

Systematic Review

Teachers' Attitudes toward Autism Spectrum Disorder: A Systematic Review

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Abstract: (1) Teachers' attitudes toward the inclusion of students with autism spectrum disorder (ASD) in mainstream schools influence daily educational practices. Depending on whether these attitudes are favorable or not, inclusive education could be fully or partially reached. This systematic review aims to analyze teachers' attitudes toward ASD and to determine the variables that moderate them. (2) We conducted a systematic review in WoS, Scopus, and PsycINFO databases, obtaining an amount of 16 studies included in this review. (3) The results revealed inconclusive levels in teachers' attitudes: Some of the teachers reported positive attitudes, some neutral, and some negative. (4) Among the variables that probably moderate attitudes, we found knowledge, experience, training, and gender. Future research and implications for pre-service and in-service teachers, school administrators, and policy makers are suggested.

Keywords: ASD; attitudes; autism; systematic review; teachers



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1. Introduction

1.1. Autism Spectrum Disorder: Prevalence and Inclusion in Mainstream Schools

Autism spectrum disorder (ASD) is a heterogeneous neurodevelopmental disorder characterized by persistent deficits in social communication, social interaction, and restricted and repetitive patterns of behavior, interests or activities [1].

In the last years, its prevalence is reported to be increasing worldwide and is currently estimated to affect 1/100 individuals [2]. Nevertheless, this rate varies depending on the study and the country where the studies are carried out: For example, the prevalence in Spain is around 1/100 [3], while in the United States, it is estimated as 1/59 [4]. Other studies suggest that the prevalence is even higher: 1/36 individuals [5]. These differences among the prevalence rates are not only attributable to the increase in the incidence of the disorder, but also to changes in the diagnostic criteria, to special education policies, and to knowledge and awareness levels regarding the disorder [6,7].

Apart from the differences in rates and the possible causes of this increase, what is fairly clear is that the prevalence of ASD has remarkably increased in recent years [6,8]. This increase in ASD prevalence coincides with an inclusive educational scenario, in which the number of children and young students with ASD that are educated in mainstream pre-schools, primary schools, high schools, and universities, is also increasing [9,10].

Given the high prevalence rates, there is a high probability that teachers find students with ASD along their careers. There are many benefits in inclusive education, such as accessibility to general education curricula and opportunities for interaction with other students. However, this situation may also cause multiple challenges for teachers, due to the needs of the children with this disorder, their special characteristics, the disruptive and unusual behavior, and the lack of time and resources to educate them in mainstream schools, among other factors [11]. Therefore, depending on the way teachers respond to these stressful situations, their attitudes toward the challenges could be considered a

barrier or a positive outcome to reach high standards of inclusive practices [12]. As a result, teachers need to be equipped with the appropriate attitudes in order to face these barriers.

1.2. Teachers' Attitudes toward the Inclusion of Children with ASD

Attitudes can be described as beliefs, feelings, and behavioral tendencies toward socially significant objects [13]. Some authors [14] define them as tendencies to favor or disfavor while assessing a particular situation, such as including students with ASD in mainstream schools. In this case, the authors of [15] referred to attitudes as people's cognitive and emotional evaluations and behavioral intentions toward an object, idea or information, which could be individuals, organizations, values, etc.

Teachers are mainly responsible for putting educational policies into practice, and their attitudes are a crucial point in this regard. In recent decades, policies tend towards increasingly inclusive models, seeking to achieve the highest levels of presence, participation, and learning of all students in the regular educational system. In this sense, in the case of children with ASD, teachers' attitudes toward including them play a critical role in the success of inclusive education.

Teachers' attitudes toward the inclusion of children with ASD can have a significant impact on their interactions in the classroom, not only on children with ASD interactions, but on educational community interactions (families, peers, other teachers, etc.). Therefore, they are a cornerstone in order to materialize inclusive policies into real inclusive practices.

Positive attitudes toward the disorder are important, since the pedagogical activity carried out by teachers can facilitate inclusive practices. On the contrary, negative attitudes toward the inclusion of students with ASD, accompanied by low expectations of what they can learn, can constitute a barrier to the inclusion of students with ASD [12] and lead to failures in students' personal, social, and educational development [16].

It must be considered that attitudes are not created from scratch. They are molded and shaped from the experiences and training received. In this sense, the study of teachers' attitudes toward the inclusion of students with ASD is a very important aspect since it is possible to work towards their improvement.

1.3. Variables That Influence Teachers' Attitudes toward the Inclusion of Children with ASD

Past research regarding teachers' attitudes toward inclusion has been contradictory and inconclusive since teachers have reported both positive attitudes toward the inclusion as well as strong negative feelings regarding having students with various disabilities in mainstream classrooms [17]. For instance, several studies argue that teachers are receptive to teaching students with ASD [18,19]. However, other studies evidence negative attitudes toward their inclusion [20]. In addition, research has found that a specific type of functional diversity could influence the attitudes of educational professionals toward inclusion [21,22].

Therefore, it is desirable not only to assess attitudes toward ASD, but also to take into account other variables that, according to prior studies, influence them, such as: Knowledge [20,23,24], training [20,24–26], experience [23], self-efficacy [27,28], culture [7,29,30], and gender [25,27].

1.3.1. Teachers' Knowledge and Attitudes toward ASD

Specific knowledge regarding autism was found to positively influence attitudes toward ASD [31,32]. Teachers' knowledge regarding the disorder can act as an awareness broadcaster of social change toward an inclusive education [33]. Therefore, the more knowledge teachers have regarding functional diversity, the more positive their attitude toward the inclusion of these students [34].

1.3.2. Teachers' Training and Attitudes toward ASD

Some studies that assess the attitudes of special and regular teachers concluded that special education teachers show significantly more favorable attitudes toward inclusion than regular teachers [25,35]. These differences may be related, at least in part, to the initial

training that teachers receive depending on their specialization. While special education teachers are trained in content related to inclusive education, regular teachers usually receive extensive pedagogical training, in which the content of inclusion represents only a small part.

The same situation has been experimented in countries where the initial training of primary education teachers is substantially different from the initial training of secondary education teachers. For example, in the Spanish educational system, the initial training for primary education teachers has a greater weight in terms of inclusion than the initial training for secondary education teachers [36].

This difference in the initial training of teachers in both stages probably influences the fact that primary school teachers present a decidedly more positive attitude toward inclusion than secondary school teachers [16,37,38]. Therefore, the contents related to inclusion, which are included in initial training plans, seem to be closely related to the attitudes toward inclusive education. In this review, the qualification and stage in which participants teach are considered as “training”.

1.3.3. Teachers’ Experience and Attitudes toward ASD

Experience also constitutes an important variable in the creation of positive or negative attitudes [39]. The authors of [31,32] concluded that spending time around someone with autism influenced attitudes toward the disorder in a positive way. Specifically, the authors of [40] contended that teachers who had been actively involved in teaching pupils with functional diversity held significantly more positive attitudes toward inclusion than their colleagues with little or no relative experience. The authors of [41] pointed out that almost all of the faculty members in their study revealed that the interactions and relationships with people with disabilities prior to teaching students with ASD and other disabilities have helped them in developing positive attitudes toward these students’ inclusion. In this review, contact and interaction are also considered as “experience”.

1.3.4. Teachers’ Self-Efficacy and Attitudes toward ASD

The author of [42] defined self-efficacy as the belief of an individual in his/her own capabilities. Moreover, attitudes toward inclusion are positively influenced by their sense of self-efficacy [43]. Furthermore, higher levels of self-efficacy are associated with more positive attitudes toward inclusion [27,35], and they can be an essential element for a successful inclusive approach [44]. In this case, to create an inclusive learning environment, it is important for the teachers to believe in themselves in order to have the ability to use inclusive strategies, since teachers with high levels of self-efficacy are open to new ideas and methods [21].

1.3.5. Culture and Teachers’ Attitudes toward ASD

The relationship between teachers’ attitudes and culture depends on two types of culture: The culture of the country where the teachers live, and the culture of the school where the teachers work. Both of them influence the attitudes toward functional diversity. Regarding the differences between cultures worldwide, there are a wide range of implications for mental health practices, ranging from the attitudes and ways that people view health and illness, to treatment seeking patterns, the nature of the therapeutic relationship, and education, etc. [45]. For instance, the authors of [46] found differences between the attitudes of Australian and Italian teachers. This situation could be explained by legislation and sociocultural practices. In the case of school culture, each educational institution has a clear vision statement which guides their daily practices in the scholar setting [17] and determines the values, rules, behavioral styles of the educational members, attitudes, assumptions, and beliefs that create the identity of the organization’s members. Therefore, every single person is essential to the development of the school culture in practice [47]. In fact, other studies stated that teachers are more willing to include students in their classrooms when the culture of the school encourages teaming and collaboration [47,48].

1.3.6. Teachers' Gender and Attitudes toward ASD

The authors of [17,27] reported that personal characteristics, such as gender can have a significant impact on teachers' attitudes. However, gender is a controversial variable, as there are several studies with different conclusions. Some studies found that female teachers showed more positive attitudes toward inclusion than males [49,50], while other studies carried out in high schools found that male teachers felt more positive toward the inclusion than female teachers [51]. There are also studies that did not find any differences in attitudes between the two genders [17,52].

1.4. Methods and Instruments Used to Assess Teachers' Attitudes toward ASD

Assessing teachers' (and indeed any citizen's) attitudes toward people with ASD is a controversial issue, in which the perception of what is considered politically correct plays an important role. Therefore, the choice of the method used to evaluate these attitudes is a key issue.

The problem of assessing attitudes is not recent. The middle of the last century warned that "there is a very real need for instruments which do not destroy the natural form of the attitude in the process of describing it" [53]. This risk is especially evident when we directly ask the teachers about their attitudes toward their own students. The risk of receiving an answer is resolved by focusing on what their attitudes are expected to be, not what they really are.

The authors of [54] showed that teachers' attitudes were different depending on which entity was asking the questions. This is a clear example, in which participants' responses are significantly influenced by what they assume their interlocutors want to hear.

To minimize these difficulties, it would be advisable to use indirect techniques, in which attitudes are assessed in a way that is poorly identifiable by teachers. In fact, there are some promising tools that assess attitudes' implicitly [55].

However, to date, these alternative tools have been little used. In addition, the most common method in assessing teachers' attitudes is still the Likert-type questionnaire [56–58], a type of quantitative and self-report instrument in which social desirability bias can have a relatively easy influence on the outcomes. Therefore, the conclusions obtained by studies that evaluate attitudes explicitly, should always be interpreted with caution, due to the potential influence of biases of different types.

1.5. Interventions to Improve Teachers' Attitudes toward the Inclusion of Children with ASD

Given the disparity in attitudes toward ASD, global interventions are needed in relation to societal attitudes, values, and beliefs, especially in the educational community responsible for inclusion. The authors of [59–61] reviewed 23 studies which aimed to improve pre-service teachers' attitudes toward inclusion throughout pre-service teacher-training interventions. They studied four types of interventions: Information-based cognitive interventions, practical experience, combination of information and practical field experience, and comparison of an information-based cognitive intervention with an intervention combining information with practical field experience. Both the information-based cognitive interventions and combination of information and practical field experience interventions were reported as leading to more positive attitudes toward inclusion. Some studies have carried out contact and experience interventions [62,63], interventions with group discussions [64], role-play interventions [64], the use of videos to improve attitudes [65], case studies [66], legislation seminars [63,67], and meditation interventions [68].

1.6. Previous Systematic Reviews regarding Teachers' Attitudes toward the Inclusion of Students with ASD

The authors of [18] carried out a review of educational stakeholders' perspectives on inclusion regarding students with ASD in mainstream schools. They analyzed 23 studies from 2004 to July 2015 in order to better understand the facilitators and barriers to success at school for students with autism. They concluded that the attitudes reflected in the

analyzed articles were mixed. Educators who had previous experience enrolling students with functional diversity showed more favorable attitudes toward inclusion.

The authors of [69] conducted a review regarding teachers' perceptions and attitudes on the inclusive education of students with ASD. They analyzed 55 articles and dissertations from 1999 to 2017 and concluded that most of the teachers have negative attitudes toward the inclusive education of students with ASD, as well as limited or inadequate knowledge and basic misconceptions regarding the disorder. Additionally, this review revealed that some teachers hold neutral attitudes on the inclusion of these pupils, and only few participants held positive attitudes toward ASD. The authors suggested that teachers should receive more training on the disorders and educational interventions in order to develop positive attitudes toward the inclusion of students with ASD.

The authors of [70] conducted a systematic review regarding the regular education teachers' attitudes toward the inclusion of children with ASD in mainstream schools. They included 29 studies from 2003 onwards. Results confirmed that regular education teachers held mixed attitudes (positive and negative) toward inclusion due to the unusual behavior of children with ASD. It was also reported that teachers had little knowledge regarding the disorder, due to the lack of in-service teachers training, workshops, and seminars. As a result, they may face some challenges that are difficult to manage in mainstream classes with children with ASD, and suggested increasing the training of regular teachers.

1.7. Purpose of the Study

Following the consideration of previous systematic reviews regarding teachers' attitudes toward the inclusion of students with ASD, our study could add some new points to the field. First, we take into account empirical scientific articles over the last lustrum (5-year-period). In addition, our review focuses on attitudes, considering the variables that probably influence them, and involving teachers from any area, stage or specialization. Considering that the inclusion of students with ASD in mainstream schools demands the assessment of teachers' attitudes toward ASD, due to their crucial role in inclusive education [20], our purpose is two-fold, as follows:

- To conduct a systematic review of studies based on teachers' attitudes toward the inclusion of students with ASD.
- To analyze the variables that possibly influence teachers' attitudes regarding the inclusion of children with ASD in the mainstream school environment.

2. Materials and Methods

2.1. Search Procedures

A systematic search of empirical articles, focused on the assessment of teachers' attitudes toward the inclusion of students with ASD, was conducted. It was carried out considering the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines (Page et al., 2021).

A comprehensive search was conducted using the following databases: PsycINFO, Web of Science (WoS), and Scopus. The search was conducted on 8 August 2021. In the case of WoS, the following keywords were combined in the fields of title or author keywords or abstract: ("autis*" OR "ASD"), AND "teacher" AND "attitud*"; in the case of Scopus, we used the same terms in the fields of title-abstract-keywords; and in the case of PsycINFO, we used them anywhere, except for the full text. The search period ranged from 2015 to 2020. Additionally, a search was carried out in Google Scholar. We conducted an exploratory search of the first 20 sites, not including the duplicate records, and used the advanced search mode. Moreover, we used the same terms, in the field of title. Similarly, the reference lists of the selected articles were also reviewed to identify the other relevant studies.

2.2. Selection Procedures: Eligibility and Exclusion Criteria

The inclusion criteria were as follows:

- Only empirical studies that assess pre- and/or in-service teachers' attitudes toward the inclusion of students with ASD (including autism and Asperger's diagnoses).
- Only educational professionals, specifically teachers (from any stage and specialization).
- From 2015 to 2020, in English.

The exclusion criteria were as follows:

- Articles involving other diagnoses apart from ASD.
- Participants are neither pre- nor in-service teachers.
- Other types of publications that are not scientific articles published in peer review journals (therefore, other types of publications were excluded).
- Purely descriptive or theoretical articles that did not provide empirical data on the subject of the review.

It is important to point out that this systematic review refers to attitudes and not opinions, nor views, awareness, perspectives, concerns, feelings or intentions.

The search results generated a total of 331 articles: Three in WoS, 138 in Scopus, 162 in PsycINFO, 10 from Google Scholar, and 18 articles from reference lists. Following the removal of 64 duplicated studies from WoS, Scopus, and PsycINFO, two of the authors independently read the titles and abstracts of the remaining 267 studies. Then, a total of 219 articles were excluded. Therefore, 48 articles were read in their entirety by these authors. Thereafter, 32 studies were discarded since they did not meet the inclusion criteria. Finally, the review generated 16 studies. The search and selection process are summarized in Figure 1.

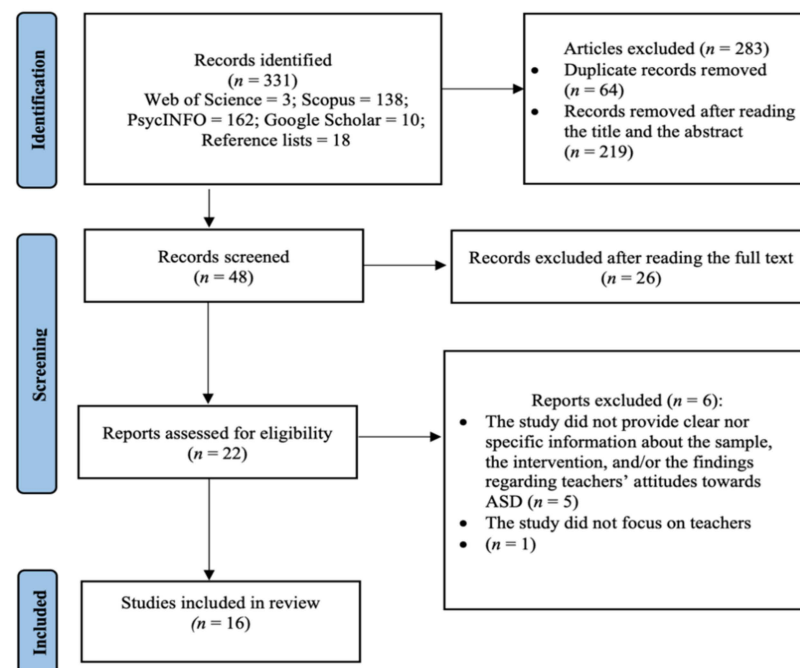


Figure 1. Flow diagram used in this systematic review (according to PRISMA).

2.3. Data Collection Process and Data Items

All of the 16 studies were independently reviewed by two of the authors. Information was extracted in each study and synthesized. The studies were coded using the following characteristics: The country, a brief description of the sample, the instrument used to assess attitudes, and a brief summary of the results. Following the independent reviews, cases with few divergences in data collection were discussed and resolved by consensus.

To carry out a deeper analysis of the results shown in the reviewed studies, four tables were included to gather crucial information. We designed an indicative classification of the studies attending at the percentage (or score) obtained by the instrument used in each article. Three ranges (according to the results obtained) were established: Less than 33%, among 33 and 66%, and more than 66%. We presented the studies that compared the attitudes among teachers from different countries and the studies that carried out an intervention in order to improve attitudes. The instruments that the included studies used to assess attitudes were also synthesized.

3. Results

3.1. Teachers' Attitudes toward the Inclusion of Children with ASD

Sixteen studies that met the selection criteria were identified, as shown in Table 1. Their goal was to assess the attitudes of education professionals regarding the inclusion of students with ASD. Each purpose will be more specified with a description of the instruments and samples involved. Moreover, some studies analyzed the influence of other variables on teaching attitudes. Therefore, for each study, we will specify the sample used, the instrument with which the attitudes have been evaluated, and the results and conclusions.

3.2. General Information Regarding the Reviewed Studies

Table 2 presents the studies that assess attitudes without comparing teachers from different countries or in two different moments. The studies are organized according to the results in teachers' attitudes, depending on whether they are negative, neutral or positive. As mentioned in the Methods Section, the analyzed studies are organized according to three established score ranges: Less than 33%, among 33 and 66%, and more than 66%.

According to the relationship between culture and attitudes, we found two articles. Table 3 presents the articles that compare countries, in order to observe which cultures show and promote better attitudes toward the inclusion of pupils with ASD.

Table 4 shows the studies that recommend interventions in order to help teachers in changing their negative attitudes toward the inclusion of students with ASD. In this review, only three of the analyzed studies carry out an intervention in this sense.

3.3. Teachers' Attitudes of ASD and Methods and Instruments Used for Assessment

The only type of instrument used in the analyzed studies was quantitative data. The studies have been organized according to the instrument used. More than half of the included studies ($n = 13$) utilized a previously published questionnaire, while nine preferred to create their own questionnaire in order to better approach the instrument in their sample, as shown in Table 5, in the "Others" Section.

Table 1. Included studies in this systematic review.

| Study | Sample | Instrument | Results and Conclusions |
|--|---|---|---|
| [71] (2015) USA | <i>n</i> = 234 in-service teachers (ECT and PST); REG = 68%; SET = 32%; A: 37; G: 76% females and 24% males; n.m.i. | Survey to assess teacher's attitudes regarding children with ASD [72]. It consists of seven statements and uses a Likert-type scale; $\alpha = 0.77$. | Teachers' attitudes were more negative toward the students with ASD than toward the other students ($t = 15.70, p < 0.001$). REG showed more negative attitudes toward the students with ASD than SET (2.59 vs. 2.14; $t = 6.43, p < 0.001$). Gender (female: $t = -2.63, p < 0.01$), holding a special education certification ($t = -4.83, p < 0.001$), and teaching at an elementary grade level ($t = 2.16, p = 0.03$) were significant predictors to get inclusive practices. |
| [73] (2015) Greece | <i>n</i> = 228 in-service teachers (118 PST, 67 ST and 93 special, inclusive of multicultural and special vocational teachers); G: 166 females and 62 males; A: 36.4% are in the age range of 31–40 years and 35.5% in the age range of 41–50 years; EXP: 28.1%; CON: 22.8% at least one student with ASD; TR: 36.4%. | Questionnaire ad hoc. It measures teachers' views and attitudes regarding ASD and consists of 21 questions. | Most of the teachers considered specific ASD characteristics as barriers, while intellectual disability is not valued as a negative aspect. Only 83 out of 228 teachers held that inclusive education can help children with ASD. Past training, education, and experience on ASD contribute to possessing positive attitudes toward ASD. Furthermore, teachers (69.7%) believe that ASD students can participate in secondary education or, alternatively, in technical and vocational education. |
| [74] (2016) Saudi Arabia and United States | <i>n</i> = 185 in-service teachers; USA: <i>n</i> = 42 (ECT: 16.3%; PST: 41.9%; MST: 11.6%; HT: 23.3%; others: 7%); REG: 55.8%; SET: 11.6%; other: 32.6%; A: 43% are in the age range of 36–45 years; G: 73.8% females and 26.2% males; EXP: 100%; CONT (dis): 97.7%. Saudi Arabia: <i>n</i> = 137 (ECT: 9.2%; PST: 43.7%; MST: 17.6%; HT: 16.2%; others: 13.4%); REG: 46.4%; SET: 29.3%; <i>p</i> : 4.3%; PSY: 5%; others: 15%; A: 65% are in the age range of 20–25 years; G: 62.6% females and 37.45% males; EXP: 94.3%; CONT (dis): 63.6% | Autism Attitude Scale for Teachers (AAST) [75]. It measures the attitudes of teachers toward children with ASD. In addition, it consists of 14 questions and uses a 5-point Likert-type scale where 1 indicates "strongly disagree" and 5 indicates "strongly agree"; $\alpha = 0.789$. Moreover, it was translated into Arabic. | A statistically significant difference was found between the USA and Saudi Arabia on the full survey scale. Teachers from the USA had more positive attitudes toward inclusion than the Saudi Arabian participants. In fact, Arabian teachers present negative attitudes toward the inclusion in mainstream classrooms of children with ASD. This difference is probably due to a lack of awareness, training, and cultural attitudes toward stigmatization in Saudi Arabia. Therefore, Arabian teachers have reservations regarding the inclusion of children with SEN in their regular classrooms, which may be rooted in sociocultural variables. Regarding specialization, REG and SET did not have differences toward children with ASD. |
| [76] (2016) United States | <i>n</i> = 82 in-service teachers (secondary teachers from grades 9 to 12); REG: 61%; SET: 39%; EXP: all of them with experience in teaching children with ASD; n.m.i. | Adaptation of Scale of Teachers' Attitudes toward Inclusive Classrooms (STATIC, [77]). It measures the attitudes of secondary REG and SET toward children with ASD. In addition, it consists of 20 statements and uses a Likert-type scale. | There were no significant differences among the REG and SET results (54.39 vs. 56.47). In total $t (79) = -0.88, p = 0.38$. They all had positive attitudes toward the inclusion of children with ASD in mainstream settings, probably since training, experience, and knowledge provide them with the necessary skills to work effectively with ASD. |

Table 1. Cont.

| Study | Sample | Instrument | Results and Conclusions |
|-----------------------------|---|---|---|
| [78] (2016) China | $n = 471$ in-service teachers; ECT: 99% are female and 1% are males; A: 58.4% are in the age range of 20–34 years; n.m.i. | Self-administered questionnaire. It measures the attitudes toward the care and education of children with ASD. In addition, it consists of 10 items and uses a 5-point Likert-type scale where 1 indicates “strongly disagree” and 5 indicates “strongly agree”. It was an adaptation from the survey by the authors of [79]. | Eighty-three percent provided inaccurate responses to more than half of the questionnaire items that assess the knowledge of ASD. Attitudes regarding ASD were on average fairly neutral or slightly favored improving education for children with ASD. Moreover, 72–73% of the teachers felt strongly about the need for government funding for teachers’ training in SEN. |
| [80] (2018) Malaysia | $n = 264$ pre-service teachers; G: 86.4% female and 13.6% male; A: 24 year-olds and below Study 1 $n = 151$ (pre-service SET): 68 at Year 1, 48 at Year 2, 35 at Year 3. Study 2 $n = 181$ (year 1 pre-service teachers in different specializations): 83 at sciences, 30 English education, and 68 at SET. | AAST [76]; $\alpha = 0.71$. The attitudinal survey was conducted in two parts: Study 1 and Study 2. | The pre-service SET presented less positive attitudes toward the inclusion of children with ASD than the pre-service REG at other specializations. Societal attitudes and the Malaysian teacher training model influence pre-service teachers’ attitudes toward inclusive education for children with ASD. Study 1: There were significant differences in attitudes toward inclusion between Year 1 to 3; SET: $F(2) = 5.036, p < 0.01$. Training stimulates positive changes in pre-service teachers’ attitudes toward inclusion. Study 2: There were no significant differences in the attitudes toward educational inclusion: $F(2) = 1.501, p = 0.226$. Although SET pre-service teachers reported a more positive attitude toward the inclusion of children with ASD. |
| [81] (2019) Australia | $n = 107$ in-service teachers REG: 89%; SET: 10%; p : 1%; A: 31% are in the age range of 20–30 years; 30% are 31–40 years; 26% 41–50 years; 13% +50 years; G: 98% females and 2% males; EXP: 95% with more than a year of experience; n.m.i. | Adaptation of AAST [75]; $\alpha = 0.90$. | Attitudes toward the inclusion of students with ASD were highly positive. The Australian PST obtained similar scores to their American Northwest counterparts (28.96 vs. 28.39, the first time and 28.55 vs. 32.81, the second time). There is a low correlation between the levels of training and years of specific experience and teachers’ attitudes toward the inclusion of students with ASD. |
| [82] (2019) China | $n = 211$ pre-service PE teachers from two PE teacher education programs of 5 years to complete their training. From Year 1: 42, Year 2: 42, Year 3: 50, Year 4: 39, and Year 5: 38. A: 18–26 years old (M: 20.83, SD: 1.84; G: 45% females and 55% males. | A three-item scale was used to evaluate the attitudes toward including students with ASD [83]. It measures physical educators’ attitudes toward including students with ASD. In addition, it was translated into Chinese; $\alpha = 0.87$. | The attitude scores were 4.45 out of 7 (0.95). Mindfulness and basic psychological needs satisfaction positively predicted and have a moderate effect on physical educators’ attitudes toward ASD. The negative teaching experiences might be attributed to the lack of quality training in SEN PE. When PE teachers’ basic psychological needs are satisfied, they will feel more confident. |

Table 1. Cont.

| Study | Sample | Instrument | Results and Conclusions |
|-----------------------------|--|--|--|
| [84] (2019) Indonesia | <i>n</i> = 245 in-service teachers; PST in inclusive schools; n.m.i. | Survey. Descriptive statistics are used to analyze data by describing the collected data. | Participants showed positive attitudes toward students with ASD. Teachers are good at understanding the characteristics of students with ASD and they have a good emotional response to the existence of students with ASD in the classroom. Teachers already have an excellent response to the academic aspects, social aspects, and emotional aspects of the students with ASD in their class. |
| [85] (2019) Turquía | <i>n</i> = 193 pre-service teachers; ECT attending third and fourth grade participated in the study; G: 174 females and 19 males (there is no more information regarding the involved sample); n.m.i. | Attitude Toward the Inclusion of Autistic Children [86]. It assesses the experience, knowledge, attitudes, and current practices of educational professionals related to the inclusion of students with ASD. In addition, it consists of 19 items, and uses a 7-point Likert-type scale from “I agree absolutely” to “not absolutely”; $\alpha = 0.86$. | Participants were wrong in six out of 15 items. Pre-service teachers’ attitudes toward children with ASD were examined in relation to certain demographic variables (grade, previous EXP with children with ASD, and taking a course about special education). Teachers’ attitudes toward children with ASD did not differ significantly based on these variables. The only significant relationship was found between the ECT attitudes and prior training on ASD. |
| [87] (2020) USA | <i>n</i> = 508 pre-service teachers in 1st (21.7%), 2nd (35.2%), 3rd (30.7%), and 4th degree year (12.2%); G: 80.9% females and 19.1% males; EXP with SEN: 20%; CONT (internship, 88% and volunteer experience in special education school settings, 20%). | Adaptation of AAST [75]. | For pre-service teachers, the coursework on ASD seemed to be negative for attitudes. However, the pre-service teacher internship and volunteer experiences have an impact on their attitudes toward the inclusion of ASD in a positive way. Pre-service teachers who had taken coursework on ASD showed a negative notion of full inclusion and were in favor of partial and self-contained classroom settings for students with ASD. |
| [88] (2020) Ireland | <i>n</i> = 78 in-service teachers (PST); G: 62 females and 12 males (4 n.d.); A: >18 years old; EXP: Teaching a child with ASD in a mainstream classroom; TR: Most of them have a module in SEN and degrees in training or initial teacher training. Some teachers completed a postgraduate training in SEN or had participated in short-term courses. | Impact of Inclusion Questionnaire (IIQ, [89]). It measures the impact of inclusion on the child with ASD in the school or classroom environment. In addition, it consists of 24 items and uses a 7-point Likert-type scale, where 1 indicates ‘very strongly agree’ and 7 indicates ‘very strongly disagree’; $\alpha = 0.92$. | Half of the participants had negative attitudes toward the inclusion of children with ASD in mainstream education. Thirty-six percent held neutral attitudes and only 10% viewed inclusion positively. The gender and number of years of teaching experience did not influence teachers’ attitudes toward inclusion of children with ASD. Training in SEN and/or inclusion did not influence teachers’ attitudes toward the inclusion of children with ASD. Teachers who believed they had the adequate resources to make inclusion possible had significantly more positive attitudes than teachers who did not believe that. |

Table 1. Cont.

| Study | Sample | Instrument | Results and Conclusions |
|--|--|--|---|
| [90] (2020) Sweden, Finland, and England | <i>n</i> = 704 pre-service teachers (262 Swedish, 251 Finnish, and 191 English); PST and SET. G: 579 females and 120 males (five did not state their gender). A: 19–55 years old; n.m.i. | Ad hoc survey. It measures the cognitive, affective, and behavioral components of attitudes and uses a 9-point Likert-type scale. In addition, it rates how participants felt toward people with ASD on a series of bipolar adjective pairs “positive–negative”, “friendly–hostile”, “trusting–suspicious”, “contempt–respectful” (adapted from [91]); $\alpha = 0.86$. | Positive contact predicted positive attitudes. English teachers showed more positive attitudes than the other two groups. In England, pre-service teachers were encouraged to have contact with pupils with special educational needs including ASD, and to perform volunteer work. This was uncommon in Sweden and Finland. The authors of this study considered that Swedish and Finnish teacher training programs should adopt the English model to promote contact opportunities. |
| [92] (2020) Malaysia | <i>n</i> = 87 in-service teachers SET; G: 69.0% females and 31% males; A: 25–34 years old (58.6%); EXP in mainstream classrooms: 86.1%; EXP in special education classroom: 24.1%; training in ASD: 47.1% | AAST [75]; $\alpha = 0.91$. The survey was translated into Malay, apart from the English version. | Malaysian SET had less positive attitudes toward the inclusion of children with ASD compared to the American and Swedish teachers, since societal attitudes have a strong predictive power on their attitudes toward inclusive education for students with ASD (3.48 vs. 4.06 and 3.72, respectively). Knowledge is related to self-competence to embrace children with ASD. Female teachers were found to have a more positive attitude toward ASD than male teachers. |
| [93] (2020) China | <i>n</i> = 386 in-service teachers; G: 78.6% females and 21.4% males; A: 37.5% of the participants are less than 30 years and 27.1% of the participants are between 40 and 49 years old; CONT with ASD: 42.2%; n.m.i. | AAST [75]; $\alpha = 0.70$. | Participants had a moderately positive attitude toward children with ASD (mean of 3.20). Attitudes are related to knowledge and professional self-efficacy: Participants with a poor attitude tend to give up when they have little knowledge, and low levels of self-efficacy. |
| [94] (2020) China | <i>n</i> = 65 pre-service teachers (ECT); G: 84.6% females and 15.4% males. A: mean age of 21.18 (SD = 1.80) experimental group (<i>n</i> = 33) and control group (<i>n</i> = 32). TR: 0.85; SD: 1.42 (experimental groups) and TR: 0.88; SD: 1.29 (control group) CONT and EXP: <i>n</i> = 30 | A three-item scale was used to evaluate the attitudes toward including students with ASD [83]; $\alpha = 0.75$ (baseline) and $\alpha = 0.91$ (post-test). The survey was translated into Chinese. | Mindfulness meditation did not improve the pre-service teachers' attitudes, but only their basic psychological needs satisfaction. |

Note. ECT: Early childhood teachers; PST: Primary school teachers; MST: Middle school teachers; HT: High school teachers; REG: Regular teachers; SET: Special education teachers; SEN: Special education needs; G: Gender; A: Age, age ranges or mean age; TR: Training in ASD; EXP: Experience with children with ASD; CONT: Previous contact with students with ASD; n.d.: Not defined; n.m.i.: No more information was provided.

Table 2. General information regarding descriptive transversal studies.

| Study | Country | Sample | Stage | Specialization | Occupation | Other Variables | Instrument |
|-------------------------------------|---|--------|---|---|----------------------|--|------------------------------|
| Negative (<i>n</i> = 1) | | | | | | | |
| [88] | Ireland | 78 | PST | REG and SET | In-service | Gender, experience, and training | Questionnaire |
| Neutral (<i>n</i> = 6) | | | | | | | |
| [73] | Greece | 228 | PST, ST, and other professionals * | REG and SET | In-service | Training and Experience | Questionnaire |
| [78] | China | 471 | ECT | - | In-service | Knowledge and training | Questionnaire |
| [82] | China | 211 | PE PST | REG | Pre-service | BSN and dispositional mindfulness | Survey |
| [85] | Turkey | 193 | ECT | - | Pre-service | Experience and training | Questionnaire |
| [92] | Malaysia | 87 | Mainstream and special education classroom | SET | In-service | Knowledge and gender | Questionnaire |
| [93] | China | 386 | - | - | In-service | Knowledge and self-efficacy | Questionnaire |
| [73,78,82,85,92,93] <i>n</i> = 6 | Greece, China (3), Turkey, and Malaysia | 1576 | ECT, PST, ST, PE PST, and other professionals * | REG and SET | Pre- and In- service | Knowledge, training, experience, self-efficacy, gender, BSN, and dispositional mindfulness | Questionnaire (5) and Survey |
| Positive (<i>n</i> = 4) | | | | | | | |
| [71] | USA | 234 | ECT, PST | REG and SET | In-service | Stage and gender | Questionnaire |
| [76] | USA | 82 | ST | REG and SET | In-service | Training | Questionnaire |
| [81] | Australia | 107 | - | REG and SET | In-service | Training and experience | Questionnaire |
| [84] | Indonesia | 245 | PST | Inclusive school | In-service | - | Questionnaire |
| [71,76,81,84] <i>n</i> = 4 | USA (2), Australia, Indonesia | 668 | ECT, PST, ST | REG, SET, and teachers from an inclusive school | In-service | Training, experience, stage, and gender | Questionnaire |

Note. ECT: Early childhood teachers; PST: Primary school teachers; MST: Middle school teachers; ST: Secondary teachers; REG: Regular teachers; SET: Special education teachers; PE PST: Physical education primary school teachers; BSN: Basic psychological needs satisfaction; Other professionals *: Teachers who work in special schools, integration classes, technical secondary education in special vocational training, and multicultural schools.

Table 3. General information regarding transcultural comparative studies.

| Study | Countries | Occupation | Attitudes | Variables | Instrument |
|-------|--------------------------------|------------------------------|------------------------------|----------------------|---------------|
| [74] | Saudi Arabia and United States | In-service ECT, PST, MST, HT | USA > Saudi Arabia | Training and culture | Questionnaire |
| [90] | Sweden, Finland and England | Pre-service PST and SET | England > Sweden and Finland | Contact and culture | Survey |

Note. ECT: Early childhood teachers; PST: Primary school teachers; MST: Middle school teachers; HT: High school teachers; SET: Special education teachers; USA: United States of America.

Table 4. General information of studies carrying out an intervention.

| Study | Intervention | Occupation | Variables | Results |
|-------|------------------------|----------------------|-------------------------------------|--|
| [80] | Training at University | Pre-service | Training | Special education pre-service teachers were less in favor of the total inclusion of students with ASD in the mainstream, when compared with the non-special education pre-service teachers. |
| [87] | Coursework on ASD | Pre-service teachers | Experience | Pre-service teachers who had taken one or more credit courses on autism did not agree with full inclusion (direct effect), but if they perceived the necessity for special education, their resistance to full inclusion diminished (indirect effect). |
| [94] | Mindfulness | Pre-service | Needs satisfaction Age Gender | The mindfulness meditation did not improve pre-service teachers' attitudes toward inclusive education, only their basic psychological needs satisfaction. Therefore, mindfulness had an indirect effect on attitudes through needs satisfaction. |

Table 5. Instruments employed in the analyzed studies to assess teachers' attitudes toward ASD.

| Instruments | Study |
|----------------------------------|---------------------|
| ATIAC | [85] |
| AAST | [74,80,81,87,92,93] |
| STATIC | [76] |
| Beamer and Yun [83] | [82,94] |
| Harnum, Duffy, and Ferguson [72] | [71] |
| Others | [73,78,84,90] |

Note. ATIAC: Attitude Toward the Inclusion of Autistic Children; AAST: Autism Attitude Scale for Teachers; STATIC: Adaptation of Scale of Teachers' Attitudes Toward Inclusive Classrooms; IIQ: Impact of Inclusion Questionnaire. The term "others" refers to the ad hoc and self-administered questionnaires.

4. Discussion

The purpose of this study was to conduct a systematic review based on teachers' attitudes toward the inclusion of students with ASD in mainstream settings and to identify and analyze the variables that possibly influence them.

The results regarding teachers' attitudes toward inclusion have been contradictory and inconclusive, as shown by the literature reviews on inclusion, which are not specifically focused on ASD [17,70]. Teachers who participated in the studies included in this review have reported both positive and negative attitudes regarding the inclusion of students with several disabilities in mainstream classrooms. Herein, we included an amount of 16 studies, and only four confirmed that teachers hold positive attitudes toward ASD and their inclusion in mainstream schools. This coincides with the studies carried out by Roberts and Simpsons [18] and Rodden et al. [19]. Six other studies showed that teachers have neutral attitudes, as shown in the review conducted by Kofidou et al. [69]. Finally, only one study considered that teachers hold negative attitudes toward this disorder, as the previous articles indicated [20]. The remaining articles that compare countries ($n = 2$) showed that some differences exist between the cultures when analyzing attitudes toward ASD [45] and those that used an intervention to change the negative attitudes into positive ones. In this case, [80,87,94] ($n = 3$) showed that training increases the awareness of the inclusion challenge.

4.1. Variables That Influence Teachers' Attitudes toward the Inclusion of Children with ASD

According to the variables that probably influence attitudes, the most repeated by the reviewed studies were knowledge, training, experience, culture, self-efficacy, and gender, as some articles had previously indicated [7,20,23–25,27,29,30,35].

4.1.1. Teachers' Attitudes toward ASD and Knowledge

In the current review, in some cases, high levels of knowledge correspond to positive attitudes [76,92,93]. This could be due to the fact that a higher level of knowledge influences the overcoming of prejudices and the breaking of stigmas. Knowing the characteristics of students with ASD could help teachers in understanding that disruptive and/or maladaptive behavior are an inherent difficulty in controlling adaptive behavior or in sensory regulation [33]. However, in some cases, they found that a high level of knowledge is not related to positive attitudes toward the inclusion of children with ASD. For instance, Liu et al. [78] reported low levels of knowledge, but neutral or slightly positive attitudes toward ASD. In addition, they did not specify if the involved sample had experience with ASD or students with any type of functional diversity, which is a very important variable to consider [31,32].

4.1.2. Teachers' Attitudes toward ASD and Training

The variable training, which is significantly related to knowledge, is also mentioned and/or considered in several of the included studies [73,74,76,78,80–82,85,88,90,92]. In fact, some of the studies [78,90], as well as the previous literature [69,70], advocate the promotion of training programs in future lines of research. This helps in educating teachers or pre-service teachers regarding the disorder, as well as providing them with the strategies, tools, and knowledge to increase their self-confidence and the capability to educate students with ASD. In three of the studies, in which teachers show positive attitudes toward ASD, the ECT and PST were involved [71,81,84], while only in one of them, the ST appeared [76]. This could be due to differences in the degree training courses. Early and primary teachers' training include more specific training in inclusive education than secondary pre-service training. This finding corroborates with the previous literature [16,25,35,38].

4.1.3. Teachers' Attitudes toward ASD and Experience

With respect to experience, several of the studies included in this review argue that experience and contact with people with ASD (or any other type of functional diversity) potentially improve teachers' attitudes toward the inclusion of students with this disorder [73,76,87]. Experience and contact with people with autism, in a more powerful way than training and courses, help people in overcoming prejudices. In line with some previous studies, this review points out that the teachers realize that day-to-day and direct contact with children with ASD are not as complex as it may seem [31,32,40]. Nevertheless, two studies included in the review reported that there is no correlation between a previous experience with children with ASD and positive attitudes [81,88]. Additionally, one study reported that negative experiences can cause a lack of confidence in working with these students. This could be due to the fact that negative experiences can be an unfavorable variable that affects teachers' attitudes toward inclusion, although experience is important in developing positive attitudes toward ASD.

4.1.4. Teachers' Attitudes toward ASD and Self-Efficacy

Only one study managed the feeling of self-efficacy of teachers when working with students with ASD [93]. The participants were the in-service and not pre-service teachers. In this case, the results indicated that teachers had a neutral professional self-efficacy and also a neutral attitude toward ASD. Therefore, according to this study, there was a significantly positive correlation between teachers' attitudes toward ASD and their professional self-efficacy. This could be due to the fact that more than 40% of the participants had a previous contact with children with ASD. As a result, their perceptions could influence their teaching effectiveness. In addition, experience and positive attitudes toward children with ASD in mainstream schools help teachers in better planning, organizing, and conducting activities that fulfill inclusive education.

4.1.5. Teachers' Attitudes toward ASD and Culture

The culture, in which the teachers are immersed, also influences them in developing positive attitudes toward the inclusion of students with ASD [7,29,30,74]. Four studies that evidenced positive outcomes were carried out with teachers from the USA (two of them), Australia, and Indonesia. In contrast, among the studies that reached a neutral or negative attitude toward the disorder, were the samples from China (three), Malaysia (two), Greece, Ireland, and Turkey. In general, we found more occidental countries among the group of positive attitudes and less occidental countries between those with negative attitudes. The differences could be related to changes in the history of providing services and inclusive education [74]. In the specific case of the three articles that compare the attitudes of teachers from different countries, the results are inconclusive. However, it is clear that a diversity-friendly culture, with inclusive policies, that promote and disseminate awareness programs on ASD, may lead to an improvement in teachers' attitudes.

4.1.6. Teachers' Attitudes toward ASD and Gender

In the majority of the studies, gender has been considered to assess teachers' attitudes toward ASD [71,82,88,92,94]. Two of these articles concluded that females hold more positive attitudes toward ASD than males [71,92]. This finding is consistent with the prior literature [49,50] and could be related to certain social differences between gender [95]. In the case of some studies [82,94], although they consider the variable gender relevant when assessing attitudes, they did not find any clear relationship between attitudes and gender. Finally, only one study out of five found no differences between the two genders [88]. One possible explanation could be that the recent and growing incorporation of males to the education field have improved their attitudes through training and experience and minimized these social differences [16,38]. Further research is needed in this field.

4.2. Limitations

This study has several limitations. First, the great disparity of instruments used by the analyzed studies has made it difficult to categorize the results into "positive", "neutral" or "negative" attitudes toward the disorder. This is due to the fact that each instrument used a different scoring system, and while the average scores have been calculated to correctly categorize them, it is essential to point out that the scales used by each questionnaire may differ. In addition, the construction of the questionnaires could be affected by other non-considered variables, such as cultural aspects or difficulties in the adaptation of some questionnaires to specific contexts, etc. The second limitation is that only scientific articles published in Research Journals were included in this systematic review. For this reason, some documents which are focused on the same issue that it is analyzed in this review have been excluded. Another limitation, which is related to the second, is the selection bias. Finally, there is no consensus regarding which variables should be taken into account during the assessment of attitudes. Although some of the included studies considered knowledge, experience, training, and gender, most of the articles did not consider stage, age, self-efficacy, need satisfaction, nor culture.

4.3. Future Lines of Research

Future research could go beyond the mere study of attitudes and carry out an analysis of the sources from which they are formed, as well as possible interventions to improve them. For example, they should consider to which extent mass media (such as series, films, books, online platforms, and social networks) affect teachers' attitudes (and, in the end, society's attitudes). The previous literature revealed that mass media influence teachers' conceptions toward ASD since they show a specific image of the diagnosis [96]. Indeed, television series and films have an effect on people's information and influence their attitudes depending on how functional diversity, such as ASD, is portrayed [97]. Consequently, it is important to consider their influence in a world where content is

available with only one click of a button. Moreover, only four studies carried out an intervention in order to improve attitudes toward ASD.

It should be advisable to include teacher training programs in some researches to assess whether they can improve attitudes or not. Moreover, it should be desirable to use other instruments apart from questionnaires to gather more comprehensive information on what these attitudes are, what variables influence them, and how to intervene to make them positive. For example, interviews, focus groups or expert groups could be used to gather qualitative information. Another suggestion could be for studies to involve teachers from high stages, and not only from early stages. Specifically, there is a growing presence of students with ASD in mainstream high schools, vocational education, and even in university degrees. Therefore, it could be interesting and practical to extend these participants to vocational teachers, directors, faculty lecturers, as possible teachers of students with ASD or as current faculty trainers of trainers.

4.4. Practical Implications

Several implications for teachers, teachers' training, school administrations, and education policies can be drawn from the findings obtained in this study. Herein, we discuss (a) the need for teachers to be aware of inclusive education for students with ASD; (b) the role of training colleges in improving attitudes toward ASD; (c) the role of school administrators in building a more inclusive school culture; and (d) the necessity of public inclusive policies. Teachers need to examine whether their perception toward their students with ASD is different than toward neurotypical students, and whether these attitudinal differences induce their discriminative interaction and unfair expectations toward students with ASD. They must leave behind their prejudice and educate themselves about ASD. In the event that a teacher has no training on ASD, but has a student in his/her classroom with this disorder, it would be interesting to coordinate with previous and specialized teachers.

In the case of university degrees, trainers must be the first to ensure that teacher degrees have training and internships with students with functional diversity. Initial training is a key variable in the formation of teacher identities. Therefore, we must strive to design a curriculum that aspires to train confident teachers. In addition, it is also interesting that school administrators promote an inclusive school culture. This is achieved by opening schools to accommodate children with special educational needs, if they have the option to choose; programming training for school teachers, regardless of their role or functions; conducting parent schools; and organizing awareness-raising talks for peer groups. In summary, promoting an inclusive culture where everyone can be present in participating, contributing, and interacting with any member of the educational community.

Finally, in the case of education policies, it is necessary for different countries or education systems to pursue the global goals of equity, equality of opportunities, and rights, seeking the inclusion of pupils in mainstream classrooms. To this end, these policies must be accompanied by material and economic resources, infrastructure, and trained and sensitized personnel. Those in charge of designing educational policies should be aware of effectively modifying daily practices. The enactment of educational laws is not enough. In fact, it is necessary to provide teachers with sufficient resources to apply these policies. Otherwise, the laws could be ineffective, since we want teachers to undertake a really complicated task without the necessary tools to perform. If this happens, teachers with positive attitudes would not be found. Instead, they would feel overloaded due to the demands. In addition, this would carry terrible repercussions, from an inclusive point of view.

5. Conclusions

The present systematic review draws some relevant conclusions from the findings obtained in this study:

First, teachers' attitudes toward ASD are not as positive as they should be. Only five studies clearly show positive teachers' attitudes. In the case of studies where teachers'

attitudes from different countries are compared, we found that none of the occidental countries have the same level of attitudes, despite the United Nations International Convention on the Rights of Persons with Disabilities. This indicates that additional policies and training should be achieved and training programs at universities should be reviewed. In addition to cultures, differences also exist between the specializations and stages of the educational system.

Second, if we truly aspire to be able to study the phenomenon of attitudes in all its complexity, it should be advisable to consider all of the possible variables when studying attitudes. Variables, such as experience with children with ASD, training in inclusive environments, knowledge about the disorder, self-efficacy toward ASD, culture and inclusive policies in the country, and sources from which they get information regarding the disorder, should be taken into account.

Third, in addition to considering other variables, as it has been evidenced in this review, the only instrument used in assessing attitudes toward ASD is the Likert-type questionnaire. Therefore, if we continue to study attitudes only through the Likert-questionnaire, this complex concept will be viewed only from one point of view. As a result, this situation provides us with only quantitative data, which is probably bound to a social desirability bias. This prevents us from delving into the problem, which is increasingly entrenched.

Finally, there are still many inequalities in the method of addressing diversity in mainstream schools. Additionally, there is still a lack of positive awareness of functional diversity to translate into positive attitudes toward inclusion and the right to education of students with ASD. This is a long path that can be solved, among other measures, with training and direct contact with students with ASD (for example, in internships or volunteer experiences) to help pre-service teachers in understanding that all of the students should be educated in the same environment in order to be included in the micro-social system represented by educational institutions.

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