

Innovations

Social Skills Training for Children and Adolescents with Autism Spectrum Disorder: A Systematic Review

¹Oluwatomilola Adewunmi, ¹Sussan Adeusi, ¹Temiloluwa Arotiba

¹Olusegun Adeeko, ¹Deborah Olarinde

¹Department of Psychology, Covenant University, Ota, Ogun state

Corresponding Author: [Oluwatomilola Adewunmi](#)

Abstract: *This review investigated the impact of Social Skills Training (SST) on children and adolescents with Autism Spectrum Disorder (ASD). Social Skills Training is one of the most widely utilised interventions for addressing social skills deficiencies in children and adolescents with ASD. The study comprised a total of 12 studies that met the inclusion criteria. Four research questions were formulated to guide the investigation. The synthesis of these studies demonstrated that SST is helpful for boosting social engagement and communication, decreasing parental stress, and reducing emotional problems associated with ASD in children and adolescents. In addition, more than half of the studies found that lengthier durations of SST resulted in the maintenance of treatment gains months after the SST programme and the generalisation of social skills to other elements of life and situations. Due to the fact that the follow-up data were based on unblinded reports from parents and teachers, which are susceptible to bias, these results should be regarded with caution.*

Keywords: *Social Skills Training, Autism Spectrum Disorder, Children, Adolescents, Social Skills.*

As defined by the DSM-V, Autism Spectrum Disorder (ASD) is a condition marked by difficulty in social communication and repetitive, confined patterns of behaviour, interest, or activity (American Psychiatric Association, 2013). Individuals with ASD are socially incompetent, lack the ability to communicate effectively, and engage in repetitive behaviours. Disruption of normal patterns of social communication and interaction are two key features of ASD, according to the DSM-V (American Psychiatric Association, 2013). These people have a wide variety of socially impaired behaviour that affects or disrupts their social competence in many areas of

life, including school, family and work, treatment is the only way to improve this social dysfunction. (Laugeson & Frankel 2010; Sadolescentsel & Heeman 2017).

Children with ASD have a hard time switching between tasks, which has a severe impact on their academic achievement and everyday life. Children and adolescents with ASD who struggle with social skills can benefit from a variety of programmes that help them gain self-confidence and take back control of their social interactions. When it comes to treating ASD symptoms, pharmacotherapy, parent training and education, behavioural therapies like Behaviour Rehearsal, Modelling, Role-play and Reinforcement, Early Intensive Behavioural Interventions (EIBI) and Complementary and Alternative Medicine are frequently used (Leaf, Oppenheim-Leaf, Call, Sheldon, Sherman, & Taubman, 2012; Reichow, Barton, Boyd, & Hume, 2012; Bordini et al., 2020). All these interventions help individuals with ASD develop their attention, social and communication skills.

Social skills training (SST) is one of the most often utilised ways for enhancing or regulating social interactions and communications in populations with social deficiencies. The body of research supporting the usefulness of SST for children and adolescents with ASD has grown in the past couple of decades (Kasari, Rotheram Fuller, Locke, and Gulsrud, 2012; Reichow et al., 2012; Dekker et al., 2018; Yamada et al., 2019; Bordini et al., 2020). SST is a type of intervention that employs socially instructional tactics and behaviour modification concepts and is beneficial to children and adolescents with ASD (Einfield et al., 2017; Jonsson et al., 2018; Tripathi, Estabillo, Moody & Laugeson, 2021). Trainers, teachers, and therapists frequently employ this training, in some cases, teachers and parents get active in children's training (Dekker et al., 2018; Okajima et al., 2019; Yamada et al., 2019). Socializing and adhering to social norms are the primary functions of this intervention. Social skills training includes teaching youngsters how to read ambiguous social cues, such as when to switch tasks and the capacity to recognise the emotions of individuals around them (Szumski, Smogorzewska, Grygiel & Orlando, 2017; Tripathi et al., 2021). Role-playing, Video Modelling activities, games, Behaviour Rehearsal are effective ways for persons with ASD to practise social skills. Short-term social skills training normally lasts between 8 and 12 weeks and is usually conducted in groups rather than one-on-one (Ong et al., 2021; Okajima, et al., 2021).

The data supporting the effectiveness of SST for children and adolescents with social communication challenges has grown significantly in ASD and other neurodevelopmental disorders with social communication deficiencies (Jonsson, et al., 2017; Yamada, et al., 2019). However, there is strong evidence that many of these interventions are helpful in teaching social knowledge (Gates, Kang, & Lerner,

2017), but increases in social performance have not been persuasively proven (Becker, Erica, Rogers & Burrows, 2017; Dekker et al.,2018).

Furthermore, SST in Autism Spectrum Disorder aims to improve social skills long after the programme is over. This intervention has been shown to have short-term benefits, but long-term follow-up data is generally inadequate, making it difficult to draw conclusions on long-term effects and sustainability of the treatments (Wolstencroft, Robinson, Srinivasan, Kerry, Mandy, Skuse 2018; Gates, Kang and Lerner, 2017).It is critical, then, to use research-based therapies, one of which is Social Skills Training to help people with ASD improve their social skills and communication. To guide this research, two research questions were generated, first is to find out the effect of SST on children and adolescents with ASD and the second is to know if social skills training gains generalized outside training of children and adolescents with ASD.

Methods

Research design

The procedure to the review was compliant with the protocols outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.

Search Strategy

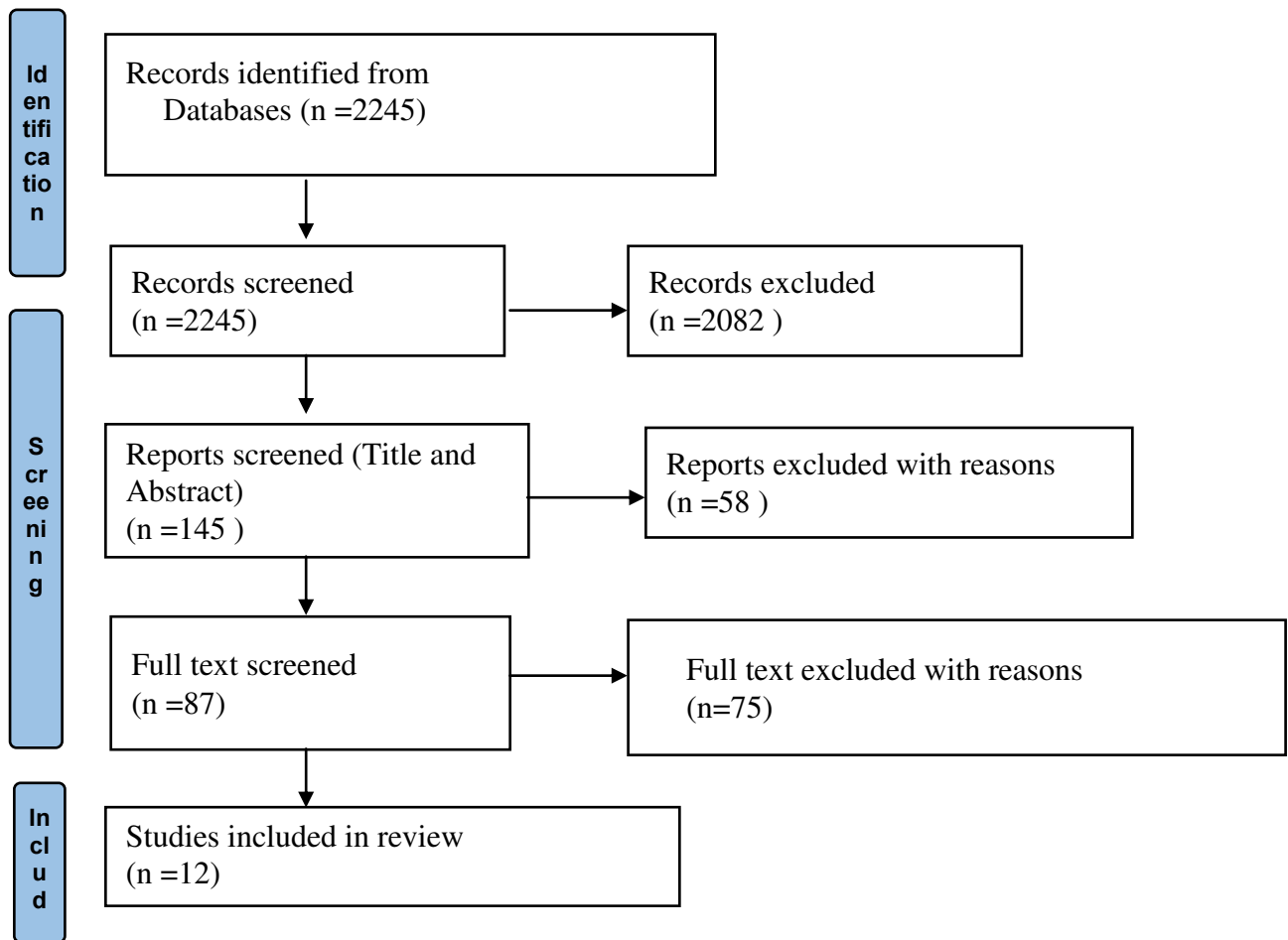
To get data for this review, the following research databases were searched: SCOPUS index journals, PubMed, and Science Direct using the following keywords: “social skills training” OR “social skills interventions” AND “Autism Spectrum Disorder” / “High-Functioning Autism” AND “Children” AND “Adolescents”. Time restriction was set from 2017 till date. Only papers published or translated in English were included in the review.

Inclusion and Exclusion Criteria

The selected articles were strictly based on randomized control trials and experimental research. ASD, Asperger's disorder, and pervasive developmental disorder not otherwise specified (PDD-NOS) are all included in this article. The articles focused on the use of social skills training techniques (role play, video modeling, rehearsal, positive feedback, instructions, etc.) either group or individual based in managing social deficits in children and adolescents with ASD. In this study, there were no limits on the number of participants. Systematic, meta-analysis and narrative review articles were not included in the study. Articles that incorporated parents or teachers in social skills training were also accepted, however, articles that utilised computer-based or virtual social skills training were excluded.

Data Extraction

The full search yielded 2,245 studies. There was a total of 2,233 studies that did not match the inclusion criteria and were therefore excluded. Not explicitly evaluating the effectiveness of Social Skills Training in controlling ASD in children and adolescents, duplicated research, abstracts only, virtual and computer based SST, meta-analyses, and systematic reviews are reasons for excluding these papers. There were twelve studies included in this review. (See details in Figure 1.)



**Figure 1: Flow chart of study selection
Summary of Reviewed Studies**

Table 1: Summary of the data retrieved from the reviewed studies as well as their findings.

First author, Year, Country	N	Mean age (SD)	Design	Outcome	Intervention	Results
Dekker, et al., 2018. Netherlands	N Total:122 N SST:47 N SST-PTI:51 N CAU:24	SST: 10.9 (0.7) SST-PTI: 10.9 (0.8) CAU: 11.2 (0.9)	Randomized control trial (RCT)	Vineland Adaptive Behavior Scales—Survey version (VABS-S), ESTIA training-specific skills, Social Skills Rating Scale parent version (SSRS-P)	Social Skills Group, and Social Skills Training-Parent and Teacher involvement 15 sessions. 6 months follow up.	The primary and secondary outcomes of both SSTs improved significantly more than CAU at post-treatment, with no difference between post-treatment and follow-up. Parental and teacher engagement increased treatment intensity but had no additional effect on children compared to SST alone. 6 months later, no change in performance was noticed.
Jonsson, et al., 2018 Sweden	N Total:50 N KONTAKT-SC: 23 N SC:27	KONTAKT-SC: 13.04 (2.58) SC: 12.63 (2.83)	RCT	Social Responsiveness Scale-2, (SRS-2), Adaptive Behavior Assessment System II (ABAS-II), Perceived Stress Scale (PSS)	KONTAKT program 24 sessions 3 months follow up.	Improvement in social interaction skills. Three months after the end of the programme, the gains were still present.

<p>Okajima, et al., 2021 Japan</p>	<p>N total: 22 N Exp: 11 N control: 11</p>	<p>Exp: 8.0 (0.7) Control: 7.5 (1.1)</p>	<p>Quasi-experimental</p>	<p>SRS-2, General Health Questionnaire-28: GHQ-28, Parental Stress Index: PSI</p>	<p>SST based on ABA Contingency Learning for parents 12 sessions. 3 months follow up.</p>	<p>Autistic symptoms like social cognition, social motivation, and autistic mannerisms, improved in the TG compared to the TAU group in the PT session. The TG group's social abilities increased substantially more than those in the waiting group. Parent-rated GHQ and PSI remained improved at the three-month follow-up.</p>
<p>Yamada, et al., 2019 Japan</p>	<p>N Total: 28 N Exp: 14 N Control: 14</p>	<p>Exp: 13.00 (1.26) Control: 13.17 (1.04)</p>	<p>Quasi-experimental</p>	<p>SRS-2, Quality of Play Questionnaire-Adolescent (QPQ-A), Quality of Play Questionnaire-Parent (QPQ-P), and VABS-2</p>	<p>Program for the Education and Enrichment of Relational Skills (PEERS) 14 sessions. 3 months follow up</p>	<p>In terms of socialisation, communication, knowledge of social skills, autistic characteristics, and behavioural and emotional difficulties, positive results were identified. In addition, at a three-month follow-up examination, most treatment improvements remained. According to them, involving the parents in their child's treatment also helped them retain their progress.</p>

	<p>Einfeld, et al., 2017 USA</p>	<p>Exp: 10.3 (1.6) Control: 10.9 (1.4)</p>	<p>RCT</p>	<p>Social Communication Questionnaire (SCQ), Social Skills Questionnaire – Parent and Teacher forms (SSQ-P; SSQ-T), Emotion Regulation and Social Skills Questionnaire – Parent & Teacher forms. (ERSSQ-P; ERSSQ-T).</p>	<p>The Secret Agent Society (SAS) Program 23 sessions 12months follow up</p>	<p>After the intervention, parental and child measurements of social interaction and communication improved, but not in the waitlist condition. At 12 months follow-up, advances in parent, child, and teacher reports of social skills were evident, as well as in school-measured gains.</p>
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<p>Tripathi, et al., 2021 USA</p>	<p>N/A</p>	<p>4-6years</p>		<p>SRS-2, Quality of Play Questionnaire, SSIS Rating Scales, and PSI.</p>	<p>UCLA PEERS for Preschoolers Program 16 Sessions.</p>	<p>One to five years after therapy, a total of 29 parents provided information on their children and families' well-being. Results showed that treatment advantages in social communication, social motivation, social responsiveness, and peer involvement were maintained. Long-term follow-up showed that reductions in problem behaviours and parenting stress following therapy were not sustained.</p>
<p>Radley, et al., 2017 USA</p>	<p>N total= 5</p>	<p>4-6years</p>	<p>Experimental: multiple probe across behaviors with concurrent replication across participants design</p>	<p>The Parenting Stress Index: Short Form, Parent-Child Dysfunctional Interaction (P-CDI), Difficult Child (DC).</p>	<p>Superheroes Social Skills program 10 sessions</p>	<p>The intensity and frequency of skill demonstration by peers with shared social deficits increased over time as a result of intervention involvement. There was a noticeable improvement in the Total Social Functioning for each participant's parents following social skills training.</p>

Ong, et al., 2021 Maylasia	N total: 30	7 8 (26.6) 8 10 (33.33) 9 5 (16.66) 10 2 (6.66) 11 2 (6.66) 12 3 (10)	Quasi Experimental Design	SSIS Rating Scales, QPO-P	Children's Friendship Training (CFT) 12 sessions 12 weeks follow up	The quality of the friendships of children with ASD increased before and after the intervention, although the level of participation remained the same. ' There was conclusive evidence that children with ASD benefited socially and in terms of friendship quality from parent-assisted CFTs.
Becker, et al., 2017 USA	N total: 31 Exp: 17 Control: 14	Exp: 10 (1.7) Control : 12 (1.6)	a between-within repeated measures design	Reading the Mind in the Eyes Test (RMET), Social Language Development Test (SLDT), and SRS-2.	Animal Assisted SST 12 sessions	Participants in the SST groups with dogs were deemed significantly less symptomatic than those in the conventional social skills group after completing the programme. Traditional training methods may not be as effective as animal-assisted social skills training, according to the current research findings.

<p>Szumski, et al., 2017</p>	<p>N total=52 N PT/ST =14 N ICPS=12 N control:26</p>	<p>PT/ST group: 5,4 years (SD=0.83); ICPS group: 5,0 years (SD=1.2); control group: 4,9 years (SD=1.2)</p>	<p>Experimental</p>	<p>The Taxonomy of Problematic Social Situations for Children, The Teacher Impression Scale (TIS)</p>	<p>Play Time/Social Time ICPS Program 67 sessions-pt/st 54-ICPS</p>	<p>Children who participate in PT/ST and ICPS therapies rather than the standard preschool curriculum develop interactional skills and strategies for coping with difficult social circumstances more effectively.</p>
<p>Chester, et al., 2019 Australia</p>	<p>N Total: 45 Semi-structured: 15 Unstructured: 15 Control: 15</p>	<p>Semi-structured: 9.27 (SD=1.10) Unstructured: 10.47 (SD=1.13) Control: 10.40 (SD=1.18)</p>	<p>Experimental</p>	<p>Social Communication Questionnaire—Lifetime Form (SCQ), VABS-2, SSIS, and Social Competence with Peers Questionnaire-Adult (SCP-A),</p>	<p>Social skills training and Playtime 8 sessions 3 months follow up</p>	<p>In comparison to a waiting control group, children who participated in the SST demonstrated significant gains in social skills and social competence over time.</p>

Bordini, et al., 2020 Brazil	N total=67 N Exp=34 N Control=33	Exp: 4.76 (1.23) Control : 4.84 (1.41)	A multicentre, single-blinded, randomized clinical pilot trial	VABS, The Autism Behaviour Checklist (ABC), and The Hamilton Depression Rating Scale 17 (HDRS)	Parent Training Intervention using Video Modelling 22 sessions	The intervention group saw a non-statistically significant drop in autism symptoms and a significant gain in non-verbal IQ. Video-based training for parents of children with autism and intellectual disabilities improved social interaction and competence.
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Results

The focus of the review was to find out the effectiveness of SST in managing ASD Spectrum Disorder. Two research questions were put forward to achieve this goal, namely: What is the effect of SST on children and adolescents with ASD? Are social skills training gains generalized outside training of children and adolescents with ASD?

Research Question 1: What is the effect of Social Skills Training on Children and Adolescents with Autism Spectrum Disorder?

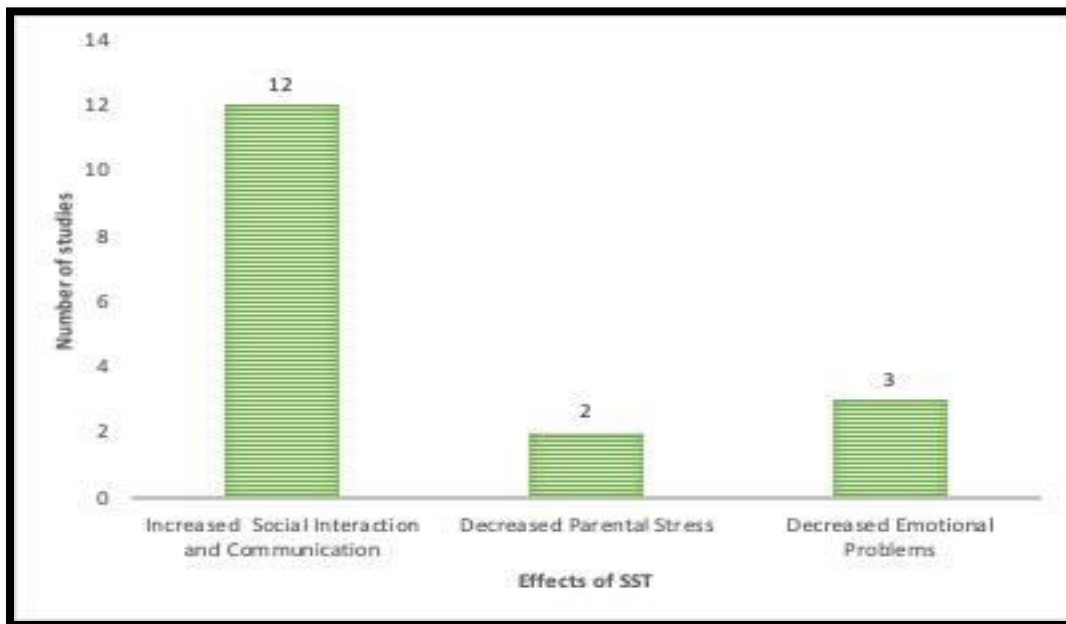


Figure 1: Bar Chart showing the number of studies and reported effects of SST on ASD

The figure 1 shows that all the studies that were looked at (n=12) reported an increased level of social interaction and communication among the children and adolescents who were exposed to social skills training in comparison with participants in the control group(Becker et al., 2017; Einfeld et al., 2017; Radley et al., 2017; Szumski et al., 2017; Dekker et al.,2018; Jonsson et al., 2018; Chester et al., 2019; Yamada et al.,2019; Bordini et al., 2020; Okajima et al., 2021; Ong et al., 2021;Triphati et al., 2021).It also shows that two of the studies (n=2) reported a significant decrease in parental stress after the treatment phase, as measured by the Parental Stress Index and as reported by the parents of the participants during the follow up period (Radley et al., 2017;Okajima et al., 2021).In addition, one-fourth (n=3) found that, participants who took part in SST had a lower overall level of emotional and behavioural problems(Becker et al., 2017;Einfeld et al., 2017; Yamada et al.,2019).

Research Question 2: Were social skills training gains generalized outside training of children and adolescents with ASD?

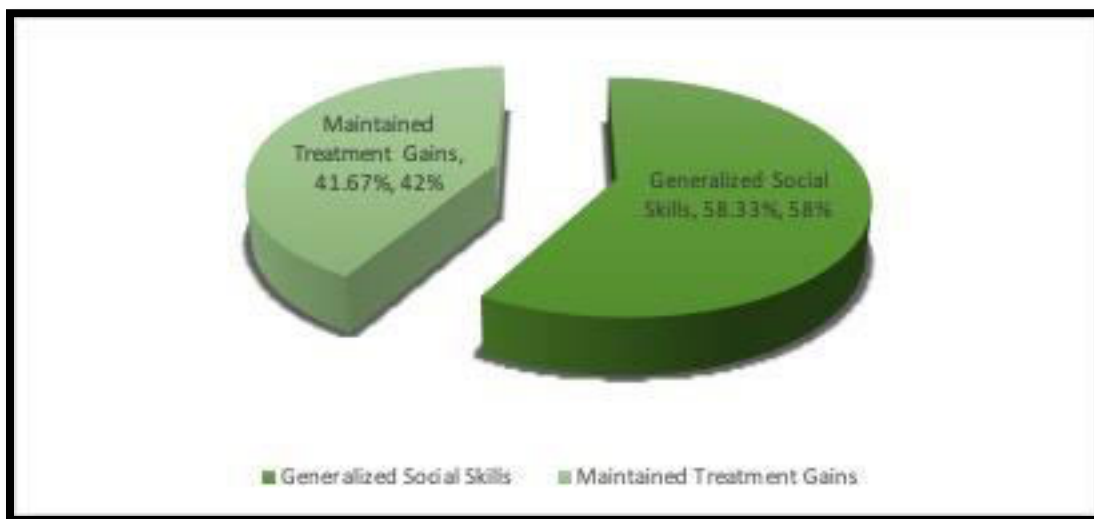


Figure2: Pie Chart showing the percentage of studies that reported generalization of SST against maintenance of SST.

Seven of the reviewed studies, representing 58.33 percent of the total, reported that the gains made in SST by children and adolescents with ASD were either generalised or improved upon during the follow-up period. (Einfeld et al., 2017; Radley et al., 2017;Szumski et al., 2017;Jonsson et al., 2018; Chester et al., 2019; Yamada et al.,2019;Triphati et al., 2021), although five (41.67 percent) of the studies did not observe improvement on the skills in SST, rather, the participants maintained the gains of treatment through the follow up period (Becker et al., 2017; Dekker et al.,2018; Bordini et al., 2020; Okajima et al., 2021; Ong et al., 2021).

Discussion

The first research question was to find the effects of SST in children and adolescents with Autism Spectrum Disorder. All the studies reviewed reported that there was increase and improvement in social interaction and social communication of children and adolescents with ASD after social skills training was administered to them. The increase in social skills is attributed to the interactions in group activities and various social skills intervention techniques such as dictatic question, modelling, role playing, behaviour rehearsal, homework and so on, employed by the research during the trainings. Participants were able to integrate the skills learnt to an extent outside the training or post treatment as reported by parents and teachers at the follow up period, they were able to converse and play with their peers, they were more engaged in social interaction and some could maintain friendship with their peers. Some of the studies showed that the participants were able to improve on the treatment gains and apply the skills gathered to other social situations different from ones trained in during follow up. In one of the examined studies, parents and adolescents reported that adolescents felt more confident when interacting with others and that the number of social gatherings increased after the treatment ended. In addition, adolescents appeared to have become more self-aware in challenging circumstances and to have begun to comprehend how to address such situations, (Yamada et al., 2019). In another study, 1–5 years following intervention, social skills and ASD-related social deficits in play and friendship-making skills not only improved but were maintained (Triphati et al., 2021).

The study also indicated a reduction in the stress experienced by participants' parents. A study found that SST therapies, such as a Parent Training programme, could reduce parental stress in parents of children with ASD. Parental stress was reduced as a result of their participation in a treatment which, at the conclusion of the treatment, was determined to be more successful for both the parent's mental health and parental stress (Okajima et al., 2021).

Furthermore, social skills training improved some of the emotional and behavioural issues linked with ASD. In one of the studies, participants were asked to score their depressive symptoms before and after the intervention, considering data indicating high levels of co-occurring depression and social isolation in youth with ASD. Both groups reported significant improvements in depressed symptoms, except Negative Mood or Physical Symptoms, following the intervention. Incorporating dogs into SST programmes appears to considerably lessen certain symptoms of depression, such as feelings of isolation and incompetence in social interactions, according to another study (Becker et al., 2017). In one of the examined studies, these outcomes were linked to parental involvement in therapy via social coaching in the home and

community, which is believed to increase the generalizability and durability of social skill gains (Yamada et al., 2019). In addition, the PEERS programme was found to lower social anxiety in its participants. Although the programme does not directly target anxiety reduction, progress in sociability and communication was found to increase confidence in interpersonal relationships, therefore reducing social anxiety.

The second research question was to find out if social skills training gains generalized outside training of children and adolescents with ASD. Participants not only maintained their treatment improvements but were also able to adapt them to settings that were not similar to those in the social skills training groups. They were able to apply and develop their understanding of each strategy to their daily social contact and communication with their peers at school, at home, in the neighbourhood, etc. According to Radley et al. (2017), participation in SST increased the degree and frequency of accurate skill demonstration for peers who shared social deficiencies from baseline to treatment and maintenance phases. They said that it is noteworthy that all participants improved in their Total Social Functioning score following social skills intervention as reported by the participants' parents. Einfeld et al., (2017) discovered that any increases found immediately post-intervention were maintained up to 12 months later at follow up, and they noticed slight ongoing improvements on some parent and school staff ratings of social skills after the intervention ended. According to ratings from parents, teachers, and children, treatment gains were recorded at follow-up and were maintained, supporting one of the study's hypotheses that skills had generalised to other aspects of the child's functioning (Chester et al., 2019). Furthermore, Yamada et al. (2019) claimed that, unlike other studies in which participants' autistic features improved considerably following treatment based on SRS-2 reports, improvement in autistic traits was shown in their study during the follow-up assessment phase.

Conclusion:

This study demonstrates that SST increased social interaction, communication and competence in children and adolescents with ASD throughout the intervention phase, and that the majority of participants retained their treatment gains during the follow-up period. A few of the examined publications also reported a reduction in parental stress, emotional and behavioural issues related with ASD. Consequently, SST is an effective treatment for children and adolescents with social interaction difficulties. In addition, social skills training aids in the acquisition of social knowledge and social performance for children and adolescents with ASD, and most of the research indicate that the acquired skills are transferable to other aspects of life.

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