

## Outcomes of Social Skill Training Program for Adolescents with Autism Spectrum Disorder: A Systematic Review

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### ABSTRACT

The present systematic review evaluates the outcomes of social skills training programs for adolescents with Autism Spectrum Disorder (ASD) by reviewing findings from 2019 to 2024. The search process was conducted using “social skill training” and “autism” keywords in two online databases that were Google scholar & Pubmed. Based on inclusion and exclusion criteria, 9 articles were reviewed out of 454 articles. The results indicate that social skills training programs like Peer mediated intervention, Kontakt, Peer network intervention and Program for the Educational and Enrichment of Relational Skills (PEERS) along with custom social skill training programs of different variables and theories can significantly affect the social skills of adolescents with ASD, improving their social communication and social interaction.

**Keywords:** *Adolescent, Autism, Social Communication, Social Interaction*

Adolescence period is marked by severe changes in biology, psychology and social dimensions of an individual. It begins with puberty and ends with adulthood responsibilities. This period revolves around peer interaction that has a significant impact on self-concept, well-being and behavior of the individual (Foulkes & Blakemore, 2018). Researchers have gained interest in how the development occurring during adolescence directly helps to shape behavior and through social environment (Berenbaum et al., 2015).

Adolescents intentionally increase their social circle and find themselves in many groups both, in and outside school (Albarello et al., 2018). Within these peer group settings, they may learn to navigate complex social dynamics, ultimately fostering social and emotional development. These experiences and learning are very common during the stage of adolescence.

On the other side there are groups of adolescents who face complex difficulties and barriers in understanding and maintaining both basic & strong social relationships. These adolescents often have neurodevelopmental disorder, largely affecting their social and emotional developmental milestones. One of these neurodevelopmental disorders is Autism spectrum disorder (ASD) marked by deficits in social communication and social interaction. Studies show that adolescents with autism experience intense challenges specifically in

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comprehending social clues and norms, which makes it difficult to manage peer relationships (Cresswell et al., 2019).

Autism spectrum disorder (ASD) is a neurodevelopmental disorder which is characterized by social communication and social interaction deficits with repetitive-restricted behavior and interest (American Psychiatric Association, 2013). Social communicative behavior deficits are fundamental traits of ASD and also serve as early indicators (Anagnostou et al., 2015). Their social deficits consist of multiple difficulties ranging from abnormality in making eye contact, lack of proper attention, strange speech connection, problems in developing and maintaining conversation, lack of abilities to solve social problems, empathy and body language problems (American Psychiatric Association, 2013; Yeo & Teng, 2015). With social deficits, autism also is defined by repetitive and restricted behavior and interest (RRBI) as one of the early and concerning signs of ASD in children. Repetitive behavior usually is characterized by doing the same thing without the significance, self-harming behaviors like biting hands, particular and specific fixations on objects and ideas, and echolalia is very common in repetitive and restricted behavior in ASD (Schulz and Stevenson, 2019).

### ***Repetitive Restricted Behavior and Interest***

As mentioned above repetitive restricted behavior and interest is one of the early indicators of ASD. Moreover, RRBI has two important subtypes. First, repetitive sensory and motor behavior that may manifest as motor stereotypes, repetitive and excessive touching and smelling of objects. Second, insistence on sameness which is characterized by following the same routine, restricted interest and rigid behavior (Allely, 2019).

### ***Social Interaction and Social Communication Deficits***

Research shows evidence that motor and social communication deficits may stem from impairment of the mirror neuron system which is generally involved in both perception & comprehension of motor action as well as higher order cognitive processes like imitation and social communication (Rochat & Berchio, 2013).

Adolescents with ASD face difficulties in specific areas of speech and language causing significant dysfunction in daily life. (Kjellmer et al., 2018) stated that ASD manifests defects in receptive and expressive structural language which create challenges in understanding & shaping language.

### ***Co-occurring Psychopathologies Among Adolescents with ASD***

Social skill impairments can have adverse effects on interpersonal relationships of adolescents with ASD (Øzerk et al., 2021). Often these adolescents face peer rejection which may lead to symptoms of depression and anxiety, a study conducted by Wright and Wachs (2019) found positive links between peer rejection and anxiety & depression among adolescents with ASD. Problems with social relationships and participating in peer groups are common in ASD, which results in feelings of loneliness. However, adolescents with ASD have distinct ways to perceive loneliness than neurotypical adolescents, very often not viewing it negatively (Siedler and Waligórska, 2020). Studies also suggest that mental health conditions are very common with ASD like mood disorders, OCD, ADHD, indicating both biological and environmental factors (Shaltout et al., 2020).

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### *Relevance of Social Skill Training for Autism Spectrum Disorder*

Social skill training can be very effective in helping Adolescents with ASD to overcome challenges of social interaction and social communication. Improving social skills of adolescents with ASD can lessen the behavior and emotional disruption, leading them to take steps towards fulfilling their potentials (Kalyvezam, 2020). There are many programmes aiming to improve social skills of adolescents with ASD, among these Program for the Education and Enrichment of Relational Skills (PEERS) has been very effective in improving social skills and friendships of individuals with ASD (Moulton & Laugeson, 2020). PEERS also has its modified version in accordance with the cultural consideration of each country.

The purpose of this review is to analyze outcomes of social skill training programs in adolescents who experience ASD. This is done to prove the effectiveness of social skill training in enhancing social communication and social interactions skills of adolescents with ASD which can become a guide and reference for future intervention programs in similar study areas.

## **METHODOLOGY**

### *Systematic Search Strategy*

To identify studies, literature was found using two online databases that were Google scholar, Pubmed. In the search process, the search is based on “social skill training” and “autism” keywords in order to simplify the process.

In the search process of the studies, specific inclusion and exclusion criteria [table no.1] were included in accordance to the relevance, time frame, significance, quality.

*Table 1 Inclusion and Exclusion Criteria*

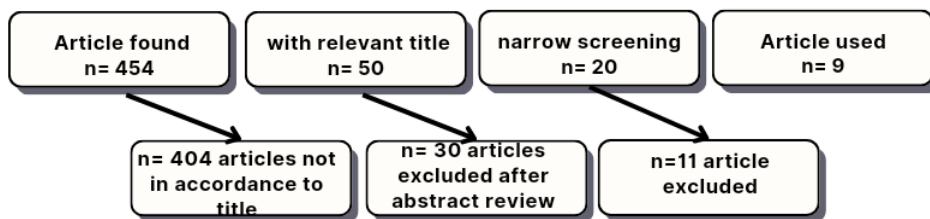
<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>
Research focusing on social skill training/programs.	Research focusing on interventions for social skill deficits rather than training/program.
Studies using samples of adolescents.	Studies using children and adults as samples or any randomized sample.
Primary studies based on experimental and other methods.	Studies focusing on reviews, meta-analysis, systematic reviews were excluded.
Latest studies from the past five years were included for the systematic review.	Multiple adaptations of the same programs or training, modified for cultural consideration were excluded.

### *Identification of the Inclusion and Exclusion Criteria*

In the search process, a total of 454 articles were found in google scholar and pubmed databases with the keywords “social skill training” & “autism”. After reading the titles for relevance, 50 papers were selected for further review. These papers were selected based on the inclusion and exclusion criteria mentioned above, which consider sample selection, research design, time frame and specific training programs.

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After reviewing the abstract, only 20 papers were selected for an in-depth and comprehensive review. These papers were analyzed in detail considering the relevance and importance of search process criteria. In the final stage, 9 papers were selected as ideal for systematic review.



## RESULTS & DISCUSSION

### *Social Skill Training/Program Overview*

According to the 9 studies included, 4 social skill training programs applied in 5 papers have shown positive effects on social deficits of adolescents with ASD. These training programs are Kontakt, PEERS, Peer mediated intervention and Peer network intervention. These training programs aimed at improving the social communication and social interaction of adolescents with ASD were found effective.

Peer mediated intervention or Peer Network Intervention involves kids without disabilities to play and interact with children with disabilities. This intervention strategy has a positive impact on social skills of children and adolescents with disabilities (McConnell, 2002; Zhang & Wheeler, 2011). Studies indicate that peer mediated intervention is a very successful strategy for social skill learning with contribution in academics, personal and social development (Kamps et al., 2015; Rodríguez-Medina et al., 2016).

The Kontakt program is an evidence-based group training that combines the elements of cognitive behavior therapy, computer based cognitive training, behavior activation, psychoeducation, observational learning, for children and adolescents with ASD who have normative IQ range. This program was developed in Germany. The kontakt program improves social interaction and social communication, social motivation, awareness about self and others, problem solving skills, and self-confidence (Jonsson et al., 2019).

The kontakt program was applied in 2 literatures out of 9, as a social skill training for children and adolescents with ASD (Jonsson et al., 2019; Afsharnejad et al., 2021).

Program for the Educational and Enrichment of Relational Skills (PEERS) is a group based program that aims to improve the social skill impairments and relationship problems of adolescents with ASD. PEERS for adolescents is a structured curriculum in which ecological and valid social skills are taught like communicational skills, responding to bullying, resolving conflicts (Helder et al., 2024).

The remaining 4 studies designed their own custom social skill training programs to meet the requirements of their studies, tailored their program to meet the needs of their participants with ASD and other comorbidities.

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### ***Outcomes of Training/Program***

The social skills applied in the 9 literatures were found to be positive in improving social impairments and other areas of adolescents with ASD. 4 studies included structured programs while other 5 literature designed their own custom program ideas to study its effects on social problems.

The results of MacFarland & Fisher (2019)'s research show that combining video game-based group instructions with peer mediated intervention can have positive effects on generalization of the social skills across natural settings of adolescents with ASD and Intellectual Disability. The study suggests that multi-component intervention can improve social behavior of adolescents with ASD.

Jonsson et al. (2019) evaluated the extended 24 week version of social skill training program KONTAKT's effectiveness compared to standard care for children and adolescents with ASD. The study suggested that the 24 week extended social skill training program had significantly more impactful improvements than shorter social skill training programs, and not only post the treatment but were consistent after 3 months of the completion.

Kalyvezam et al. (2020) studied the effects of peer network individualized intervention in improving the social skills of 3 adolescents with ASD. The circle time program intervention was applied and it was found to be effective in improving various targeted areas of social skills and social behavior of all participants like initiation and response while interacting with peers, suggesting the effectiveness of the individualized peer network intervention.

While a custom social skill training program based on the cognitive model of social information processing was found to be useful for the social skills of adolescents with high-functioning autism (Mirzaei et al., 2020). The study indicated positive results in generalization and maintenance of social skills, including eye contact, recognition of social cues, problem solving abilities in social context, emotional manifestations of self and others and relating them to situations. After 12 sessions twice a week of 2 hours, parents and participants also gave their positive views and opinions about the program.

Behavior management and Social Skill Training can improve the behavioral and adaptive problems of adolescents with high functioning autism (Akrami et al., 2020). The study used a single case ABA design of 37 sessions to educate both adolescents and their mother, it was found effective in reducing behavioral problems and improving adaptive skills of adolescents with ASD, suggesting the effectiveness of the educational program for ASD.

Afsharnejad et al. (2021) compared the 16 session KONTAK program to the interactive group cooking program, Super Chef with the sample of 90 adolescents diagnosed with ASD. The study indicated both the program being effective in achieving social goals of participants, however KONTAK program was found more effective than Super Chef program in achieving social goals and reduction of social anxiety levels.

Pedersen et al. (2022) aimed to develop a virtual reality application as a technique for music therapy to improve social skills of adolescents with ASD. The study involved interviews with music therapists and pre-test with non-autistic children, indicating positive usability and social skill enhancement for the future possibilities of its effectiveness with adolescents with ASD.

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Ma et al. (2023) studied the effects of theory of mind social skills training program [an integration of Theory of Mind and Social Skill Training] on targeted social skills of three adolescents with ASD. The study proves that ToM-SS can be effective in improving ToM and targeted social skills of adolescents with ASD.

Khan et al. (2024) aimed to investigate the effectiveness of the UCLA PEERS in improving social skills of adolescents with ASD. Results show beneficial effects of the PEERS program in improving targeted social skills like social initiation, conflicts and social reciprocity of adolescents with ASD. Table 2 shows the results of social skill intervention used in the 9 studies.

**Table 2 Results of the studies included**

Study	Research design	Sample	Aim	Program	Results	Effects
MacFarland & Fisher (2019)	Experiment	Adolescents	Aimed to study the combined effects of peer mediated intervention and video-based group instruction on generalization of social skills of adolescents with ASD and Intellectual Disability.	Peer mediated intervention	Positive	All the participants showed an increase in the performance of social skills across different natural settings.
Jonsson et al. (2019)	Experiment	Children & Adolescents	Aimed to compare the 24 week extended version of KONTAKT program with the shorter social skill training program.	KONTAKT	Positive	Positive effects on social communication skill and other autistic traits were reported post-treatment and after 3 months.
Kalyvezam et al. (2020)	Experiment	Adolescents	Aimed to investigate the positive effects of individualized peer network intervention on social skills.	Circle time program	Positive	The program significantly improved the social skill and social behavior like initiation and response while interacting with peers.
Mirzaei et al. (2020)	Experiment	Adolescents	Aimed to develop a program based on a social information model for the improvement of social skill of adolescents with ASD.	Custom program based on social information model	Positive	The program showed improvements in generalization and maintenance of social skills like eye contact, emotional reciprocity and problem solving abilities.
Akrami et al. (2020)	Experiment	Adolescents	Studied the effects of behavior management and	Custom program was used after	Positive	The results showed significant reduction in behavioral

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Study	Research design	Sample	Aim	Program	Results	Effects
			social skill training on behavioral and adaptive problems.	reviewing various papers.		problems and increase in adaptive skills.
Afsharnejad et al. (2021)	Experiment	Adolescents	The study aimed to investigate the effectiveness of the KONTAKT program in improving social skills compared with the super chef program.	KONTAKT	Positive	Achievements in personally meaningful social goals and reduction in social anxiety were reported.
Pedersen et al. (2022)	Design and development study	Adolescents	Study aimed to develop virtual reality applications as a technique for music therapy to improve social skills.	Not specified	Positive	The study still was in the development phase and effects were not observed with adolescents with ASD. Pre-tested with non autistic children.
Ma et al. (2023)	Experiment	Adolescents	Studied theory of mind and social skill training integration	Theory of mind social skill training program	Positive	Social skills like praising others, expressing emotion and seeking help were reported.
Khan et al. (2024)	Experiment	Adolescents	Aimed to study the efficacy of the PEERS program in improving social skills.	PEERS	Positive	Overall improvement in socialization was reported with specific effects on social initiation, conflict and social reciprocity.

### CONCLUSION

This systematic review aims to prove that social skill training programs can effectively address the social communication and social interaction deficits of adolescents with ASD. This review includes 9 studies, and 5 studies applied 4 different social skill training programs.

These programs like Peer mediated intervention, Kontakt, Peer network intervention and Program for the Educational and Enrichment of Relational Skills (PEERS) have shown positive effects on social deficits of adolescents with ASD.

The remaining 4 studies designed their custom social skill training programs with different variables and theories like social information processing model, single case base ABA design, virtual reality and theory of mind to prove its efficacy in improving the social deficits. These custom programs also showed positive results in improving the social deficits.

### Limitation

This review is done only on 2 two online databases, google scholar and pubmed with the keywords “social skill training” & “autism”.

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### *Further Research*

Although these programs were very effective in improving the social skills of adolescents with ASD, there is a notable gap in research concerning programs specifically designed for adolescents with severe autism. Adolescents with severe autism are provided with early interventions like social communication and language therapy, occupation therapy, speech therapy and many other interventions but after reaching a certain age some of these interventions become non effective in improving any skills.

Further research should focus on developing effective training programs designed to improve the social skills of adolescents with severe autism and those who have low levels of IQ with ASD. Moreover, integrating these social skill training programs with other therapeutic techniques like behavior modification and Applied Behaviour Analysis can provide the understanding of combined effects on social skills training.

Furthermore, while peer mediated intervention involving neurotypical peers has been well researched and has proven the efficacy of improving social skills of adolescents with ASD, there is a need to further research involving socially trained peers with autism as the part of peer mediated intervention for other non-trained adolescents with ASD. Exploring how socially trained peers with autism can impact social skills of other adolescents with autism can reveal significant benefits and will modify the peer mediated intervention.

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### **Conflict of Interest**

The author(s) declared no conflict of interest.

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