjhm.com/index.php/eurjhm/article/view/368

Rello, C. F., Puerta, I. G., & Tejero-González, C. M. (2018). Análisis comparativo del efecto de tres programas de sensibilización hacia la discapacidad en Educación Física. *Retos: nuevas tendencias en educación física, deporte y recreación*, (34), 258-262. Recuperado de https://dialnet.unirioja.es/servlet/articulo?codigo=6736321

Rosenbaum, P. L., Armstrong, R. W., & King, S. M.

(1986). Children's Attitudes Toward Disabled Peers: A Self-Report Measure. *Journal of Pediatric Psychology*, *11*(4), 517-530. https://doi.org/10.1093/jpepsy/11.4.517

Schwab, S. (2015). Social dimensions of inclusion in education of 4th and 7th grade pupils in inclusive and regular classes: Outcomes from Austria. *Research in Developmental Disabilities*, *43-44*, 72-79. https://doi.org/10.1016/j.ridd.2015.06.005

Schwab, S. (2017). The impact of contact on students' attitudes towards peers with disabilities. *Research in Developmental Disabilities*, *62*, 160-165. https://doi.org/10.1016/j.ridd.2017.01.015

Schwab, S., Lehofer, M., & Tanzer, N. (2021). The Impact of Social Behavior and Peers' Attitudes Toward Students With Special Educational Needs on Self-Reported Peer Interactions. *Frontiers in Education*, *6*, 561662. https://doi.org/10.3389/feduc.2021.561662

Schwab, S., Nel, M., & Hellmich, F. (2018). Social participation of students with special educational needs. *European Journal of Special Needs Education*, *33*(2), 163-165. https://doi.org/10.1080/08856257.2018.1424784

Shalev, R. A., Asmus, J. M., Carter, E. W., & Moss, C. K. (2016). Attitudes of High School Students toward their Classmates with Severe Disabilities: A Pilot Study. *Journal of Developmental and Physical Disabilities*, *28*(4), 523-538. https://doi.org/10.1007/s10882-016-9489-x

Steger, M. F. (2006). An Illustration of Issues in Factor Extraction and Identification of Dimensionality in Psychological Assessment Data. *Journal of Personality Assessment*, *86*(3), 263-272. https://doi.org/10.1207/s15327752jpa8603_03

Suriá Martínez, R., Ordóñez Rubio, T., & Martínez Maciá, D. (2015). Validación de la escala actitudinal hacia la discapacidad entre los estudiantes universitarios. *XIII Jornadas de Redes de Investigación en Docencia Universitaria: nuevas estrategias organizativas y metodológicas en la formación universitaria para responder a la necesidad de adaptación y cambio, 2015, ISBN 978-84-606-8636-1, págs. 2612-2621*, 2612-2621. Instituto de Ciencias de la Educación. Recuperado de https://dialnet.unirioja.es/servlet/articulo?codigo=5903035

Triandis, H. C. (1971). *Attitude and attitude change*. New York: Wiley.

Ul Hadia, N., Abdullah, N., & Sentosa, I. (2016). An Easy Approach to Exploratory Factor Analysis: Marketing Perspective. *Journal of Educational and Social Research*. https://doi.org/10.5901/jesr.2016.v6n1p215

World Health Organization (Ed.). (2001). *International classification of functioning, disability and health: ICF*. Geneva: World Health Organization.

Zitzmann, S., & Helm, C. (2021). Multilevel Analysis of Mediation, Moderation, and Nonlinear Effects in Small Samples, Using Expected a Posteriori Estimates of Factor Scores. *Structural Equation Modeling: A Multidisciplinary Journal*, *28*(4), 529-546. https://doi.org/10.1080/10705511.2020.1855076

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