



EFFECTIVENESS OF SOCIAL STORIES IN INTERVENTION IN AUTISTIC SPECTRUM DISORDER: A REVIEW

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Las historias sociales, como técnica de intervención psicoeducativa, constituyen un elemento recurrente en la práctica de los profesionales responsables de la intervención con personas con trastorno del espectro autista (TEA). Este trabajo presenta una revisión de la literatura científica de la última década en torno a la efectividad de la aplicación de las historias sociales en la intervención en habilidades comunicativas y sociales en personas con TEA. Se seleccionaron 29 trabajos empíricos bajo criterios específicos, analizados en función de seis categorías: edad de los participantes, objetivo de la intervención, contexto de aplicación, persona que aplica la intervención, validez social y comparación con otras estrategias de intervención. Aunque los resultados sobre su efectividad no son concluyentes, las historias sociales son valoradas como una herramienta significativa para implementar o desarrollar conductas en niños y preadolescentes con TEA en sus principales contextos de socialización y por parte de personas allegadas.

Palabras clave: Trastorno del espectro autista, Historias sociales, Intervención psicoeducativa, Revisión de la literatura.

Social stories, as a technique of psychoeducational intervention, constitute a recurring element in the practice of professionals responsible for intervention with people with autism spectrum disorder (ASD). This work presents a review of the scientific literature of the last decade about the effectiveness of the application of social stories in the intervention in communication and social skills in people with ASD. Twenty-nine empirical studies were selected according to specific criteria, analyzed according to six categories: age of the participants, objective of the intervention, context of application, person applying the intervention, social validity, and comparison with other intervention strategies. Although the results about the effectiveness of this intervention are not conclusive, social stories are valued as a significant tool to implement or develop behaviors in children and preadolescents with ASD in their main socialization contexts and with people close to them.

Key words: Autistic spectrum disorder, Social stories, Psychoeducational intervention, Literature review.

Autism spectrum disorder (ASD) is included in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) of the American Psychiatric Association (APA, 2014) in neurodevelopmental disorders, characterized by the presence of: a) persistent deficits in communication and social interaction across multiple contexts; and b) a repertoire of restrictive and repetitive behaviors, interests, or activities. The severity of the diagnostic criteria marks the severity of the disorder, which is classified into three levels, from 1 to 3, depending on whether there is a need for support, substantial support, or very substantial support.

The communicative deficit means autonomy is limited, due to the habitual difficulty in communicating using language fluently, even in people with a high level of intellectual ability. The emotional area is also usually affected, both socially and in terms of self-knowledge, so people with level 1 ASD usually have difficulties in identifying and describing their emotions as

well as a limited ability to adopt alternative mental perspectives to reinterpret the meaning of a specific situation (Samson, Gross, & Huber, 2012). The low level of social-emotional understanding affects their social interactions with peers and adults, which can reduce the quality and durability of their social relationships and communication opportunities, having a long-term impact on their mental health (McKown, Allen, Russo-Ponsaran, & Johnson, 2013).

Limitations have also been found in episodic memory as well as difficulties in evoking details of personal experiences due to the meaning given to the information to be remembered (Hutchins & Prelock, 2018). This, together with a deficit in the executive functions (Corbett, Constantine, Hendren, Rocke, & Ozonoff, 2009), influences the reconstruction of the facts and, therefore, the interpretation of the personal and social experiences, affecting the development of the self-concept, identity, mentalist skills, self-regulation, flexible problem solving, and adaptive social behavior (Hutchins & Prelock, 2018).

Thus, ASD is a developmental disorder that has effects throughout the life cycle in areas such as social relationships, behavior, and autonomy - key dimensions of personal fulfillment that are covered and worked on from the perspective of social

Received: 3 December 2018 - Aceptado: 6 May 2019

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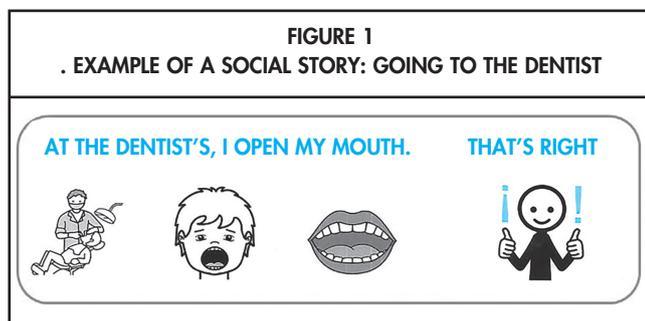
stories. The present study analyzes the effectiveness of this type of tool, social stories, in the intervention in these areas of the person's development.

SOCIAL STORIES

Introduced by Carol Gray in the 90s (Gray, 1995; Gray & Garand, 1993), social stories are highly structured scripts, consisting of individualized phrases or stories that specify how a person should act in certain contexts or situations, and they may include the consequences - in terms of reinforcements - that will be obtained by the behavior. The objective is for the person to understand how and why he or she should act or behave in a certain situation so that the behavioral change is maintained in the long term. Therefore, it is necessary to ensure that the person understands the terms of the social story, so the type of support (photographs, pictograms, words, etc.) must be comprehensible and adapted for each particular case.

This tool can be aimed at many different intervention objectives such as improving the interpretation of social situations, the behavior in public places, teaching social skills, inferring the perspective and/or response of others in certain contexts, activities and situations in the school environment, teaching habits of hygiene and personal care, the development of desirable behaviors, and the elimination or reduction of disruptive behaviors (Balakrishnan & Alias, 2017; Gray, 2015).

As examples, we include two brief social stories aimed at behavioral regulation; the first case is for the situation of going to the dentist (Figure 1) and the second case is for toilet training (Figure 2). Both have been created with pictograms by the *Portal Aragonés de Sistemas Aumentativos y Alternativos de Comunicación* [Aragonese Portal of Augmentative and Alternative Communication Systems] (ARASAAC).



The aim of the present work was to conduct a review of the scientific literature of the studies published in the last decade regarding the effectiveness of the application of social stories in the intervention in communication and social skills in people with ASD.

METHOD

The search was carried out using the Web of Science database, with terminology in English, between the years 2008 - 2018. The search procedure was performed by combining the following keywords in the title and in the summary: (ASD) or (autism) or (autistic) or (autistic spectrum disorder) and (social stories). The total results, once the target terms were introduced, amounted to 319 articles published in English in different countries.

We proceeded to a first screening, by which we discarded all those works that were not directly related to the theme (autistic spectrum disorder and the use of social stories in the intervention), which reduced the number of works to 83. For the final selection, a series of exclusion and inclusion criteria were used. The exclusion criteria were: (a) theoretical reviews and meta-analyses, (b) populations with disorders not related to autism, (c) access to full text not available, and (d) not specifying results related to the effect of social stories on behavior. The inclusion criteria were: (a) empirical studies, (b) focused on the effectiveness of social stories, and (c) population of people with ASD. Finally, the number of studies selected for the review was 29.

To provide a better understanding for the reader, the search procedure as well as the inclusion and exclusion criteria are reflected in the flow chart represented in Figure 3.

RESULTS

The effectiveness of social stories was the object of study of the 29 articles analyzed in this work. Table 1 summarizes the main characteristics and results of the 29 articles included in this review. Ordered chronologically, the table includes: year of publication, sample size, age and sex of the participants, diagnosis according to the DSM-5 classification, context of application, objective of the intervention (whether it aims to implement or reduce behavior) and results (including generalization and/or maintenance data, if available).

The following is an analysis of the results observed, classified into six categories according to the variable considered to evaluate the effects derived from the intervention with social stories in the population with ASD.

Age of the participants

Different age groups have been included in the works on the study objective of this review, although those that focus on school-age children predominate. Although the interventions that have obtained variable or inconclusive results are basically those whose participants are adolescents or adults (O'Handley et al., 2015; Samuels & Stanfield, 2011; Schwartzberg &

Silverman, 2013), we also find inconclusive results in some studies with school-age children (Beh-Pajoohet et al., 2011; Chan et al., 2011; Daneshvar, Charlop, & Malmberg, 2018; Hanley-Hochdorfer et al., 2010; Hutchins & Prelock, 2013; Kagohara et al., 2013; Leaf et al., 2012; Leaf et al., 2016; Vandermeer et al., 2015).

The studies that obtained entirely positive results had children and preadolescents as participants (Acar et al., 2017; Almutlaq & Martella, 2018; Chan & O'Reilly, 2008; Cihak et al., 2012; Golzari et al., 2015; Graetz et al., 2009; Hung & Smith, 2013; Mancil et al., 2009; Mandasari et al., 2011; Ozdemir, 2008a; Ozdemir, 2008b; Reichow & Sabornie, 2009; Sansosti & Powell-Smith, 2008; Thompson & Johnston, 2013) and, in one of the cases, adolescents (Olçay-Gül & Tefik-Iftar, 2016). Therefore, most of the positive results were obtained in children's age groups.

Objective of the intervention

Social stories are aimed, essentially, at the implementation of appropriate behavior in the repertoire of the person with ASD and/or the elimination of disruptive or socially inappropriate behavior. Analyzing this facet of the studies, those that had positive results usually included objectives of both types, although there are more studies aimed at implementing or improving a previously established behavior (Acar et al., 2017; Almutlaq & Martella, 2018; Chan & O'Reilly, 2008; Cihak et al., 2012; Golzari et al., 2015; Mandasari et al., 2011; Ozdemir, 2008b; Reichow & Sabornie, 2009; Sansosti & Powell-Smith, 2008; Thompson & Johnston, 2013) versus those seeking to reduce it (Graetz et al., 2009; Hung & Smith, 2011; Mancil et al., 2009; Ozdemir, 2008a).

However, among the studies that present ambiguous or inconclusive results, compared to other intervention strategies, there are also more studies aimed at implementing or improving a behavior (Chan et al., 2011; Daneshvar et al., 2018; Haney-Hochdorfer et al., 2010; Hutchins & Prelock, 2013; Kagohara et al., 2013; Klett & Turan, 2012; Leaf et al., 2012; Leaf et al., 2016; O'Handley et al., 2015; Schwartzberg & Silverman, 2013; Vandermeer et al., 2015) than ones aimed at eliminating behavior (Beh-Pajoohet et al., 2011), thus the implications of the results obtained based on the objective of the intervention remain unclear.

Context of application

Social stories can be applied in different contexts, the main ones being the learning place of the person with ASD or their own home. The majority of the analyzed studies were developed in the school environment of the participants. Most of these interventions showed favorable results (Chan & O'Reilly, 2008; Graetz et al., 2009; Mancil et al., 2009; Mandasari et al., 2011; Ozdemir, 2008a; Ozdemir, 2008b; Reichow & Sabornie, 2009; Sansosti & Powell-Smith, 2008), while the rest obtained confusing or unnoteworthy results (Almutlaq &

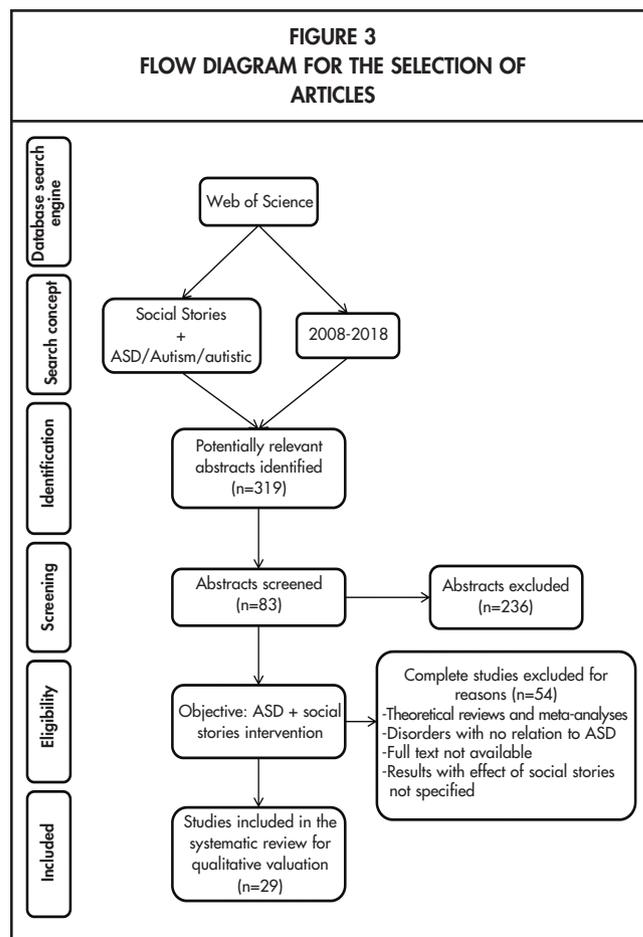
Martella, 2018; Beh-Pajoohet et al., 2011; Chan et al., 2011; Kagohara et al., 2013; O'Handley et al., 2015; Vandermeer et al., 2015).

The investigations carried out in the family environment are less numerous in this review, amounting to a total of four works. Two of them had positive results (Acar et al., 2017; Olçay-Gül & Tekin-Iftar, 2016) and the other two had results of low significance or variable ones (Klett & Turan, 2012; Leaf et al., 2012). Finally, regarding the application of social stories in other types of contexts, such as the workplaces of researchers (Daneshvar et al., 2018; Hutchins & Prelock, 2013) or environments intended for recreational activities (Schwartzberg & Silverman, 2013), the results were confusing and did not support the use of social stories.

The people who apply the intervention

Another aspect in which the various works differ is that of the person who designs and applies the intervention with social stories. The social stories that are part of the interventions were mostly designed and developed by researchers, but were then generally followed by the main interlocutor of the person with ASD in their particular context: teachers, support professionals

FIGURE 3
FLOW DIAGRAM FOR THE SELECTION OF
ARTICLES



**TABLE 1
ITEMS INCLUDED IN THE REVIEW**

Author(s) and year of publication	N	Age (years)	Sex	Diagnosis	Context of application	Objective of the intervention	Results
Chan & O'Reilly (2008)	2	5–6	M	ASD level 2	School	To implement and reduce behaviors	Positive changes in behavior maintained over time. Performance similar to that of the pairs after the intervention.
Ozdemir (2008a)	3	7–9	M	ASD levels 2-3	School	To reduce behaviors	Significant reduction of disruptive behaviors. Maintenance of results.
Sansoti & Powell-Smith (2008)	3	6–10	M	ASD level 1	School	To implement behaviors	Positive effects (reaching a level close to their peers) in all participants, in combination with video modeling. Short-term maintenance effects were shown.
Ozdemir (2008b)	3	5–6	M	ASD level 2	School	To implement behaviors	Effective interventions. Effects maintained and generalized to other contexts by some of the participants.
Graetz, Mastropieri, & Scuggs (2009)	3	12–13	M and F	ASD levels 2-3	School	To reduce behaviors	Immediate and pronounced positive results for all participants.
Mancil, Haydon, & Whitby (2009)	3	6–8	M and F	ASD level 2	School	To reduce behaviors	Results slightly higher when social stories are presented through computers. Generalization of classroom results to recess with verbal help. Maintenance of the use of the computer option and the frequency of disruptive behavior at levels lower than those of the baseline.
Reichow & Sabornie (2009)	1	11	M	ASD level 1-2	School	To implement behaviors	Positive results. Maintenance by means of visual aids. Return to baseline after withdrawal of intervention.
Hayley-Hochdorfer, Bray, Kehle, & Elinoff (2010)	4	6–12	M and F	ASD level 1	School	To implement behaviors	Variable and limited results with social stories as the only intervention. The data suggest that it is an intervention with limited effectiveness.
Hung & Smith (2011)	1	6	M	ASD levels 2-3	School	To reduce behaviors	Positive results. Not generalizable due to sample size.
Chan et al. (2011)	3	8	M	ASD levels 2-3	School	To implement behaviors	Low to medium improvements. Higher and stable values than in the baseline.
Samuels & Stanfield (2011)	4	17–32	M	ASD levels 2-3 and symptoms of ASD in Prader-Willi syndrome	Clinic	To implement and reduce behaviors	Positive impact. Variable results, more remarkable when addressing the reduction of problematic behaviors.
Beh-Pajooh, Ahmadi, Shokoohi-Yekta, & Asgary (2011)	3	8–9	M	ASD	School	To reduce behaviors	Positive effects of the application only in some of the participants. Results not generalizable.
Mandasari, Valerie Lu, & Theng (2011)	3	10–11	M	ASD levels 1-2	School	To implement behaviors	Positive increase in objective behavior. Knowledge transferred naturally to daily activities.
Leaf, Oppenheim-Leaf, Cal, Sheldon, & Sherman (2012)	6	5–13	M	ASD levels 1-2	Family and clinic	To implement behaviors	Lower results compared to the teaching interaction procedure.
Klett & Turan (2012)	3	9–12	F	ASD level 2	Family	To implement behaviors	Variability of results and the time necessary for the appearance of improvements. Development of new knowledge and skills.
Hanley-Hochdorfer, Bray, Kehle, & Elinoff (2012)	4	6–12	M and F	ASD level 1	School	To implement behaviors	Limited effect as the only intervention.
Cihak, Kildare, Smith, McMahon, & Quinn-Brown (2012)	4	11–14	M	ASD levels 1-2	School	To implement behaviors	Improvements of all the participants in maintaining commitment with the task carried out.



in the classroom, language therapists (e.g., Chan & O'Reilly, 2008; Chan et al., 2011), or family members in the context of the home (e.g., Klett & Turan, 2012; Olçay-Gül & Tefik-İftar, 2016).

Approximately two-thirds of the research applied by school environment professionals or therapists had positive results (Chan & O'Reilly, 2008; Graetz et al., 2009; Mancil et al., 2009; Ozdemir, 2008b; Sansosti & Powell-Smith, 2008), while the remaining third had variable results (Chan et al., 2011, Kagohara et al., 2013). Intervention through social stories applied by family members resulted in generally positive results (Acar et al., 2017; Klett & Turan, 2012; Olçay-Gül & Tefik-İftar, 2016).

In the rest of the works, the application of the intervention was carried out by the researchers themselves (e.g., Hutchins &

Prelock, 2013; Ozdemir, 2008b) or the social stories were used by the participants themselves (e. g., Hanley -Hochdorfer et al., 2010; Reichow & Sabornie, 2009). The results in approximately half of these cases were positive (Almutlaq & Martella, 2018; Cihak et al., 2012; Mandasari et al., 2011; Ozdemir, 2008b; Thompson & Johnston, 2013), while the rest were inconclusive but in favor of the use of social stories (Beh-Pajoooh et al., 2011; Daneshvar et al., 2018; Hutchins & Prelock, 2013; Leaf, et al., 2012; Leaf et al., 2016; Schwartzberg & Silverman, 2013; Vandermeer et al., 2015).

Another fact to consider is the usual interlocutors learning to design social stories prior to their implementation. Research that focuses on the creation and use of social stories by family members obtained positive results in the participants' behavior (Acar et al., 2017; Olçay-Gül & Tekin-İftar, 2016).

TABLE 1
ITEMS INCLUDED IN THE REVIEW (Continuation)

Author(s) and year of publication	N	Age (years)	Sex	Diagnosis	Context of application	Objective of the intervention	Results
Schwartzberg & Siverman (2013)	30	9–21	M	ASD	School	To implement behaviors	Confusing results Impossibility of generalizing data on effectiveness.
Kagohara et al. (2013)	2	10	M and F	ASD level 1 with ADHD	School	To implement behaviors	Positive results with different degrees of success. The skills were not generalized to other interlocutors.
Hutchins & Prelock (2013)	20	4–12	M and F	Generalized development disorder and ASD level 1	Clinic	To implement behaviors	Variability of results. Higher level of success with concrete and tangible objectives. Maintaining positive results.
Thompson & Johnston (2013)	3	3–5	M	Characteristics of ASD	School	To implement behaviors	Improvements maintained after the suspension of the intervention. Increase in independence in the classroom.
Vandermeer, Beamish, Miford, & Lang (2015)	3	4	M and F	ASD levels 2-3	School	To increase behaviors	Highly variable effects.
Golzari, Alamdarloo, & Moradi (2015)	30	6–12	M	ASD	Clinic	To increase behaviors	Positive effects not significant.
O'Handley, Radley, & Whipple (2015)	6	16–19	M	ASD level 2 with ID	School	To increase behaviors	Relatively lower efficiency compared to video modeling, both in training situations and in generalized contexts.
Leaf et al. (2016)	1	7	M	ASD level 1	Clinic	To increase behaviors	Significantly lower results compared with the cool not cool method.
Olçay-Gül & Tekin-İftar (2016)	3	12–16	M	ASD	Family	To increase and reduce behaviors	Positive results. Maintenance and generalization of skills.
Acar, Tekin-İftar, & Yikmis (2017)	3	6–10	M	ASD levels 1-2	Family	To implement behaviors	Significant improvements in all participants. Generalization of skills to different scenarios.
Daneshvar, Charlop, & Malmberg (2018)	4	5-10	M and F	ASD	Clinic	To implement behaviors	Ineffectiveness of social stories compared with the intervention based on the presentation of photographs of behavioral repertoires. Limited effect as the only intervention.
Almutlaq & Martella (2018)	3	8-10	M	ASD	School	To implement behaviors	Efficiency of social stories through the app Lack of generalization to other scenarios.

Note: M = male; F = female; ASD = autistic spectrum disorder; ID = intellectual disability



Social validity

Social validity refers to the subjective evaluation carried out by the participants in a study, or their carers, regarding the treatment received.

In works in which the social validity of the treatment with social stories was included, the evaluation was carried out through semi-structured interviews, social validity scales aimed at teachers such as the Intervention Rating Profile (Martens, Witt, Elliott, & Darveaux, 1985), or other ad hoc scales aimed at family members. From this type of data collection, the following conclusions are derived regarding the use of social stories: 1) They are easy to use/implement, both for parents and for education professionals (Acar et al., 2017; Almutlaq & Martella, 2018; Mancil et al., 2009; Thompson & Johnston, 2013). 2) They are useful (Klett & Turan, 2012). 3) They are a recommended intervention for other parents or professionals (Klett & Turan, 2012). 4) They provide personal and emotional satisfaction to family members (Acar et al., 2017; Klett & Turan, 2012). 5) They do not consume excessive instruction hours for the teaching staff or the students (Mancil et al., 2009). 6) They are easily adapted to the routines of the users and the class (Almutlaq & Martella, 2018; Mancil et al., 2009; Ozdemir, 2008b). 7) They can be used independently by the users (Mancil et al., 2009). 8) The users enjoy using and sharing social stories (Ozdemir, 2008b).

Comparison with other intervention strategies

Among the literature reviewed, we found that the effectiveness of social stories as an intervention method in ASD has been compared with different alternative methods.

Firstly, the teaching interaction procedure consists of the systematization of the learning of social skills through their division into smaller portions and the demonstration of the skill by the person that is acting as a teacher, who is in charge of giving feedback and directing the role-playing (Leaf et al., 2009). Comparing the effectiveness of this method with that of social stories in a study with six children and preadolescents, the latter method showed inferior results (Leaf et al., 2012).

Secondly, social stories were compared with the cool versus not cool method. According to Leaf et al. (2016), this is a program in which the teacher performs a demonstration of a specific behavior in its appropriate (or cool) form and in its inappropriate (or not cool) form. The results obtained were significantly higher than those of social stories, when applied and compared in the study analyzed (Leaf et al., 2016).

Thirdly, Daneshvar et al. (2018) compared the use of social stories with the use of photographic images of behavioral repertoires that present the behaviors broken down into smaller units, thus facilitating comprehension. This method was more effective than social stories (Daneshvar et al., 2018).

Finally, video modeling involves the performance of a behavior by an observer that is similar to the behavior shown by a model on a video tape (Nikopoulos & Keenan, 2004),

whereby the model is videotaped performing the action that is intended to be taught to the person. O'Handley et al. (2015) found that video modeling was more effective than social stories in terms of increasing visual contact in people with ASD, both in training contexts and in generalization to other contexts.

DISCUSSION

One of the main limitations that characterizes most of the analyzed studies -except Golzari et al. (2015), Hutchins and Prelock (2013), and Schwartzberg and Silverman (2013)- is that very small subject samples are frequently used, from a single case to six participants in most of them. Therefore, they are unrepresentative and scarcely generalizable samples.

Regarding the effectiveness in different age groups, social stories seem to be more effective when they are aimed at the child and pre-adolescent population, while the results are more variable when they are aimed at adolescents and adults. However, the majority of the research studies carried out used samples of children, so it would be necessary to extend the age range in order to determine their effectiveness.

From the analysis of the effectiveness of social stories depending on whether the aim is to implement/increase a behavior or eliminate/reduce a behavior, we find results in favor of the first objective. Most of the studies established aimed at implementing new behaviors (17 studies versus 5), so it is necessary to evaluate the effectiveness of social stories when the objective is aimed at eliminating or limiting behaviors.

Regarding the environment of application, the results show a clear positive effect of the application if it is carried out by people from the closest environment, such as family members and teachers, compared to when it is done by external persons, such as researchers. These results are in favor of the current family-centered intervention approach, which considers family training as a valuable therapeutic tool for the person with disability (McWilliam, 2010; Peralta-López & Arellano-Torres, 2010), given that the family can generate multiple opportunities for learning skills and abilities in various areas of the person's functioning.

In terms of social validity, social stories are a tool with a wide social validity from family members, professionals, classmates, and people with ASD themselves. Thus, they may be a useful resource to facilitate interaction and promote social integration.

Finally, compared to other methods, social stories show certain limitations in the achievement of short- and medium-term objectives. This, together with the limitations previously exposed, leads us to consider that their empirical validity should be contrasted with a greater number of investigations.

CONCLUSIONS

Although there is a need for a greater number of studies aimed at contrasting the validity and effectiveness of social stories in the intervention in people with ASD, it should be noted that social stories have several advantages in application in the



therapeutic field. Their high degree of individualization and the specification of visual cues allow us to take advantage of the learning potential of these individuals. Additionally, making explicit and accessible the potential situations and/or responses of other people, as well as how to respond to them, can favor the compensation of difficulties in theory of mind (Hutchins & Prelock, 2018). In addition, the fact that social stories have a high level of social value for parents and teachers (Ozdemir, 2008b), facilitates their use in natural contexts.

The use of social stories by teachers and educators in an appropriate and rigorous way could optimize the learning of skills and abilities in certain areas in students with ASD. The intervention should be recorded daily in order to check the progression and/or determine the introduction of possible changes (Qi, Barton, Collier, Lin, & Montoya, 2018). The most appropriate format for presenting the stories must also be evaluated (Karal & Wolfe, 2018) and their adequate adaptation to the characteristics and needs of each individual ensured.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest.

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