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Raising awareness about people with disabilities among primary school pupils: impact of an educational intervention

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Introduction: Educational inclusion remains one of the foremost challenges in schools, where fostering inclusive attitudes towards disability is essential for building fairer and more participatory environments. School-based interventions are a key strategy for raising awareness among pupils.
Methods: The impact of an inclusive educational intervention was assessed with 287 pupils in Years 4 to 6 of primary education from six schools in the Basque Country. A quasi-experimental pre–post design was employed. Attitudes toward disability were measured using a validated Basque-language scale comprising 10 items assessing cognitive, affective, and behavioural dimensions. Data were analysed using non-parametric statistical procedures. The programme lasted 10 hours and included five sessions addressing inclusion, sensory, physical, and cognitive disabilities, as well as rare diseases, using testimonial videos, comic-style materials, and awareness-raising games.
Results: A significant improvement was observed in the cognitive dimension and in overall awareness. However, no notable changes were found in the affective and behavioural dimensions. Girls scored higher across all dimensions of the scale.
Discussion: The intervention proved effective in improving pupils' knowledge and understanding of disability. It is recommended that similar programmes be integrated into school guidance and counselling frameworks to further enhance affective and behavioural dimensions of inclusion.

KEYWORDS
attitudes, awareness, disability, educational intervention, impact

1 Introduction

Educational inclusion has become one of the core principles of today's school systems, aiming to ensure quality education for all pupils, regardless of their personal characteristics or specific needs (Jardinez and Natividad, 2024). In general terms, inclusion refers to the process of responding to learner diversity by removing barriers to learning and participation, ensuring equitable access to educational opportunities, and promoting the active participation of all students within mainstream educational settings (Ainscow, 2020). It involves not only structural adjustments but also cultural and pedagogical changes that recognise diversity as a natural and enriching feature of educational communities (Bindhani and Gopinath, 2024). In line with contemporary perspectives, inclusion is understood not merely as physical placement or access to

mainstream settings, but as the development of a meaningful sense of belonging and participation within the group (Haegele and Maher, 2023). From this standpoint, inclusive education involves ensuring that all students, including those with disabilities, feel valued, respected, and socially integrated in everyday school life.

However, for inclusion to transcend the normative and structural levels, it is essential to promote a change in the attitudes of the educational community towards people with disabilities (Ramírez-Solórzano and Herrera-Navas, 2024). Attitudes towards disability begin to form in childhood and can be influenced through meaningful educational experiences (Aguado et al., 2004). The period of childhood is crucial for instilling social values, as the first notions of justice, empathy, and acceptance of difference are developed during this stage (Aguado et al., 2008). Therefore, early intervention within the school environment is essential to prevent the reinforcement of stereotypes and prejudices against those with disabilities, while encouraging the development of positive and prosocial attitudes.

Encouraging inclusive attitudes from an early age aligns with international guidelines on inclusive education, such as those established by the United Nations Educational, Scientific and Cultural Organization (Organización de las Naciones Unidas para la Educación la Ciencia y la Cultura [Unesco], 2020), which emphasise the need to provide equitable, inclusive, and quality education (Organización de las Naciones Unidas para la Educación la Ciencia y la Cultura [UNESCO], 2020). In the Spanish context, Organic Law 3/2020 of 29 December, amending the Organic Law on Education (LOMLOE, Article 1.b), reinforces this commitment, highlighting the importance of promoting values of respect, coexistence, and diversity in education. However, for these principles to be put into practice in schools, educational programmes must be designed that are capable of generating real changes in attitudes, i.e., in the way pupils perceive, feel about, and act towards disability.

The literature has established that attitudes towards disability have a three-dimensional structure, involving three interrelated components (Babik and Gardner, 2021; Freer, 2022; González-Rojas and Triana-Fierro, 2018). The cognitive component refers to the knowledge, beliefs, and perceptions that individuals hold about people with disabilities, indicating their level of understanding and the presence of stereotypical or realistic ideas. The affective component is tied to the emotions and feelings—such as empathy, fear, or discomfort—that those with disabilities elicit in others. Finally, the behavioural component encompasses the willingness to interact or engage with individuals with disabilities, including both intentions and observable behaviours in social or educational contexts. It is essential to understand this structure when designing educational interventions that comprehensively address the different dimensions of attitude, fostering not only knowledge but also emotional engagement and an active disposition towards inclusion.

Schools, which are considered privileged spaces for socialisation, thus offer a unique opportunity to influence these attitudes, provided that appropriate pedagogical strategies are applied (Álvarez-Delgado et al., 2021). In this context, disability awareness is defined as the educational process through which greater understanding, empathy, and an inclusive attitude towards people with disabilities are promoted among pupils (Kelen et al., 2025). This process involves challenging stereotypes, reducing prejudice, and encouraging a fairer and more respectful perception of disability (Pelleboer-Gunnink et al., 2021; Rohmer and Louvet, 2018). Beyond merely providing information, awareness-raising seeks to evoke emotions and promote an active disposition towards inclusion, making it an indispensable tool for creating more equitable and supportive educational environments (Lindsay and Edwards, 2013). The literature has recognised the importance of this approach, especially when framed within an experiential and participatory method adapted to pupils' development (Luarte-Rocha et al., 2023; Uria-Olaizola et al., 2025). School programmes designed to raise awareness about disability can serve as a basis for creating strategies and approaches that encourage the inclusion of pupils with disabilities (Kelen et al., 2025), which is essential for developing an inclusive mindset.

Along these lines, Felipe et al. (2018) highlight five pedagogical approaches that have the potential to positively influence how disability is perceived: (1) facilitating direct or indirect contact with people with disabilities; (2) providing accurate and adapted information; (3) using persuasive messages that foster critical reflection; (4) implementing simulations that allow participants to experience the barriers faced by these individuals; and (5) promoting group reflection through participatory dynamics. According to the available empirical evidence, although interventions in school settings tend to improve the cognitive understanding of disability, their effects on the affective and behavioural dimensions are more modest and less sustainable over time (Víquez et al., 2020). Moreover, many programmes have been developed for secondary or higher education (Uria-Olaizola et al., 2025), with less focus given to primary education, despite this being a crucial stage for shaping attitudes.

Despite the growing body of research on attitudes toward disability in childhood (Wüthrich et al., 2024), there is still limited empirical evidence examining the impact of structured, school-based awareness interventions implemented in real educational contexts, particularly in primary education. Moreover, previous studies have reported mixed findings regarding the influence of personal and contextual variables on children's attitudes toward disability. In response to these gaps in the literature, the present study explores the impact of a structured educational intervention aimed at raising disability awareness among primary school pupils. Specifically, the study addresses the following research questions: Does a structured educational intervention aimed at raising disability awareness lead to significant changes in primary school pupils' attitudes toward people with disabilities, considering the cognitive, affective, and behavioural dimensions of attitude? To what extent are post-intervention levels of disability awareness associated with personal and contextual variables such as gender, school year, type of school, family characteristics and prior contact with people with disabilities?

Within this framework, and given the need to continue researching how children's attitudes towards disability are formed (Bárcena et al., 2018), this study aims to assess the impact of an inclusive educational intervention on the awareness about disability among primary school pupils in Years 4 to 6, exploring the three components of attitude: cognitive, affective, and behavioural. For this purpose, two specific objectives were established. The first involved implementing a multi-component

educational intervention that combined information, indirect contact, simulations, group reflection, and an analysis of its impact. The second objective was to examine the role that personal and contextual variables such as sex, family type, school year, type of school, and prior contact with people with disabilities played in influencing awareness after the intervention, to better understand previous study findings (Aguado et al., 2008). Thus, the aim is to provide a comprehensive overview of the factors that foster the development of inclusive attitudes among primary school pupils in the Basque Country.

2 Materials and methods

2.1 Participants

The sample comprised 287 pupils aged 9 to 12 (M = 9.7) from six schools in two locations in the Basque Country, Spain. It was obtained through convenience sampling, according to the availability of schools and their willingness to participate (Gertler et al., 2017; Vehobar et al., 2016). Specifically, the sample came from six Model D schools, where Basque is the main language. Of the total number of participants, 157 were girls (54.7%) and 130 were boys (45.3%). Regarding educational levels, 154 pupils were in Year 4 of primary education (53.7%), 69 in Year 5 (24%), and 64 in Year 6 (22.3%). Table 1 offers further information about the sample.

TABLE 1 Description of the sample.

Variable	*N* = 287	%
Sex		
Femenine	157	54.7%
Masculine	130	45.3%
School year		
Year 4	154	53.7%
Year 5	69	24%
Year 6	64	22.3%
Type of school		
State	187	65.2%
State-subsidised	100	34.8%
Family		
Only child	26	9.1%
Siblings	261	90.9%
Prior contact		
Family member: Yes	64	22.3%
Family member: No	223	77.7%
Classmate: Yes	122	42.5%
Classmate: No	165	57.5%
Friend: Yes	98	34.1%
Friend: No	189	65.9%
Leisure: Yes	95	33.1%
Leisure: No	192	66.9%

The study was approved by the Ethics Committee of the university to which the research team belongs (code ETK-68/23-24). Prior to data collection, written informed consent was obtained from the families of all participating pupils. Confidentiality, anonymity, and voluntary participation were guaranteed at all times, in accordance with ethical standards for research involving minors.

2.2 Instruments

Attitudes towards people with disabilities were assessed using a combined scale adapted and validated into Basque (Uria-Olaizola et al., in press), consisting of items from the CATCH-TSG (Chedoke-McMaster attitudes towards children with handicaps scale for traditional sporting games; March-Llanes et al., 2023) and EAADEF-EP (Attitudes toward students with disabilities in physical education: Validation of the EAADEF-EP to the stage of primary education; Abellán et al., 2020). The final version of the instrument consisted of 10 items. The scale includes three dimensions, of which the first represents the cognitive aspect. This measures knowledge and beliefs about people with disabilities and consists of four items, such as: "I would like to have a classmate with a disability in my group." The second is the affective dimension, which measures emotions and feelings towards people with disabilities, and includes three items, for instance: "When doing schoolwork, I would try to stay away from a child with a disability." The last dimension concerns the behavioural component and measures the willingness to interact or engage with people with disabilities. It consists of three items, for example: "I would avoid doing classwork with a person with a disability."

The items are presented in a 5-point Likert format (1 = strongly disagree; 5 = strongly agree) and have demonstrated adequate psychometric properties in previous studies (Abellán et al., 2020; March-Llanes et al., 2023). In the present study, confirmatory factor analysis indicated an acceptable overall fit: $\chi^2 = 104$, $p < .001$; CFI = 0.903; TLI = 0.864; SRMR = 0.0578; RMSEA = 0.088, supporting the internal consistency and construct validity of the scale for the sample analysed.

In addition to the attitude scale, various personal and contextual variables relevant to the analysis of awareness were collected: prior contact with people with disabilities in various contexts (family member, friends, classmates, and leisure or free time activities), sociodemographic variables such as sex, school year, family type (only child or with siblings), and type of school (state or state-subsidised).

2.3 Procedure

The intervention was designed by an association of families committed to the inclusion of people with disabilities, with the guidance of researchers in the field. First, the programme was proposed to the town councils of the participating municipalities, which approved and supported the initiative. Next, it was presented to the six schools involved, which voluntarily agreed to implement it.

Following the institutional validation phase, fieldwork began. The schools were informed of the research objectives, and informed consent was obtained from the families. Data collection was conducted using an online questionnaire (Google Forms) at two points in time: before the programme began (pre-test) and after the last session (post-test).

The information was gathered from September to December 2024, with the research team present at all sessions to ensure conditions were applied consistently and to resolve any technical issues. The programme was implemented by two specialised professionals, who had been previously trained by the association responsible for designing the intervention. The class teacher was also present at all sessions.

The intervention lasted a total of 10 h, divided into five two-hour sessions per day. A specific topic related to disability was the focus of each session: (1) inclusion, (2) sensory disability, (3) physical disability, (4) cognitive and developmental disability, and (5) rare diseases. Each session was structured into two complementary blocks. The first was a theoretical-reflective block featuring the screening of a video specifically created for the project, where people with disabilities or their family members shared personal accounts and everyday experiences related to the theme of the day. To accompany these materials, each pupil received an individual educational guide, presented in a comic-style format that was accessible and visually appealing. It provided simple, structured information on each disability, alongside questions for reflection designed to encourage critical thinking and empathy. The second part of each session included a practical-experiential block, consisting of awareness-raising activities and games that allowed pupils to experience, in a fun and participatory way, some of the barriers faced by people with disabilities. The intervention drew on the awareness-raising approaches proposed by Felipe et al. (2018), combining indirect contact, adapted information, persuasive messages, disability simulations, and group reflection (see Table 2).

All activities were tailored to pupils' cognitive, emotional, and social development stage, using accessible language, relatable examples, and play-based methodologies that facilitated understanding and meaningful learning. The goal of the intervention was therefore to enhance knowledge, engage emotions, and foster a willingness to act inclusively, which are cornerstones of awareness-raising in schools.

2.4 Data analysis

A quasi-experimental design was used (Montero and León, 2007) with pre-test and post-test measures and without a control group, to evaluate the impact of an inclusive educational intervention on pupils' attitudes towards people with disabilities. Data were coded, cleaned, and analysed using the Jamovi statistical programme (version 2.3.18.). After data collection, the consistency of responses was verified, and cases with missing post-test values were eliminated, resulting in a final sample of 287 participants, representing a loss of 8.6% compared to the pre-test ($N = 314$), primarily due to absences during the second measurement.

First, descriptive analyses were conducted to characterise the sample and examine the distribution of the main personal and contextual variables (sex, year group, type of school, family type, and prior contact). Next, the impact of the educational intervention was evaluated by comparing the scores obtained in the pre-test and post-test across the three dimensions of attitude (cognitive, affective, and behavioural) and overall awareness. The assumption of normality was assessed using the Kolmogorov–Smirnov test, which evaluates the null hypothesis that the data follow a normal distribution (Lilliefors, 1967). Results showed significant deviations from normality in all variables ($p \leq .05$), indicating that the distributions differed significantly from normality. Consequently, non-parametric procedures were applied. Specifically, the Wilcoxon signed-rank test for related

TABLE 2 Structure and content of the 10-hour educational intervention.

Session	Topic	Educational Objective	Theoretical–Reflective Component	Practical–Experiential Component
1	Inclusion	To introduce the concept of inclusion and promote reflection on diversity and individual differences.	Group discussion and guided reflection on diversity and uniqueness.	Personal-identification dynamic in which pupils stepped forward when identifying with specific characteristics, illustrating that everyone is different and that inclusion involves valuing diversity.
2	Sensory disability	To increase understanding of visual and hearing impairments and associated communication barriers.	Viewing of testimonial videos about visual and hearing disabilities, followed by guided discussion.	Adapted "broken telephone" game using sign language through a pre-recorded video; orientation activities using a directional bar to simulate visual impairment.
3	Physical disability	To raise awareness about mobility limitations, accessibility, and autonomy.	Video presentation and discussion on reduced mobility and architectural barriers.	Relay races using crutches and football played with knee restraints to simulate mobility restrictions.
4	Cognitive disability	To promote understanding of learning difficulties and the need for educational support.	Testimonial videos and reflection on cognitive disability.	Pictogram-based communication activities simulating comprehension barriers.
5	Rare diseases	To foster empathy toward individuals with rare diseases and complex health conditions.	Viewing of testimonial videos and discussion of personal experiences.	Wheelchair relay activities to experience physical and social barriers associated with mobility impairments.

samples was used to analyse changes between the two dependent measurements (pre- and post-test).

In a second phase, the possible influence of personal and contextual variables on post-intervention awareness was explored. The Mann–Whitney *U* test was used to compare independent groups in dichotomous categorical variables (sex, family type, type of school, and prior contact with people with disabilities in different contexts). Likewise, the Kruskal–Wallis test was applied to examine differences across school years (Years 4, 5, and 6 of primary education). When the Kruskal–Wallis test yielded statistically significant results, *post hoc* pairwise comparisons were conducted using Wilcoxon tests with Bonferroni correction to control for multiple comparisons.

Each analysis reports the statistical values obtained, the significance levels ($p < .05$), and the corresponding effect sizes (Molina, 2017) so as to assess both the statistical significance and the practical relevance of the results.

3 Results

In order to evaluate the effectiveness of the intervention in raising awareness about people with disabilities, the scores obtained before and after the programme were compared in three dimensions (cognitive, behavioural, and affective) and in the overall awareness score (mean of the 10 items) (see Table 3).

The results indicated a significant improvement in the cognitive dimension following the intervention. Post-test scores were considerably higher than pre-test scores (pre-test mean = 3.61; post-test mean = 3.81; W = 9,539, $p < .001$), with a moderate effect size ($r = .31$), suggesting a meaningful increase in knowledge and understanding about people with disabilities. Regarding the affective dimension, although a slight increase in scores was observed after the intervention (Mpre = 4.26; Mpost = 4.36), the difference did not reach statistical significance (W = 7,256, $p = .132$), and the effect size was small ($r = .13$). Similarly, the behavioural dimension showed no significant differences between pre- and post-intervention scores (Mpre = 4.27; Mpost = 4.21; W = 8,719, $p = .339$), with a negligible effect size ($r = .08$). Finally, a statistically significant increase was found when analysing total awareness (Mpre = 4.00; Mpost = 4.09; W = 12,971, $p = .010$), although the magnitude of change was small ($r = .19$), indicating a modest practical effect.

The second phase of the analysis involved examining levels of awareness after the intervention across various personal and contextual variables to determine possible factors associated with greater or lesser awareness about people with disabilities.

When comparing the sexes, the results demonstrated notable differences in all the dimensions evaluated. In the cognitive dimension, girls obtained a mean of 3.97 (SD = 0.76), significantly higher than that of boys (M = 3.61; SD = 1.07), with a small effect size (U = 8,459, $p = .012$, r = 0.17). Similarly, girls obtained a mean of 4.32 (SD = 0.97) in the behavioural dimension while boys obtained 4.08 (SD = 1.04), also a significant difference (U = 8,800, $p = .034$, $r = 0.14$). Regarding the affective dimension, girls' scores (M = 4.46; SD = 0.73) exceeded those of boys (M = 4.24; SD = 0.88), a difference that was statistically significant (U = 8,794, $p = .034$, r = 0.14). Finally, in the overall awareness index, girls scored a mean of 4.22 (SD = 0.60), which was higher than boys' (M = 3.94; SD = 0.85), with a statistically significant difference (U = 8,515, $p = .016$, $r = 0.17$). In general, as illustrated in Table 4, these findings show that girls had higher levels of awareness than boys in all dimensions assessed following the intervention. Despite the small effect sizes, the consistency of the results points to a clear trend associating females with greater awareness towards people with disabilities.

Possible variations in awareness levels were explored based on the type of school (state or state-subsidised). The results did not show statistically significant differences between state and state-subsidised schools in any of the measured dimensions (see Table 4).

Also examined were differences in post-intervention awareness levels according to whether the pupils were only

TABLE 3 Descriptive statistics for pre- and post-intervention.

Statistic	Behavioural (Pre)	Behavioural (Post)	Cognitive (Pre)	Cognitive (Post)	Affective (Pre)	Affective (Post)	Overall Awareness (Pre)	Overall Awareness (Post)
N	287	287	287	287	287	287	287	287
Mean	4.27	4.21	3.61	3.81	4.26	4.36	4.00	4.09
Pre-post difference	−0.06	0.20	0.10	0.09				
Standard deviation	0.958	0.994	0.986	0.928	0.871	0.805	0.704	0.733
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.50	1.40
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Kolmogorov–Smirnov D	0.247	0.254	0.092	0.101	0.205	0.230	0.105	0.128
Kolmogorov–Smirnov *p* value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Wilcoxon W	8,719	9,539	7,256	12,971				
Wilcoxon *p* value	0.339	< .001	0.132	0.010				
Effect size *r*	0.082	0.306	0.129	0.182				

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TABLE 4 Level of awareness by sex, type of school and type of family.

Variable	Dimension	Girls (M ± SD) *N = 157*	Boys (M ± SD) *N = 130 m*	Mann–Whitney U	*p*	*r*
Sex	Cognitive	3.97 ± 0.76	3.61 ± 1.07	8,459	0.012	0.171
	Behavioural	4.32 ± 0.97	4.08 ± 1.04	8,800	0.034	0.138
	Affective	4.46 ± 0.73	4.24 ± 0.88	8,794	0.034	0.138
	Overall Awareness	4.22 ± 0.60	3.94 ± 0.85	8,515	0.016	0.166
Type of School		**State (M ± SD) *N = 187***	**State-subsidised (M ± SD) *N = 100***			
	Cognitive	3.77 ± 0.95	3.88 ± 0.88	8,821	0.427	0.057
	Behavioural	4.18 ± 0.96	4.26 ± 1.05	8,598	0.236	0.080
	Affective	4.34 ± 0.82	4.38 ± 0.79	9,067	0.658	0.030
	Overall Awareness	4.07 ± 0.73	4.14 ± 0.74	8,711	0.340	0.068
Type of family		**Only child (M ± SD) *N = 26***	**Siblings (M ± SD) *N = 261***			
	Cognitive	4.13 ± 0.84	3.78 ± 0.93	2,550	0.381	0.099
	Behavioural	4.45 ± 0.70	4.18 ± 1.02	3,011	0.046	0.237
	Affective	4.47 ± 0.84	4.35 ± 0.80	2,928	0.276	0.124
	Overall Awareness	4.33 ± 0.65	4.07 ± 0.74	2,622	0.070	0.215

children (0) or had siblings (1). The results showed a significant difference in the cognitive dimension, where only children obtained higher scores (M = 4.13, SD = 0.84) compared to those who had siblings (M = 3.78, SD = 0.93), (U = 2,550, $p = .381$, $r = 0.10$) as well as in the behavioural dimension (Monly child = 4.45, SD = 0.70) (Msiblings = 4.18, SD = 1.02), (U = 3,011, $p = .046$, $r = 0.24$). Conversely, no significant differences were found in the affective dimension (U = 2,928, $p = .276$, $r = 0.12$) or in total awareness (U = 2,622, $p = .070$, $r = 0.22$), although in the latter case the difference was close to statistical significance. As can be seen in Table 4, these results suggest there might be a link between being an only child and a greater level of cognitive awareness about disability after the intervention. However, given the highly uneven size of the groups (26 only children vs. 261 with siblings), these findings warrant cautious interpretation.

In order to examine in greater depth how prior contact influences disability awareness, four types of relationship were analysed separately: contact with a family member, friends, classmates, and in leisure contexts (Table 5). With regard to prior contact within the family environment, the results showed no statistically significant differences in awareness levels between pupils who reported having had family contact with people with disabilities and those who had not. Total awareness scores were slightly higher in the group with family contact (M = 4.13, SD = 0.78) than in the group with no contact (M = 4.08, SD = 0.72), although the difference was not significant (U = 6,634, $p = .391$, $r = .07$). The analysis by dimension showed marginally higher mean values in the cognitive dimension (U = 6,123, $p = .082$, $r = .14$), while the behavioural dimension (U = 6,808, $p = .554$, $r = .05$) and affective dimension (U = 6,852, $p = .610$, $r = .04$) presented no relevant differences.

Regarding prior contact with friends with disabilities, the analyses did not reveal statistically significant differences in any of the dimensions of awareness or in the total score. Pupils who reported having been friends with a person with disabilities scored slightly higher on overall awareness (M = 4.16, SD = 0.60) than those without such contact (M = 4.06, SD = 0.79), albeit with a statistically non-significant difference (U = 9,035, $p = .735$, $r = .02$). Similarly, comparisons by dimension yielded non-significant results: the cognitive dimension (U = 8,517, $p = .262$, $r = .08$), the affective dimension (U = 9,164, $p = .879$, $r = .01$), and the behavioural dimension (U = 9,184, $p = .903$, $r = .01$).

In terms of prior contact with classmates with disabilities, the results showed marginal differences in pupils' awareness, with small effect sizes. In general, the group that had shared a classroom with someone with disabilities obtained slightly higher mean scores in all dimensions and in overall awareness (M = 4.19, SD = 0.67) than those who lacked such an experience (M = 4.02, SD = 0.77). In fact, the difference reached statistical significance only in the behavioural dimension (U = 8,681, $p = .035$, $r = .14$), suggesting that having studied alongside a classmate with a disability could encourage a greater willingness to act inclusively. Conversely, no significant differences were observed in the cognitive (U = 8,868, $p = .084$, $r = .12$) and affective (U = 9,435, $p = .341$, $r = .06$) dimensions, or in overall awareness (U = 8,928, $p = .101$, $r = .11$).

Concerning prior contact with people with disabilities in leisure contexts, the results revealed no statistically significant differences in any of the awareness dimensions or in the overall score. While the group that reported having had this type of contact had slightly higher mean scores in all dimensions (M = 4.12, SD = 0.72 in overall awareness) than those who had not (M = 4.08, SD = 0.74), the differences were not statistically significant. The Mann–Whitney *U* test confirmed the absence of marked differences between groups in the cognitive (U = 8,742, $p = .566$, $r = .04$), behavioural (U = 8,810, $p = .621$, $r = .03$), and affective dimensions (U = 8,887, $p = .712$, $r = .03$) as well as in overall awareness (U = 8,869, $p = .704$, $r = .03$).

TABLE 5 Level of awareness depending on prior contact with people with disabilities.

Variable	Dimension	Contact (M ± SD) *N* = 64	No contact (M ± SD) *N* = 223	Mann–Whitney U	*p*	*r*
Family member	Cognitive	3.96 ± 0.93	3.76 ± 0.93	6,123	0.082	0.14
	Behavioural	4.24 ± 1.01	4.20 ± 0.99	6,808	0.554	0.05
	Affective	4.26 ± 0.94	4.39 ± 0.76	6,852	0.610	0.04
	Overall Awareness	4.13 ± 0.78	4.08 ± 0.72	6,634	0.391	0.07
Friend		**Contact (M ± SD) *N* = 98**	**No contact (M ± SD) *N* = 189**			
	Cognitive	3.94 ± 0.78	3.74 ± 0.99	8,517	0.262	0.08
	Behavioural	4.20 ± 1.02	4.21 ± 0.98	9,184	0.903	0.01
	Affective	4.41 ± 0.65	4.33 ± 0.88	9,164	0.879	0.01
	Overall Awareness	4.16 ± 0.60	4.06 ± 0.79	9,035	0.735	0.02
Classmate		**Contact (M ± SD) *N* = 122**	**No contact (M ± SD) *N* = 165**			
	Cognitive	3.93 ± 0.88	3.72 ± 0.96	8,868	0.084	0.12
	Behavioural	4.29 ± 1.04	4.15 ± 0.96	8,681	0.035	0.14
	Affective	4.43 ± 0.71	4.30 ± 0.87	9,435	0.341	0.06
	Overall Awareness	4.19 ± 0.67	4.02 ± 0.77	8,928	0.101	0.11
Leisure		**Contact (M ± SD) *N* = 95**	**No contact (M ± SD) *N* = 192**			
	Cognitive	3.85 ± 0.94	3.79 ± 0.93	8,742	0.566	0.04
	Behavioural	4.23 ± 1.03	4.20 ± 0.98	8,810	0.621	0.03
	Affective	4.36 ± 0.85	4.35 ± 0.79	8,887	0.712	0.03
	Overall Awareness	4.12 ± 0.72	4.08 ± 0.74	8,869	0.704	0.03

TABLE 6 Level of awareness by school year.

Dimension	Year 4 (M ± SD) *N* = 154	Year 5 (M ± SD) *N* = 69	Year 6 (M ± SD) *N* = 64	Kruskall–Wallis		
				χ^2	p	ϵ^2
Cognitive	3.82 ± 0.90	3.99 ± 0.87	3.58 ± 1.01	6.094	0.047	0.021
Behavioural	4.2 ± 1.05	4.27 ± 0.85	4.17 ± 1.00	0.204	0.903	0.001
Affective	4.36 ± 0.77	4.41 ± 0.86	4.29 ± 0.84	1.122	0.571	0.003
Overall awareness	4.10 ± 0.70	4.20 ± 0.72	3.97 ± 0.81	3.154	0.207	0.011

Awareness levels were compared according to school year, with the results demonstrating that statistically significant differences between years were only observed in the cognitive dimension ($\chi^2 = 6.094$, $p = .047$) (Table 6). Year 5 pupils obtained the highest mean in this particular dimension (M = 3.99, SD = 0.87); however, the very small effect size ($\epsilon^2 = 0.021$) indicates that the practical differences between groups are slight. *Post hoc* pairwise comparisons were conducted using Wilcoxon tests with Bonferroni correction to control for multiple comparisons. These analyses did not reveal statistically significant differences between any specific pair of school years (all adjusted $p > .05$). Although a marginal trend was observed between Year 5 and Year 6 ($p = .052$), this difference did not reach the established significance threshold. In contrast, no significant differences emerged in either the behavioural ($\chi^2 = 0.204$, $p = .903$) or affective dimensions ($\chi^2 = 1.122$, $p = .571$), nor in overall awareness ($\chi^2 = 3.154$, $p = .207$).

4 Discussion

This study sought to assess the impact of an inclusive educational intervention designed to raise disability awareness among primary school pupils, considering both the programme's overall effect and the influence of personal and contextual variables. The results show that the intervention was effective in significantly enhancing awareness in the cognitive dimension and in the overall awareness score. This finding

aligns with earlier studies that highlight that the cognitive dimension of attitudes is more easily modified than affective and behavioural aspects (Trufero, 2021). From the perspective of the three-dimensional model of attitudes, cognitive components are more likely to change in the short term, while emotions and behavioural predispositions require more prolonged and meaningful experiences (Maynard et al., 2017; Yazdani et al., 2016). In light of the results obtained, it may be inferred that while the duration and intensity of the intervention were sufficient to generate conceptual learning, they were insufficient to bring about emotional or behavioural changes, which require higher-quality contact, repetition, and prolonged immersive experiences. Furthermore, high pre-test scores and the possible influence of social desirability reduce the likelihood of detecting significant improvements after an intervention, a common bias where people respond based on what is deemed socially acceptable rather than their true attitudes (Paunonen and LeBel, 2012).

It is also important to consider that baseline scores were already relatively high across the three dimensions, indicating generally favourable initial attitudes towards disability (Castillo and Larson, 2020). This potential ceiling effect may have limited the magnitude of observable change between pre- and post-intervention measurements (Godeau et al., 2010). In this context, even moderate improvements, particularly in the cognitive dimension and overall awareness, become meaningful. Although the affective and behavioural dimensions did not reach statistical significance, the descriptive results (see Table 2) show a slight increase in affective scores and stability in behavioural responses. These patterns suggest that the intervention may have helped consolidate already positive attitudes, even if the duration was insufficient to generate statistically significant changes in the emotional and behavioural components. Including informative, testimonial, and reflective activities seems to have fostered the acquisition of more accurate knowledge and beliefs about disability, which is consistent with recent research that underlines the effectiveness of combining information with practical awareness-raising experiences (Aguado et al., 2008; Aparicio and Polo, 2024; Giuntoli et al., 2024).

When considering personal variables, sex emerged as a differentiating factor in that girls showed higher levels of awareness across all dimensions following the intervention, with small but consistent effect sizes. This pattern mirrors the findings from previous research, which reported greater empathy and a stronger predisposition towards inclusion among female pupils (Pan et al., 2023; Rillotta and Nettelbeck, 2007). Similarly, the fact that only children had higher cognitive scores invites reflection on family dynamics and how socialisation influences the perception of diversity, given that the individualised attention they receive could encourage greater cognitive receptivity towards diversity. However, the small size of the group of only children suggests that these data should be interpreted cautiously.

In terms of contextual variables, no differences were observed between state and state-subsidised schools, which reinforces the idea that the programme's effectiveness does not depend on the type of school, but rather on the characteristics of the intervention itself. Likewise, differences between school years were minimal: only in the cognitive dimension did Year 5 show a slight advantage, albeit with a very small effect size. While prior studies have demonstrated that awareness levels are higher at younger ages and tend to decrease with age (De Boer et al., 2013; Uria-Olaizola et al., 2025), this study suggests that neither age nor school year is a determining factor in short-term awareness about disability.

One particularly relevant aspect was the analysis of prior contact with people with disabilities. Contrary to expectations, given the emphasis in the literature on its positive role (Felipe et al., 2018; Rillotta and Nettelbeck, 2007), the findings did not show any notable differences in overall awareness or its dimensions based on contact with a family member, friends, or in leisure contexts. Only contact with classmates with disabilities was slightly but significantly associated with the behavioural dimension, indicating that daily school life could promote a greater tendency to act inclusively. Furthermore, not all types of contact were found to produce positive effects, with the determining factors being the quality, frequency, and willingness of the interaction (Alhumaid et al., 2023; Alnahdi et al., 2021).

4.1 Practical implications

The findings of this study have several practical implications for schools and educational practitioners. First, the significant improvement observed in the cognitive dimension demonstrates that relatively short, structured, and developmentally appropriate interventions can effectively enhance pupils' knowledge and understanding of disability. Even in contexts where baseline attitudes are already positive, structured awareness programmes can reinforce inclusive perspectives and consolidate favourable beliefs. Second, the absence of statistically significant changes in the affective and behavioural dimensions highlights the need for sustained and systematic implementation. Short-term interventions may initiate reflection, but fostering deeper emotional engagement and behavioural transformation likely requires ongoing opportunities for meaningful interaction, guided reflection, and inclusive practices embedded in everyday school life. Therefore, integrating disability awareness programmes into school guidance and counselling plans or tutorial action programmes may be particularly beneficial. Embedding such initiatives within the curriculum would allow for continuity, repetition, and progressive development across school years. This sustained approach could strengthen not only cognitive understanding but also emotional responsiveness and inclusive behaviours, contributing to the development of a more coherent and long-term culture of inclusion. Finally, implementing structured awareness interventions may benefit not only pupils but also teachers and the wider educational community, supporting schools in moving from a model of access to one of genuine belonging and participation.

4.2 Limitations

Among the limitations of the study are the use of a quasi-experimental design without a control group, which prevents changes from being attributed exclusively to the intervention, and the use of self-reported measures, which are susceptible to

social desirability bias (Andrade, 2021). In addition, there are significant limitations concerning the variable representing prior contact with people with disabilities, namely, that the type of disability, the nature of the relationship, and the frequency of interactions were not specified. This implies that the subjective perception of what pupils consider to be a "disability" may have influenced their responses, and that occasional contact is not equivalent to daily interaction. Furthermore, the sample distribution was not entirely balanced. The number of pupils with siblings was substantially higher than that of only children, which may have influenced comparisons related to family structure. Likewise, there were notable differences in the number of participants across grade levels, with Year 4 students representing more than half of the total sample. This imbalance may have affected the sensitivity of analyses examining differences between school years and should be considered when interpreting the results. Finally, although the programme's length was appropriate for the educational context, the short duration of the intervention may have been insufficient to foster lasting changes in the affective and behavioural dimensions, which typically require longer, more immersive processes.

Consequently, aligning with previous studies, future research should include control group designs, analyse the quality and frequency of contact with people with disabilities, and implement longitudinal follow-ups to assess the stability and generalisation of changes (Álvarez-Delgado et al., 2021; Qandeel et al., 2025; Reina et al., 2022). It would also be advisable to work with larger, more balanced samples, which would allow a more accurate analysis of the possible role family dynamics play in the development of inclusive attitudes towards disability. In addition, it is recommended that this type of intervention be integrated into school guidance and counselling programmes, ensuring its continuity and systematic development throughout the academic year. This incorporation would not only serve to consolidate learning, but it would also reinforce affective and behavioural components, helping to develop a more coherent and sustainable inclusive culture in schools over time.

5 Conclusion

This study confirms that a 10-h inclusive educational intervention can improve awareness about disability among primary school pupils, especially in the cognitive dimension and in the overall awareness score. The findings show that knowledge and understanding are the aspects most likely to change in the short term, whereas the affective and behavioural dimensions require longer, more immersive experiences for their consolidation. Girls also presented higher levels of awareness. However, other personal and contextual variables, such as school year, type of school, or prior contact with people with disabilities, had a limited influence on the results. These findings reinforce the importance of incorporating structured, experiential, and reflective programmes into the school curriculum, combining information, meaningful contact, and active participation. Integrating these interventions into school guidance and counselling programmes would ensure their continuity, strengthen the emotional and behavioural dimensions of attitudes, and consolidate a more coherent and lasting culture of inclusion. Their sustained implementation would benefit not only pupils, but also teachers and the educational community as a whole.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Deusto ETK-68/23-24. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

NU-O: Formal analysis, Conceptualization, Writing – original draft, Data curation, Methodology, Project administration, Investigation. GY: Conceptualization, Writing – review & editing, Investigation, Supervision, Software, Visualization. PL-G: Data curation, Validation, Supervision, Resources, Investigation, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author PL-G declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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was used in the creation of this manuscript. We used ChatGPT to generate assistance in editing, which we reviewed, edited, and take full responsibility for. All final wording reflects my own edits and judgment.

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