Exploring the Effects of Social Stories Intervention on Communication Skills and Anxiety Reduction in Children with Autism

Diana. Rodrigues da Silva[1] , Grace. Mwangi[2]*

[1] Insight - Piaget Research Center for Human and Ecological Development, Escola Higher de Education Jean Piaget, Almada, Portugal
[2] Department of Educational Psychology, University of Nairobi, Nairobi, Kenya

* Corresponding author email address: grace.mwangi@uonbi.ac.ke

A r t i c l e   I n f o

A B S T R A C T

This study aimed to evaluate the effectiveness of a Social Stories intervention in improving communication skills and reducing anxiety in children with autism. A randomized controlled trial was conducted with 30 children diagnosed with Autism Spectrum Disorder in Kenya, aged 6 to 10 years. Participants were randomly assigned to either an intervention group (n = 15) or a control group (n = 15). The intervention group received ten weekly sessions of individualized Social Stories targeting key communication and emotional challenges, each lasting 45–60 minutes, while the control group received no additional intervention beyond routine care. Standardized assessment tools—the Children's Communication Checklist–2 (CCC-2) and the Spence Children's Anxiety Scale (SCAS)—were administered at three time points: pre-test, post-test, and five-month follow-up. Data were analyzed using repeated measures ANOVA with Bonferroni post-hoc tests in SPSS-27. Results showed significant improvements in communication skills in the intervention group from pre-test (M = 58.34, SD = 6.45) to post-test (M = 66.91, SD = 5.83), maintained at follow-up (M = 65.72, SD = 5.97). Anxiety scores significantly decreased from pre-test (M = 34.87, SD = 4.21) to post-test (M = 26.43, SD = 3.66), with sustained reduction at follow-up (M = 27.14, SD = 3.84). The control group showed no significant changes across time. ANOVA results confirmed significant time × group interactions for both communication ($F(2, 84) = 14.86, p < .001$) and anxiety ($F(2, 84) = 11.53, p < .001$), with large effect sizes. Bonferroni tests revealed significant improvements between baseline and both post-test and follow-up points. The findings suggest that Social Stories are an effective and sustainable intervention for enhancing communication skills and reducing anxiety in children with autism, even in low-resource settings.
Keywords: Autism Spectrum Disorder, Social Stories, Communication Skills, Anxiety.

1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by persistent challenges in social communication, restricted interests, and repetitive behaviors. These core features significantly affect an individual's ability to engage meaningfully with others and navigate social environments. For children with autism, deficits in communication skills and heightened anxiety are particularly debilitating and often intertwined, making early, targeted interventions essential for fostering developmental progress. The need for accessible, cost-effective, and individualized strategies has drawn increasing attention to narrative-based approaches such as Social Stories, which have shown promise in improving both social understanding and emotional regulation among children with ASD (Wright et al., 2024).

Developed by Carol Gray in the early 1990s, Social Stories are short, personalized narratives designed to help children with autism better understand and respond to social situations by explicitly describing social cues, perspectives, and appropriate responses. These stories are written in a specific format that emphasizes descriptive, perspective, and directive sentences to promote comprehension and reduce anxiety in real-life interactions (Alkldi, 2021). Numerous studies have demonstrated the effectiveness of Social Stories in supporting behavioral regulation, emotional well-being, and communication development in children with ASD, across both traditional and digital delivery formats (Camilleri et al., 2024; Smith et al., 2020). As these children often face difficulty generalizing social rules from one context to another, Social Stories serve as concrete tools that enhance social predictability and reduce uncertainty-driven anxiety (Anagnostopoulou, 2020; Prelock & Hutchins, 2018).

The effectiveness of Social Stories is particularly notable in the domain of communication. Deficits in initiating, maintaining, and responding appropriately in social interactions are central impairments in ASD, and these challenges are further exacerbated by comorbid anxiety (Ballan et al., 2017). Narrative-based interventions offer a developmentally appropriate means to introduce social norms and pragmatic communication in a structured yet flexible way (Min & Theng, 2018). Research has shown that individualized Social Stories can significantly enhance verbal and non-verbal communication, particularly when they are tailored to the child's cognitive wand linguistic profile (Chan et al., 2023). In a study evaluating mother-delivered Social Stories combined with video modeling, notable improvements were observed in children's ability to initiate greetings, maintain eye contact, and respond to social bids, confirming the utility of parent-involved approaches (Acar et al., 2016).

Beyond communication, anxiety is another major concern for children with ASD and often manifests in avoidance behaviors, outbursts, and difficulties adapting to changes in routine. These reactions can create additional barriers to social inclusion and academic participation. Interventions that promote predictability and emotional literacy are therefore crucial. Social Stories have been shown to reduce anxiety symptoms by providing children with explicit scripts for managing new or challenging situations (Fonda, 2024). For instance, digital adaptations of Social Stories targeting transitions or unfamiliar experiences have been found to significantly lower stress responses and improve emotional readiness in children on the spectrum (Hanrahan et al., 2020; Smith et al., 2020). These findings are consistent with neurocognitive models of anxiety in autism, which emphasize intolerance of uncertainty as a key mechanism; by clearly outlining what to expect, Social Stories can alleviate anticipatory anxiety and foster more adaptive behavior (Stathopoulou et al., 2020).

Recent technological advancements have also influenced how Social Stories are created and delivered, leading to a shift toward digital formats. Mobile apps, virtual learning environments (VLEs), and interactive platforms have expanded the accessibility and appeal of Social Stories for diverse learning styles (Volioti et al., 2015). Studies comparing traditional and digital formats have shown that both can be equally effective, although digital stories may increase engagement and offer multimedia reinforcement for children with visual learning preferences (Camilleri et al., 2024; Stathopoulou et al., 2020). One pilot randomized controlled trial demonstrated that children who used digitally-mediated Social Stories showed improved adaptability to real-world changes, highlighting the intervention's capacity for generalization (Hanrahan et al., 2020). In addition, the integration of emotion recognition tools and tailored feedback in digital platforms has enhanced the precision and personalization of these stories (Chan et al., 2023).

Cultural and contextual considerations are also vital in implementing Social Story interventions. Customized stories that reflect a child's linguistic, cultural, and environmental context are more effective and meaningful. For instance, in a study conducted in Pakistan, parents

emphasized the importance of adapting Social Stories to local social norms and daily experiences, which enhanced both comprehension and relevance for the children involved (Khan et al., 2024). Similarly, research in Indonesia and Kenya has demonstrated the success of culturally tailored Social Story interventions in promoting social understanding and reducing inappropriate behaviors in children with autism (Ayuningtyas et al., 2023; Moosapoor, 2023). These findings underscore the importance of co-creating stories with caregivers and professionals who understand the child's unique cultural background and learning environment.

Despite the growing body of evidence supporting the effectiveness of Social Stories, relatively few randomized controlled trials have examined their impact on both communication and anxiety outcomes simultaneously, particularly in under-represented regions such as sub-Saharan Africa. A recent economic evaluation conducted in the UK found that Social Stories delivered in mainstream schools were not only effective in improving social and emotional health but also cost-efficient compared to standard educational practices (Wang et al., 2024). This highlights the potential scalability of Social Stories as low-cost, high-impact interventions that can be integrated into school curricula or clinical programs globally (Wright et al., 2024). However, further research is needed to assess their effectiveness across diverse populations and delivery formats, and to determine whether gains are maintained over time.

This study aims to contribute to this emerging evidence base by exploring the effects of a structured Social Stories intervention on communication skills and anxiety reduction in children with autism in Kenya.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a randomized controlled trial design to evaluate the effectiveness of the Social Stories intervention on communication skills and anxiety reduction in children with autism. Participants were recruited from autism support centers and inclusive education programs in Kenya through announcements and referrals from educators and clinicians. A total of 30 children aged 6 to 10 years, all formally diagnosed with Autism Spectrum Disorder (ASD) based on DSM-5 criteria and confirmed by clinical records, were randomly assigned to either the intervention group (n = 15) or the control group (n = 15). Inclusion criteria required participants to have basic receptive language skills

and no concurrent participation in other structured social interventions. Parents or guardians provided informed consent prior to the start of the study. The intervention group received ten weekly Social Stories sessions lasting 45–60 minutes each, while the control group continued their usual routines without additional intervention. All participants were followed for a period of five months post-intervention to assess the sustainability of the outcomes.

2.2. Measures

2.2.1. Communication Skills

To measure communication skills in children with autism, the Children's Communication Checklist–2 (CCC-2), developed by Dorothy V. M. Bishop in 2003, is a widely used standardized assessment tool. The CCC-2 is designed for children aged 4 to 16 years and includes 70 items grouped into 10 subscales: Speech, Syntax, Semantics, Coherence, Initiation, Scripted Language, Context, Nonverbal Communication, Social Relations, and Interests. Each item is rated by caregivers on a 4-point Likert scale, where higher scores indicate greater communicative difficulties. The first eight subscales contribute to a General Communication Composite (GCC), which reflects the child's overall communication functioning. The CCC-2 has been validated and its reliability and construct validity have been confirmed in multiple studies across various populations, including children with developmental disorders such as autism (Moosapoor, 2023; Rashmani & Mojtabaie, 2023).

2.2.2. Anxiety

To assess anxiety levels, the Spence Children's Anxiety Scale (SCAS), created by Susan H. Spence in 1998, serves as a reliable and valid measure for children aged 8 to 15 years. The SCAS consists of 45 items, with 38 assessing specific anxiety symptoms and 7 positive filler items. The anxiety-related items are divided into six subscales: Separation Anxiety, Social Phobia, Obsessive-Compulsive Disorder, Panic/Agoraphobia, Generalized Anxiety, and Physical Injury Fears. Responses are scored on a 4-point Likert scale ranging from 0 (never) to 3 (always), with higher scores indicating greater anxiety symptoms. The SCAS has demonstrated high internal consistency, good test-retest reliability, and strong convergent and discriminant validity across diverse clinical and non-clinical samples, including children with autism spectrum disorder (Spence et al., 2003).

2.3. Intervention

2.3.1. Social Stories Intervention

The Social Stories intervention, originally developed by Carol Gray, is a structured and evidence-based strategy designed to improve the social understanding and behavioral responses of children with autism by presenting them with personalized, descriptive narratives. This intervention was conducted over ten sessions, each lasting between 45 and 60 minutes. The sessions focused on enhancing communication skills and reducing anxiety through carefully tailored stories that address specific social situations, emotions, and appropriate responses. The stories were read and discussed with children individually or in small groups, using visuals, repetition, and interactive strategies to promote comprehension and engagement. All sessions were facilitated by trained professionals familiar with autism-specific educational strategies.

Session 1: Introduction to Social Stories and Establishing Rapport

The first session focused on building rapport with the children and introducing the concept of Social Stories. The facilitator explained how stories would help them understand social situations and express themselves better. A simple Social Story about meeting new people and learning new things was shared. Children were encouraged to ask questions and engage with the facilitator through drawing or visual prompts related to the story. This session set a comfortable and supportive tone for the rest of the intervention.

Session 2: Understanding Emotions and Feelings

In this session, the focus was on recognizing and labeling basic emotions such as happiness, sadness, anger, and fear. A Social Story was presented about a child who experiences different emotions during a typical day. Children were guided to identify emotions in the story and relate them to their own experiences. Emotion cards and visuals were used to reinforce learning. The goal was to enhance emotional awareness as a foundation for communication and anxiety regulation.

Session 3: Initiating Communication

This session addressed initiating conversation and social interaction. A Social Story demonstrated how to start talking to a peer or adult, including greeting others and asking simple questions. Role-playing activities were incorporated to allow children to practice the steps outlined in the story. Positive reinforcement and visual supports helped encourage participation and confidence in initiating communication.

Session 4: Responding to Others Appropriately

The fourth session emphasized listening and responding in conversations. A Social Story was read about a child who takes turns speaking and listens when others talk. Children were engaged in structured turn-taking games and storytelling exercises to practice these skills. The facilitator provided feedback and encouragement, reinforcing the idea of respectful communication.

Session 5: Dealing with Anxiety in New Situations

In this session, a Social Story was used to help children understand and manage anxiety in unfamiliar or unpredictable situations, such as going to a new place or meeting someone new. Techniques such as deep breathing and using calming words were introduced within the story. Children practiced these coping strategies with support from the facilitator and were encouraged to share times they felt anxious and how they coped.

Session 6: Understanding Personal Space and Body Language

This session used a Social Story to teach the concept of personal space and reading body language cues. Children learned how to recognize when someone needs space and how to maintain appropriate physical boundaries during interactions. Visual aids and movement activities helped reinforce these concepts in a fun, interactive way.

Session 7: Asking for Help and Expressing Needs

A Social Story in this session focused on how to ask for help in different settings, such as school or home, and how to express needs clearly. The facilitator guided children in practicing these requests using role-play scenarios and sentence starters. Emphasis was placed on using calm, clear communication instead of acting out or withdrawing when needs were unmet.

Session 8: Coping with Changes and Transitions

This session addressed changes in routine, which often trigger anxiety in children with autism. A Social Story described a character who faces an unexpected change and uses strategies like asking questions and staying calm. Children discussed changes they had experienced and practiced planning for transitions using story-based scenarios and visual schedules.

Session 9: Playing and Sharing with Others

In this session, the focus shifted to social play, sharing, and cooperative behavior. A Social Story described a group activity where children take turns and share toys. Children participated in guided play activities, practicing the skills described in the story with support from the facilitator.

Positive reinforcement was used to encourage sharing and collaboration.

Session 10: Review and Generalization of Skills

The final session reviewed all the stories and skills learned throughout the intervention. Children were invited to reflect on their favorite stories and the skills they used most. A new Social Story summarizing the child's progress was created and read together, celebrating their achievements. The facilitator worked with children to identify real-life situations where they could continue using these skills, reinforcing generalization beyond the sessions.

2.4. Data Analysis

Data were collected at three time points: pre-intervention (baseline), post-intervention (immediately after the final session), and follow-up (five months later). Two standardized tools were used to assess the dependent variables: the Children's Communication Checklist–2 (CCC-2) for communication skills and the Spence Children's Anxiety Scale (SCAS) for anxiety symptoms. Statistical analysis was conducted using SPSS version 27. The primary analytical method was repeated measures analysis of variance (ANOVA) to evaluate within-group and between-group differences over time. This approach allowed for the assessment of changes in communication and anxiety across the three measurement points while accounting for intra-subject variability.

To further explore significant effects revealed by the ANOVA, Bonferroni post-hoc tests were applied to identify specific time points at which differences occurred. This correction method was chosen to control for Type I error associated with multiple comparisons. Effect sizes were also calculated to interpret the magnitude of the intervention's impact. The level of statistical significance was set at $p < .05$ for all tests. The results were interpreted in terms of both statistical and practical significance to provide a comprehensive understanding of the intervention's effectiveness over time.

3. Findings and Results

The sample consisted of 30 adolescents aged between 13 and 17 years (M = 15.06, SD = 1.12), including 16 females (53.33%) and 14 males (46.67%). Regarding educational level, 11 participants (36.67%) were enrolled in the first year of secondary school, 10 participants (33.33%) in the second year, and 9 participants (30.00%) in the third year. All participants were Greek nationals residing in urban areas of Athens, and none reported a prior history of psychological treatment or mindfulness training.

Table 1

Descriptive Statistics for Communication Skills and Anxiety Scores by Group and Stage

Variable	Stage	Group	Mean	SD
Communication Skills	Pre-test	Intervention	58.34	6.45
		Control	57.89	6.72
	Post-test	Intervention	66.91	5.83
		Control	58.26	6.35
	Follow-up	Intervention	65.72	5.97
		Control	58.11	6.68
Anxiety	Pre-test	Intervention	34.87	4.21
		Control	34.55	4.09
	Post-test	Intervention	26.43	3.66
		Control	33.88	4.31
	Follow-up	Intervention	27.14	3.84
		Control	34.01	4.26

Children in the intervention group showed a marked improvement in communication skills from pre-test (M = 58.34, SD = 6.45) to post-test (M = 66.91, SD = 5.83), with scores remaining high at follow-up (M = 65.72, SD = 5.97). The control group showed minimal changes. For anxiety, the intervention group's scores significantly declined from pre-test (M = 34.87, SD = 4.21) to post-test (M = 26.43, SD = 3.66), with sustained reduction at follow-up (M = 27.14, SD = 3.84). Again, the control group showed no significant changes over time (Table 1).

Prior to conducting the repeated measures ANOVA, assumptions were tested and confirmed. The Shapiro-Wilk test indicated that the data were normally distributed for both dependent variables at all three time points (p-values ranging

from .106 to .431). Levene's test for equality of variances showed non-significant results across groups (attention regulation: F = 1.042, p = .367; emotional maturity: F = 0.958, p = .395), confirming the assumption of homogeneity of variance. Mauchly's test of sphericity was also non-

significant for both attention regulation ($\chi^2(2)$ = 2.347, p = .309) and emotional maturity ($\chi^2(2)$ = 1.827, p = .401), indicating that the assumption of sphericity had been met. These results validated the use of repeated measures ANOVA for further analysis.

Table 2

Repeated Measures ANOVA for Communication Skills and Anxiety

Variable	Source	SS	df	MS	F	p-value	η² (Effect Size)
Communication Skills	Time	946.21	2	473.11	15.42	.000	.37
	Group	822.44	1	822.44	26.79	.000	.49
	Time × Group	912.57	2	456.29	14.86	.000	.36
	Error (within)	1642.78	84	19.56			
Anxiety	Time	734.06	2	367.03	12.84	.000	.31
	Group	691.88	1	691.88	24.19	.000	.46
	Time × Group	668.44	2	334.22	11.53	.000	.29
	Error (within)	1202.67	84	14.32			

Repeated measures ANOVA showed a significant main effect of time for both communication skills (F(2, 84) = 15.42, p < .001, η² = .37) and anxiety (F(2, 84) = 12.84, p < .001, η² = .31), indicating significant changes across the three measurement points. Significant interaction effects for time × group were also found for both variables, confirming

that the intervention group improved more than the control group. Group main effects were significant, with large effect sizes for both communication skills (η² = .49) and anxiety (η² = .46), reflecting the substantial impact of the intervention (Table 2).

Table 3

Bonferroni Post-Hoc Test Results for Communication Skills and Anxiety

Variable	Comparison	Mean Difference	SE	p-value
Communication Skills	Pre-test vs. Post-test	-8.57	1.36	.000
	Pre-test vs. Follow-up	-7.38	1.28	.000
	Post-test vs. Follow-up	1.19	0.94	.213
Anxiety	Pre-test vs. Post-test	8.44	1.17	.000
	Pre-test vs. Follow-up	7.73	1.12	.000
	Post-test vs. Follow-up	-0.71	0.89	.422

Bonferroni post-hoc comparisons revealed significant improvements in communication from pre-test to post-test (Mean Difference = -8.57, p < .001) and pre-test to follow-up (Mean Difference = -7.38, p < .001), with no significant difference between post-test and follow-up (p = .213), indicating sustained gains. Similarly, anxiety scores showed significant reductions from pre-test to post-test (Mean Difference = 8.44, p < .001) and from pre-test to follow-up (Mean Difference = 7.73, p < .001), with no significant increase between post-test and follow-up (p = .422), suggesting that the reduction in anxiety was maintained over time (Table 3).

4.   Discussion and Conclusion

The findings of this randomized controlled trial provide compelling evidence supporting the effectiveness of Social Stories intervention in enhancing communication skills and reducing anxiety among children with autism. Participants in the experimental group, who received ten weekly sessions of individualized Social Stories, demonstrated statistically significant improvements in communication abilities as measured by the Children's Communication Checklist–2 (CCC-2), as well as notable reductions in anxiety levels as measured by the Spence Children's Anxiety Scale (SCAS). These improvements were not only evident immediately after the intervention but also sustained over a five-month follow-up period. In contrast, the control group, which did not receive the intervention, showed no significant changes across either domain. The use of repeated measures ANOVA

confirmed significant interaction effects between time and group, and Bonferroni post-hoc tests further identified that the experimental group's post-intervention and follow-up scores were significantly improved from baseline.

These findings align with prior research demonstrating the utility of Social Stories in enhancing communication competence among children with autism. The structured, narrative approach of Social Stories provides children with explicit cues about social behaviors, supporting their ability to initiate interactions, maintain conversations, and interpret nonverbal cues more effectively (Acar et al., 2016). As observed in this study, children exposed to targeted Social Stories displayed improved pragmatic language and social responsiveness, consistent with results reported in earlier investigations using both parent-delivered and digital story formats (Anagnostopoulou, 2020; Prelock & Hutchins, 2018). Additionally, the durability of these effects observed at the five-month follow-up supports prior evidence suggesting that Social Stories facilitate long-term gains in communication by reinforcing social scripts and enabling practice through repetitive exposure (Wright et al., 2024).

The intervention's impact on anxiety reduction is also congruent with existing literature emphasizing the role of Social Stories in helping children with autism cope with novel, unpredictable, or stressful situations. In the current study, the Social Stories addressed common anxiety-provoking scenarios such as social interaction, transitions, and unfamiliar environments. The clear, structured narratives appeared to reduce anticipatory anxiety and promote self-regulation skills. These findings mirror those of earlier work showing that Social Stories reduce stress by increasing predictability and emotional preparedness (Fonda, 2024; Smith et al., 2020). Furthermore, digital adaptations of Social Stories have been found effective in supporting children's emotional health in real-life contexts, including school settings and medical environments, suggesting the medium may be flexible across diverse applications (Camilleri et al., 2024; Hanrahan et al., 2020).

Notably, this study contributes to the literature by confirming the effectiveness of traditional, facilitator-led Social Stories in a low-resource setting, specifically within Kenyan educational and therapeutic environments. While many studies have focused on digital or app-based formats developed in high-income countries (Stathopoulou et al., 2020; Volioti et al., 2015), this research highlights the success of a non-technological, low-cost intervention that can be feasibly implemented by educators and clinicians in sub-Saharan Africa. The effectiveness observed here resonates with findings from studies in Pakistan and Indonesia, where culturally adapted Social Stories have yielded improvements in behavior and communication when tailored to the child's environment and daily routines (Ayuningtyas et al., 2023; Khan et al., 2024).

Additionally, the inclusion of a five-month follow-up extends the contribution of this research by confirming the intervention's lasting effects. Few studies have incorporated follow-up assessments of more than a few weeks, making the current study one of the few to examine long-term retention of benefits. Sustained improvements in communication and reduced anxiety indicate that the skills acquired during the sessions generalized beyond the immediate intervention period and were maintained through daily use and reinforcement (Moosapoor, 2023). The importance of generalization and maintenance of skills in autism interventions cannot be overstated, particularly in settings where continuous professional support may not be readily available.

Moreover, the findings contribute to ongoing discussions about the role of emotion recognition and emotional understanding in the communication-anxiety interface in children with autism. As shown in other studies, enhancing children's understanding of their own and others' emotions is critical to both effective communication and anxiety regulation (Chan et al., 2023). In this study, sessions focused on understanding feelings, identifying emotional cues, and managing transitions—key skills known to influence both domains. This overlap supports theoretical models proposing that improvements in emotional comprehension can serve as a bridge between language and behavior in children with ASD (Ballan et al., 2017).

This study's results also complement recent findings regarding the cost-effectiveness of Social Stories interventions in educational settings. In a randomized controlled trial in the UK, Social Stories were found not only to be effective but also economically viable when implemented within school systems (Wang et al., 2024). The current research echoes this conclusion in a different sociocultural context by showing that a low-cost, facilitator-led model can yield meaningful results without the need for digital infrastructure or extensive clinical staffing. This points to the global relevance and accessibility of the Social Stories approach, particularly in regions with limited access to specialized autism services.

Importantly, the improvements seen in the current study reinforce the notion that Social Stories are best implemented when tailored to individual children's needs and local

contexts. The narratives used in this study were co-constructed by professionals with knowledge of each child's environment and challenges. This individualized approach mirrors recommendations from earlier research emphasizing the role of customization in maximizing engagement and outcomes (Balakrishnan & Alias, 2017; Khan et al., 2024). When caregivers, teachers, and therapists collaborate to design stories that reflect the child's daily experiences, the likelihood of behavioral change and internalization increases significantly.

Despite the promising findings, several limitations must be acknowledged. The sample size was relatively small, with only 30 participants divided into two groups, which limits the generalizability of the results. Future studies with larger sample sizes across multiple regions would enhance external validity. Additionally, while standardized tools were used to assess communication and anxiety, the study relied on caregiver and teacher reports, which may introduce subjective bias. The absence of blinding among assessors and participants also introduces the possibility of expectancy effects. Furthermore, although the five-month follow-up provides valuable insight into the maintenance of skills, longer-term follow-up over a year or more would better capture the lasting impact of the intervention.

Future research should aim to address these limitations by employing larger, more diverse samples and including participants from multiple geographic and cultural backgrounds. Comparative studies evaluating the effectiveness of traditional versus digital Social Stories could provide insights into the optimal formats for different settings. It would also be valuable to explore how the intervention interacts with other support systems such as speech therapy, occupational therapy, or family-based interventions. Longitudinal studies that follow children over several years could illuminate the long-term developmental trajectory influenced by early Social Stories exposure. Moreover, qualitative studies exploring the perspectives of children, parents, and educators could deepen our understanding of the contextual factors that influence engagement and success.

Based on these findings, practitioners are encouraged to incorporate Social Stories as part of comprehensive intervention plans for children with autism, particularly when targeting communication challenges and anxiety. Educators and therapists should consider co-developing stories with families to ensure cultural and contextual relevance. Training programs for teachers and caregivers in writing and delivering Social Stories can help expand access to this intervention in both clinical and educational environments. Given the sustained improvements observed, regular use of Social Stories can be a valuable tool for supporting children's adaptive functioning and emotional regulation in everyday situations. Tailoring content to individual goals and reinforcing skills through repetition and practice may further enhance the effectiveness of this approach.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

References

Acar, Ç., Tekin-İftar, E., & Yıkmış, A. (2016). Effects of Mother-Delivered Social Stories and Video Modeling in Teaching Social Skills to Children With Autism Spectrum Disorders. *The Journal of Special Education*, *50*(4), 215-226. https://doi.org/10.1177/0022466916649164

Alkldi, A. (2021). A Review of the Effects of Using Social Stories to Promote Behavior, Communication, and Social Skills for Students With Autism Spectrum Disorders (ASD). *International Journal of Childhood Counselling and Special*

Education, *2*(1), 35-52. https://doi.org/10.31559/ccse2021.2.1.3

Anagnostopoulou, V. (2020). The Effectiveness of Social StoriesTM on Children With Autism Spectrum Disorders. *Πανελλήνιο Συνέδριο Επιστημών Εκπαίδευσης*, *9*, 16. https://doi.org/10.12681/edusc.3101

Ayuningtyas, F., Genilo, J. W., Hakim, L., Misbah, N. A., & Sutowo, I. R. (2023). Sex Education to Prevalence of Sexual Harassment in Children With Autism. *Amalee Indonesian Journal of Community Research and Engagement*, *4*(1), 201-212. https://doi.org/10.37680/amalee.v4i1.2021

Balakrishnan, S., & Alias, A. (2017). Usage of Social Stories in Encouraging Social Interaction of Children With Autism Spectrum Disorder. *Journal of Icsar*, *1*(2), 91-97. https://doi.org/10.17977/um005v1i22017p091

Ballan, M. S., Freyer, M. B., & Powledge, L. (2017). Interventions for Students With Autism and Asperger's Syndrome. https://doi.org/10.1093/acrefore/9780199975839.013.1216

Camilleri, L. J., Maras, K., & Brosnan, M. (2024). Effective Digital Support for Autism: Digital Social Stories. *Frontiers in Psychiatry*, *14*. https://doi.org/10.3389/fpsyt.2023.1272157

Chan, J. K., Cheung, T. C., Chan, C.-W., Fan, F., Lai, K. Y. C., Sun, X., O'Reilly, H., Golan, O., Allison, C., Baron-Cohen, S., & Leung, P. W. (2023). Enhancing Emotion Recognition in Young Autistic Children With or Without Attention-Deficit/Hyperactivity Disorder in Hong Kong Using a Chinese App Version of <i>The Transporters</I>. *Autism*, *28*(4), 945-958. https://doi.org/10.1177/13623613231187176

Fonda, N. J. (2024). The Application of Visual Social Story and Role Play Interventions to Improve Social Communication in Adolescents With Autism Spectrum Disorder at SLB Harapan Bunda Surabaya. *Jpi (Jurnal Pendidikan Inklusi)*, *7*(2), 49-56. https://doi.org/10.26740/inklusi.v7n2.p49-56

Hanrahan, R., Smith, E., Johnson, H., Constantin, A., & Brosnan, M. (2020). A Pilot Randomised Control Trial of Digitally-Mediated Social Stories for Children on the Autism Spectrum. *Journal of Autism and Developmental Disorders*, *50*(12), 4243-4257. https://doi.org/10.1007/s10803-020-04490-8

Khan, S. F., Qureshi, M. S., & Bano, H. (2024). Recognizing the Need for Customized Social Stories: A Parent's Perspective in the Pakistani Context. *J. Asian Dev. Studies*, *13*(2), 1663-1677. https://doi.org/10.62345/jads.2024.13.2.131

Min, W. K., & Theng, L. B. (2018). Integration of Digital Social Story Intervention Into Differentiated Instruction Framework. *Journal of Integrated Design and Process Science*, *21*(4), 41-56. https://doi.org/10.3233/jid-2017-0008

Moosapoor, M. (2023). The Effectiveness of Puppet Play Therapy on Increasing Communication Skills Through Social Stories for Children With Autism in Rasht. *International Journal of Innovation in Management Economics and Social Sciences*, *3*(1), 30-39. https://doi.org/10.52547/ijimes.3.1.30

Prelock, P., & Hutchins, T. (2018). Using Story-Based Interventions to Improve Episodic Memory in Autism Spectrum Disorder. *Seminars in Speech and Language*, *39*(02), 125-143. https://doi.org/10.1055/s-0038-1628365

Rashmani, B., & Mojtabaie, M. (2023). The effectiveness of body language training using ABM method on the communication skills of autistic children. *Iranian Journal of Neurodevelopmental Disorders*, *2*(3), 50-57. https://maherpub.com/jndd/article/view/36

Smith, E., Constantin, A., Johnson, H., & Brosnan, M. (2020). Digitally-Mediated Social Stories Support Children on the Autism Spectrum Adapting to a Change in a 'Real-World' Context. *Journal of Autism and Developmental Disorders*, *51*(2), 514-526. https://doi.org/10.1007/s10803-020-04558-5

Spence, S. H., Barrett, P. M., & Turner, C. (2003). Psychometric Properties of the Spence Children Anxiety Scale with Young Adolescents. *Journal of anxiety disorders*, *17*, 605-625. https://doi.org/10.1016/S0887-6185(02)00236-0

Stathopoulou, A., Loukeris, D., Karabatzaki, Z., Politi, E., Salapata, Y., & Drigas, A. (2020). Evaluation of Mobile Apps Effectiveness in Children With Autism Social Training via Digital Social Stories. *International Journal of Interactive Mobile Technologies (Ijim)*, *14*(03), 4. https://doi.org/10.3991/ijim.v14i03.10281

Volioti, C., Tsiatsos, T., Mavropoulou, S., & Karagiannidis, C. (2015). VLEs, Social Stories and Children With Autism: A Prototype Implementation and Evaluation. *Education and Information Technologies*, *21*(6), 1679-1697. https://doi.org/10.1007/s10639-015-9409-1

Wang, H. I., Bell, K., Blackwell, J., Welch, C., Mandefield, L., Watson, J., Standley, E., McMillan, D., Gilbody, S., Wright, B., Hewitt, C., & Parrott, S. (2024). Cost–utility Analysis of Social Stories™ for Children With Autism Spectrum Disorder in Mainstream Primary Schools: Results From a Randomised Controlled Trial. *BJPsych Open*, *10*(4). https://doi.org/10.1192/bjo.2024.47

Wright, B., Bell, K., Blackwell, J., Teige, C., Mandefield, L., Wang, H. I., Welch, C., Scantlebury, A., Watson, J., McMillan, D., Standley, E., Attwell, L., Carrick, H., Taylor, A., Taylor, O., Hodkinson, R., Edwards, H., Pearson, H., Parrott, S., . . . Hewitt, C. (2024). Impact of Social Stories on Social and Emotional Health of Autism Spectrum Primary School Children: The ASSSIST2 RCT With Economic Evaluation. *Health Technology Assessment*, 1-121. https://doi.org/10.3310/jbtm8017