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The effectiveness of social stories in an intervention program in late adolescence with high functioning autism spectrum disorders: A case study report

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ABSTRACT: People with high-functioning autism (HFA) demonstrated significant social skill deficits compared to those typically developing. Relatively limited data is still known about the challenges faced (friendship, social networks) by adolescents with HFA and so far with a delayed diagnosis. The case study aimed to investigate social stories' effectiveness by using an intensive intervention approach on a late-adolescent female with autism. A 17-year-old girl with a recent diagnosis of HFA was selected as a case study from a private Speech and Language Therapy Center to involve in an immediate intervention program. A single-case research design was used to monitor changes after an intervention. Specifically, observation and training lasted four weeks, plus two weeks of maintenance. The intervention was done exclusively with social stories personalised to her needs. The targeted behaviours were to enhance social interaction skills, especially her ability to make friends and improve communication. There was a positive response from the young female in the intensive intervention program. Moreover, she displayed more positive peer interaction throughout the intervention program (6 weeks). She managed to participate and ask peers to companies in High school, to start a conversation, and to call them into her house in a positive way 44 times in 6 weeks. In addition, after every intervention week, we recorded an increase in her positive interactions with peers. The results demonstrate that social story use enhances HFA adolescents' social engagement. This study provides insights into the relationship between intensive social story intervention, social communication and social interaction behaviours between adolescents with a recent diagnosis of HFA and peers. Moreover, the findings support the effectiveness of social stories in encouraging social interaction of a late adolescent with HFA.

Keywords: High functioning autism; Late adolescence; Case study; Social stories; Newly diagnosed

1.0 INTRODUCTION

The term high-functioning autism refers to people who belong to the autism spectrum and are characterised by cognitive and/or language skills that range from average to above average for their age. The acronym "HFA" is often used to describe people in this range (Diehl et al., 2013). Usually, people with high-functioning autism demonstrate significant social skill deficits, speech and prosody deficits, and problem behaviours relative to the typically developing people, which is clear from childhood (Macintosh & Dissanayake, 2006). This results in adverse reactions that gradually push into exclusion and isolation by removing social interactions (Shriberg et al., 2001).

In addition, the literature on the outcome for individuals with high-functioning autism shows that the vast majority managed to study or be educated at a college or university (Shattuck et al., 2007). Nevertheless, few of them manage to be autonomous and live semi-independently, have close and spontaneous friendships, get married, or even have a paid job (Howlin, 2000; Shattuck et al., 2011; Tsatsanis, 2003). The female gender may receive more pressure due to experiences of underemployment and unemployment, leading to adverse economic, social, and health results (Hayward et al., 2018).

1.1 Late adolescence and challenges

The developmental phase of "late adolescence/ emerging adulthood" ranges between 17 and 25 years (Jaworska & MacQueen, 2015; Tambelli et al., 2021). In addition, it is particularly critical developmental phase for individuals with autism, as they face challenges related to social interaction, social communication, dependence on others, and the impact of comorbidity on mental health issues (Gerhardt, 2006; Schall et al., 2006; Seltzer et al., 2004; Shattuck et al., 2011). The literature supports that social difficulties are independent of age and developmental level, and their impact may increase during adolescence (Barendse et al., 2018). Moreover, psychosocial functioning appears to be impacted in HFA adolescents, and developmental differences in severity appeared (Foley-Nicpon et al., 2010).

Social impairment is the most permanent symptom in children, adolescents, and young adults with autism (Shattuck et al., 2007). The literature illustrates that late adolescents and young adults must continue speech therapy, psychotherapy, and other forms of intervention, as comorbid conditions indicate a range of needs for comparable services (Shattuck et al., 2011).

Many studies have been performed on social impairments in children and adolescents with ASD with low functioning levels. Still, the research focusing on social-cognitive function in high-functioning adolescents with ASD is limited (Barendse et al., 2018). In addition, few studies have been conducted on therapeutic approaches for late adolescents and young adults with ASD, and therefore limited data is available on specific therapeutic strategies and their effectiveness (Taylor et al., 2012).

1.2 Social Stories as an effective intervention

According to Baron-Cohen et al. (1985), it is crucial to have the theory of mind and understand other persons' emotions, intentions, beliefs, and knowledge for successful social interaction. Children with ASD often face difficulties imputing beliefs to others and are thus at a grave disadvantage when predicting other people's behaviour. Furthermore, it is predictable that autistic children who fail to use a theory of mind will show social impairments. Social cognition in HFA has received less attention from researchers, particularly throughout adolescence, when social skills are essential for establishing and maintaining successful social interactions with peers (Barendse et al., 2018).

Many children and adolescents with ASD benefit from effective intensive behavioural therapy that reduce their impairment (Chen et al., 2020). Social stories (SS) may be a beneficial intervention (Wright & McCathren, 2012). In addition, SS, which was developed in 1993 (Gray & Garand, 1993), is accurate, simple to understand by children with ASD, describes a variety of social settings using unique phrases or stories that stipulate how a person should act in different contexts or scenarios (Chen et al., 2020). Also, SS uses visual learning strategies, which are very helpful in children with ASD, and social stories can easily be used across settings and implementers because they do not require special training to implement (Wright & McCathren, 2012).

Social stories aim to teach children and adolescents with ASD to have more socially appropriate behaviours and less disruptive behaviours. Also, SS is characterised by flexibility, capacity, and individualisation (Chen et al., 2020; Wright & McCathren, 2012). As an intervention for children with ASD, Social Stories have been found by the National Autism Center to be an effective research-based intervention (Randolph, 2009) and whereas many other studies confirmed SS's positive impact on behaviour modification (Camilleri et al., 2021; Crozier & Tincani, 2005; Nichols et al., 2005; Sansosti et al., 2004; Wright & McCathren, 2012). It is important to emphasise that the abovementioned studies have not been performed on HFA.

1.3 The research gap

Even while this field of study is starting to gain more attention, relatively limited data is still known about the challenges faced (friendship, social networks) by adolescents with high-functioning autism and so far with a delayed diagnosis (Chen et al., 2020; Locke et al., 2010). This research gap could be filled by investigating the efficacy of Social Stories for adolescents with high-functioning autism, exploring how the intervention can be adapted for this age group, and assessing the impact of the intervention on social functioning in this population.

The research gap is more extensive in the intervention that HFA female adolescents could follow, as the females are often delayed in receiving a diagnosis, leading to missed opportunities for early intervention (Bargiela et al., 2016; Green et al., 2019; Lai et al., 2015). Specifically, autism is being overlooked in females because the signs are much more evident in males, and females could sometimes be detected in older age, requiring late intervention (Lai et al., 2015; Volkers, 2018). It is a fact that a late diagnosis is a complicated process, and there is limited information on how the basic features of ASD are manifested in this age group (Bargiela et al., 2016).

1.4 Aim of the study

The case study aimed to investigate the effectiveness of social stories, following an intensive intervention, in a late adolescent female diagnosed with autism.

2.0 METHODS

2.1 Characteristics of the participant

The 17 years old female was diagnosed a month ago with HFA. The diagnosis was conducted according to the International Classification of Diseases (ICD) (World Health Organization, 2018). The diagnosis described social (pragmatic) communication deficits. Nevertheless, her diagnosis of high-functioning autism came late in her 17s. In the context of the study, it is observed that she still faces social interaction issues, so she is characterised as shy, with a lack of initiative in contacts, and sharp in communication. Regarding verbal communication, she presents a significant challenge in social conciliation, and it is not easy to start a discussion and maintain a topic. At the same time, her speech is characterised by prosodic elements. It was found that non-verbal communication presents reduced eye contact, severe difficulty in abstract concepts, implying comprehension, and the rationalisation of emotions. These deficiencies negatively affected her sociability and the creation of friendly relationships, resulting in her isolation.

2.2 Design, setting and procedure

This participant was selected as a case study from a private Speech and Language Therapy Center as her parents/caregivers are searching to involve in an immediate intervention program. Her selection for the study was based on her very recent diagnosis (1 month from the diagnosis announcement) and the absence of previous intervention. It is noted that the young female, as a late adolescent, lives with her family in a rural area in Greece and used to face many difficulties such as excessive stress, inability to concentrate and perform, pragmatics weakness, as well as serious difficulty in socialising and maintain friendships over time. The participant's legal guardian/next of kin provided written informed consent to participate in this study. Also, written informed consent was obtained from the individual(s) and minor(s)' legal guardian/next of kin to publish any potentially identifiable images or data in this article.

A single-case research design was used in this study, which is commonly used in research on human behaviour to monitor changes that occur after the intervention, and the participant serves as his control (Balakrishnan & Alias, 2017). An A-B-A-B design was used, whereby A represented the Baseline and B represented the Intervention (Balakrishnan & Alias, 2017; Kratochwill et al., 2010; Norris & Dattilo, 1999).

According to the literature (Balakrishnan & Alias, 2017; Norris & Dattilo, 1999), we followed the methodology described below (**Table 1**). The Social Story Checklist, as outlined by Gray in 2014, was employed to verify that all social stories created adhered to the prescribed criteria for constructing suitable social stories

(Gray, 2014). In more detail, the criteria were: 1) the Social Story Goal, 2) Two-Step Discovery, 3) Three-Parts & a Title, 4) Four·mat Makes it Mine!, 5) Five Factors Define Voice & Vocabulary, 6) Six Questions Guide Story Development, 7) Seven is About Sentences, 8) A Gr·eight! Formula, 9) Nine to Refine, 10) Ten Guides to Editing and Implementation (Gray, 2014).

Table 1. Summary of methodology for human behaviour monitoring and interventions

Stage	Description
Baseline 1 (A)	Observation and data recording
Intervention 1 (B)	Introduction verbally of the written personalised social stories. The young female was monitored, and data was recorded.
Baseline 2 (A)	The young female was observed for a second time. Data from observation was recorded.
Intervention 2 (B)	The social stories were reread, the young female was monitored again, and data was recorded.
Social stories maintenance weeks	Two weeks of maintenance followed, and the young female was monitored for a final time again to get an outcome.

Specifically, we started the observation and training, which lasted four weeks, plus two weeks of maintenance. A psychologist and a speech-language therapist conducted the training sessions. Parents, private educators, psychologists, and speech-language therapists were involved in observing and recording her daily contexts and activities. An observation sheet was shared, and they were informed about the process and appropriately trained on how to complete the observation sheets daily and every week filed the sheets. The frequency of the intervention program with SS was four sessions per week, 45 minutes per session. Also, her parents were involved in recording some of the observations in different places. It is worth noting that the young female did not participate in other interventions simultaneously or before she was diagnosed with HFA.

Social stories were personalised to her needs. We wrote and read social stories about the intervention target. The targeted behaviours were to enhance social interaction skills, especially her ability to make friends (**Table 2**) and improve communication.

Table 2: Examples of making friends from Social Stories (SS) used in the intervention

Page number (title of SS)	Description
1st (Making Friends)	a) A picture of three adolescents. In this case, we use a girl in the centre of the picture, referring to her and one girl and one boy on each side.
2nd (I want to make friends)	a) A picture of the three adolescents next to a High School. b) Text to read: I am a student at XXXX High School. I want to make friends at school. I need to learn to be a good friend to make friends.
3rd (Share things)	a) A picture that describes a young girl giving a book to a girl. b) Text to read: A good friend knows how to share. Sharing means letting other people have a turn. I can share my personal things (something appropriate).
4th (Share things is happiness)	a) A picture with the two adolescents smiling. b) When I share, it makes other people happy. Other youngers want to be my friend when I share things.
5th (Nice smile)	a) A picture with the female adolescent saying "nice smile" to the other female adolescent. b) Text to read: A good friend is nice to others. Being nice means making other people feel good. I can make people feel good by saying nice things.
6th (Smiling)	a) A picture with the other female adolescent smiling. b) Text to read: Giving a friend a compliment is nice. It makes them feel good.
7th (Quiet)	a) A picture with the female adolescent making quiet. b) Text to read: If I cannot think of something nice to say, then I can stay quiet.
8th (Quiet and happy)	a) A picture with the female adolescent making quiet as before, one picture with the happy faces of her friend and her High School teacher. b) Text to read: When I am nice instead of mean, my friends and teachers are happy.

3.0 RESULTS

Findings indicated a positive response from the young female in the intensive intervention program. Moreover, she displayed more positive peer interaction throughout the intervention program (6 weeks). She managed to participate and ask peers to companies in high school to start a conversation to call them into her house positively 44 times in 6 weeks (**Table 3** and **Figure 1**).

Table 3. Positive interactions of the young female with peers per week

Stage	Number of positive interaction with peers
Baseline I (A)	2
Intervention I (B)	5
Baseline II (A)	7
Intervention II (B)	9
Maintenance week 1	10
Maintenance week 2	11

Baseline 1 (one-week observation and preparation)
She has never received a formal ASD diagnosis until recently. She has a learning capacity equal to and above her age. Despite having strong reading and writing skills, she has social anxiety. Before the intervention, she lacked friendships, and she could not have frequent conversations with any of her peers and only talked to them in special cases of need. In some cases, her interaction with peers was non-existent daily. She attempted to join her peers' group but usually was unaware of the right words she needed to use during a conversation with his peers. This often leads to her peers not seeking her to join their group. We personalise social stories for her, start conversations, build friendships, and maintain appropriate conversations with his peers by picturing the goal, gathering information, tailoring the text, and avoiding using words that may cause her anxiety or distress. Also, we focused on improving her understanding and expression of jokes and figurative language comprehension, including metaphors and verbal irony.

We used simple text, pictures, and illustrations to identify the importance of social interaction. We introduced and defined key vocabularies like friendship and kindness and explained social events like birthday parties. We introduced concepts about her daily life, including the environments she acts. Some examples of SS titles were: How to start a conversation appropriately, ask something from peers, and how to keep up a conversation.

Intervention 1 (one week with four sessions,
45 minutes per session)
The social stories were read and explained to her. After the first intervention, she increased the positive interactions from 2 to 5 per week. Moreover, she could use more appropriate words in conversations with peers and joined in a group for a more extended period.

Baseline 2 (one week without sessions)
During baseline 2, no social story developed or received the corresponding intervention, yet she managed to maintain and increase positive discrepancies with her peers. The frequency was seven times a week. She attempted to join her peer's group successfully and used appropriate words during a conversation with his peers.

Intervention 2 (one week with four sessions,
45 minutes per session)
The social stories are reread to serve as a reminder. After intervention 2, she used suitable words and language when speaking to her peers. Also, she successfully responded to the social story intervention and showed progress throughout the intervention.

Maintenance 1 and 2 (two weeks without sessions)
After the intensive intervention finished, she was followed for two weeks by the interdisciplinary team. The 2-week period was an observation of how she socially interacted in her daily environments. We recorded again her positive responses She indicated a slight improvement, and she managed to maintain her progress during the maintenance period (2 weeks), where she displayed positive peer interaction 10 and 11 times, respectively, each week.

Specifically, with the girl's social interaction, it was observed that week by week, it increased significantly as it has and is evident from **Table 3**. Although it increased significantly, it appeared to need special reinforcement in verbal pragmatics will be particularly important. Emphasis should be placed on the design of the intervention. The overall improved picture of social interaction also showed us some qualitative evidence about starting conversations with peers, such as improved eye contact and a change in body posture as she stood with her head down and maintained the

dialogue. In addition, he appeared to use more vocabulary with expressions that denoted politeness. Although significant progress was made, unfortunately, in terms of friendship and building friendship, not very important steps were taken so that he could build and develop, to some extent, a rudimentary company with a peer. In this matter, we can say that we had some very initial faint steps towards building friendships with peers, and it is crucial to continue the intensive intervention with SS at an unabated pace.

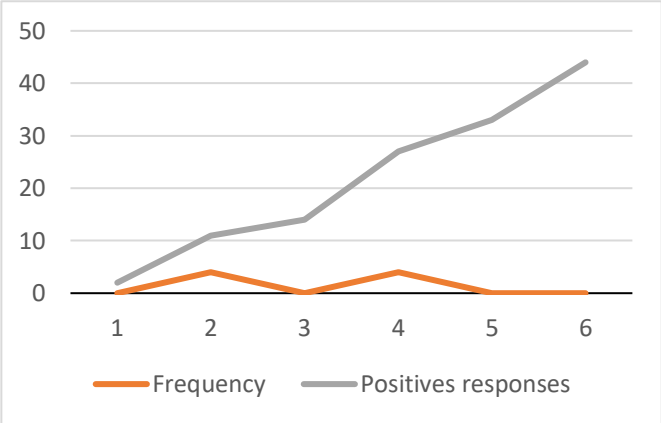

Figure 1. The number of positive responses in comparison to the frequency of interventions throughout six weeks.

5.0 DISCUSSION

The study aimed to investigate the effectiveness of social stories in late adolescence in a young female with a newly ASD diagnosis.

The results of this study demonstrate that social story use does enhance HFA adolescents' social engagement. In addition, after every intervention week, we recorded an increase in her positive interactions with peers. These findings are in the same line with other studies on children and adolescents with ASD on the effectiveness of social storytelling (Anthony & Bobzien, 2022; Balakrishnan & Alias, 2017; Foster, 2015; Saad, 2016; Sansosti et al., 2004;). The late adolescent female showed positive outcomes from the first intervention week.

The intervention is planned to be more intensive. The study follows an intensive intervention approach within a few weeks. Specifically, the participant had four sessions per week with a duration of 45 minutes per session. The positive outcomes from the literature about the intensity of the intervention enhanced our findings (Adams et al., 2012). In children and adolescents with pragmatic and social communication problems, there is some evidence of an intensive intervention effect (Adams et al., 2012).

How the SS is presented (written and verbally) increases effectiveness and success (Iliff, 2011). When verbal prompting is attempted in the intervention program leads to a higher level of success of the targeted behaviour compared to the baseline (Balakrishnan & Alias, 2017; Crozier & Tincani, 2007), and verbal social stories are a moderately effective intervention (Iliff, 2011). Improving social interaction was greatly aided by SS. Demonstrated a significant degree of appropriate social interaction in various situations with different interlocutors. Moreover, her passive attitude and the absence of cues to communicate decreased significantly and gradually, while she managed to maintain her focus on a topic of discussion. Similar findings have been found in other studies in adolescents and adults with ASD. Studies found that people with autism significantly improved by reducing corresponding behaviours to the aforementioned (Fisher et al., 2013; Rehfeldt & Chambers, 2003; Saggu, 2015).

In addition, the intervention through SS improved the understanding and expression of jokes and figurative language comprehension, including metaphors and verbal irony. In particular, it helped to practice with social stories used for this purpose and read, discuss, and explain some uncomplicated jokes. After all, understanding jokes and being able to tell a joke can be one of the best predictors of social success for a person with ASD. Also, as recently explored, good and developed language skills result in better figurative language comprehension, including metaphors and verbal irony, in people with ASD (Kalandadze et al., 2018).

5.1 Limitations

The strong point of the study was the immediate involvement in an intensive intervention of an adolescent with a recent diagnosis (1 month after) of HFA. Therefore, some important limitations exist in this study presented here. The lack of observations many weeks before the start of the interventions limited the acquisition of a complete understanding of the external variables that may have impacted the results. Moreover, another limitation is that the study did not include a control group or other forms of control that would enable one to attribute interventions received. Furthermore, the sample size is small, consisting of only one participant. As a case study, our research

aimed to provide in-depth insights into the effectiveness of the intervention program for the specific individual in question. Therefore, it is difficult to generalise the findings to a larger population. Additionally, the duration of the intervention is relatively short, lasting only six weeks, which may not be sufficient to evaluate the program's long-term effectiveness.

6.0 CONCLUSION

Findings indicated a positive response from the young female in the intensive intervention program. Moreover, she displayed more positive peer interaction throughout the intervention program (6 weeks). She managed to participate and ask peers to companies in High school to start a conversation and call them into her house positively 44 times in 6 weeks. This study provides insights into the relationship between intensive social story intervention and social communication and social interaction behaviours between a high school student with a recent diagnosis of High Functioning Autism (HFA) and her peers. Moreover, the findings support the effectiveness of social stories in encouraging social interaction of a late adolescent with HFA. In addition, Social Stories were effective as they helped the young female improve her ability to make friends and communicate. In conclusion, the cooperation of many factors was necessary to reach this successful study result. Parents, teachers, and co-therapists all actively participated in the study and collaborated to achieve this positive outcome.

6.1 Future directions

Although social stories were written specifically for adolescents with HFA, groups with different diagnoses could be featured in studies on social stories. As referred in the literature (Saad, 2016), many adolescents with emotional and behavioural disorders have emerged needs (academic, behavioural, and social) that may impact their quality of life. Further research should explore the potential benefits of the social stories' intervention, including large-scale studies, the exact influence of student attendance, teacher involvement and training, and treatment duration and intensity. Finally, in future research, it should be considered that social stories can be presented to adolescents with similar difficulties through the technology-based social story format, as shown in the literature (Anthony & Bobzien, 2022), as long as people with autism agree that the format is preferable.

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