

Critical Review: Effectiveness of Group-Based Interventions in Autism Spectrum Disorder

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Social communication deficit is a hallmark symptom of Autism Spectrum Disorder. Despite the rising prevalence of this disorder, and its associated social communication challenges, clinicians and researchers have not yet to identify best practice procedures for Speech-Language Pathology intervention. The current literature review analyzed existing research to determine the efficacy of group-based interventions targeting social communication deficits in school-aged children with Autism Spectrum Disorder. This literature search was conducted using an existing database and six articles were selected for inclusion. These articles were evaluated based on methodological robustness of findings, as determined by the validity, reliability, and relevance of results. Overall, this research suggests mixed efficacy of group-based intervention, with greater degrees of success observed in implicit and individualized treatment approaches. Further research is required to determine whether these approaches are universally beneficial when developing group-based treatment programs.

Introduction

Autism Spectrum Disorder (ASD) is a condition characterized by a marked impairment in social communication, resulting in reduced engagement in social interactions (American Psychiatric Association, 2013; Bauminger & Kasari, 2000). The rising prevalence of ASD in North America suggests a greater need to establish evidence-based treatment methods to address social communication deficits in this population (Fombonne, 2003). The existing literature has demonstrated that directly targeting social communication in therapy can positively alter the developmental trajectory of social communication skills in children with ASD (Gulsrud et al., 2014).

One method of directly targeting social communication is through group-based therapy. Group-based interventions exhibit diverse implementation strategies, ranging in the number of participants, frequency of interaction, interaction style and criteria for group membership. For example, several studies included in this review focus on groups composed solely of children with ASD (Mackay, Knott, & Dunlop, 2007), while others encourage the inclusion of neurotypical peers (Simpson, & Bui, 2016). Previous research has also examined the influence of interaction style, comparing the use of explicit and implicit intervention formats (Owens et al., 2008). Determining the efficacy of group-based interventions, therefore, requires a comparison of diverse treatment approaches.

Previous meta-analyses have established the effectiveness of group-based interventions in the treatment of social impairment for pre-school aged

children with ASD (Tachibana, 2018). The effectiveness of group-based interventions has also been identified in different populations with speech and language deficits, which further reinforces the efficacy of this approach. Research conducted with children diagnosed with Down Syndrome suggested that group-based interventions are particularly important for school-aged children given the increased need for social engagement as children grow (Prévost, 2002). Despite these findings, no review of the current literature has been done to confirm whether similar benefits exist when treating school-aged children with ASD.

Best practices for ASD intervention are particularly relevant for speech-language pathologists, who are uniquely qualified to deliver these social communication-based treatments, and therefore play a crucial role in providing intervention services for this population (American Speech-Language-Hearing Association, 2006). Further research must be done to guide speech-language pathology practices and establish whether group-based intervention approaches are beneficial when targeting social communication deficits in school-aged children with an ASD diagnosis.

Objectives

The objective of this review is to analyze existing literature pertaining to group-based, social communication intervention for school-aged children with Autism Spectrum Disorder. The secondary objective of this review is to compare existing group-based intervention approaches to determine which approaches are effective in treating social communication deficits.

Methods

Search Strategy

The articles included in this review were selected from a pre-established database provided by the Autism Spectrum and Language Disorders lab at Western University (Binns & Oram Cardy, pers. comm.). This database was created to identify effective, evidence-based intervention approaches for treating school-aged children with ASD. To be included in this database, research had to be conducted by a registered speech-language pathologist or speech-language pathology student and had to evaluate an intervention for children with ASD. The articles selected for the database were extracted from computerized databases including PsycINFO, Medline via Ovid, ERIC, CINHAL, and the Cochrane Central Register of Controlled Trials (CENTRAL). In total, the database was comprised of two hundred and fifty-one articles. Within this database, the following search terms were used: Social or Social Communication.

Selection Criteria

Only studies analyzing school-aged populations (ages six to twelve) and including at least one child with a formal diagnosis of ASD were analyzed in this review. Each study had to evaluate a group-based social communication intervention delivered by a registered speech-language pathologist, or speech-language pathology student. Studies in which a group format was used to test the generalizability of another intervention were excluded. Research regarding AAC devices only was also excluded.

Data Collection

The literature search based on the above criteria yielded six articles that were included for analysis. This consisted of three single-subject study designs (level 3 evidence), one within-subjects design (level 3 evidence), one randomized control trial (level 1 evidence) and one non-randomized clinical trial (level 2b evidence; Archibald, 2015).

Results

Single-subject design

Single-subject designs are useful for investigating rare disorders such as ASD, and can be completed with sufficient rigor (e.g., adequate sampling of behaviour before, during, and after intervention) to yield interpretable results. Generalization of findings from such studies warrants caution, given limited sample

sizes and the exclusion of control groups for comparison.

Tommy Mackay, Fiona Knott and Aline-Wendy Dunlop (2007) used a single-subject design to examine social communication group-based intervention in 38 children with a diagnosis of high functioning ASD. The intervention was implemented with a focus on perspective-taking, conversation, and social engagement. This treatment method was delivered to groups of seven or eight participants with an appropriate ratio of clinicians to participants of 1:2 in 1.5 hr weekly session over 12-16 weeks. Standardized parent questionnaires and follow up interviews were used as outcome measures to address social skills, social competence and overall perception of social communication success in group settings. Child ratings of social skills and social competence were also recorded. Results demonstrated significant positive changes in all four parent questionnaires post-intervention with nine families reporting improved conversational skills. Significant gains in self-perceived social skills and social competence in the children's ratings were also observed.

Strengths of this study include in-depth reporting of individualization procedures for this intervention, and clearly described methods and treatment implementation. Limitations include the reduced fidelity given the individualization of treatment, and the use of only qualitative outcome measures based on parent and child judgement.

Overall, this study provides somewhat suggestive evidence that group-based intervention can have a positive impact on social interactions in ASD, at least as perceived by parents and children.

Simpson & Bui (2016) used a single subject design to evaluate the effectiveness of a peer-mediated reading program involving 8 school-aged participants with Low Functioning Autism (LFA). These participants were grouped with three neurotypical peers and the 15-minute reading sessions were overseen by teachers and speech-language pathology students. Communication initiations and responses of participants with LFA and their peers were recorded as experimenter designed outcome measures. Results revealed no significant changes in the number of LFA participant initiations. However, typically developing peers demonstrated an overall increased number of initiations following participation in this intervention.

The strengths of this study include the rigorous training of data recorders to ensure inter-rater reliability. However, a limitation of this data collection method is

the exclusion of a second-rater for each group to further enhance reliability. Additional limitations include the study's small sample size and limited attempts to encourage generalization or report any objective data regarding social interactions outside intervention sessions.

Overall, this study provides somewhat suggestive evidence that group-based reading intervention does not increase the number of social initiations from children with LFA.

The final single-subject design article reviewed in this paper was conducted by **Guivarch et al. (2017)**. This study evaluated the effectiveness of a single implicit social skills training group, composed of 6 participants (9-10 years old) with ASD. Outcome measures were recorded using standardized rating scales of both social and emotional competence. Results demonstrated a statistically significant improvement in social skills following the intervention. Increased ease of participation in group activities was also reported, however, this finding was not supported with any quantifiable statistical analyses.

A relative strength of this study is the high feasibility of implementation, given small group sizes. Several limitations of this study exist, including limited reporting of intervention implementation, which makes replicability very challenging. The researchers also used parametric tests to conclude the efficacy of this treatment, which is not recommended given that data from this study is not normally distributed.

Overall, this study provides highly suggestive evidence that group-based implicit social skills training groups are an effective method for increasing emotional and social competence.

Within-subjects design

One study in this review used a within-subjects design to evaluate the effectiveness of group-therapy targeting social communication. This research design is appropriate for studies with a small sample size, and group performance outcomes are useful in evaluating intervention efficacy. Once again, the generalization of results is challenging given the exclusion of control group comparisons.

Beadle-Brown et al. (2018) conducted a single group study involving 22 children with ASD (ages 7-12 years old). This study evaluated the effectiveness of a well-described drama-based intervention for groups of 3-4 children; the intervention was facilitated by trained practitioners (4-5) weekly for 10 weeks. Outcome

measures included standardized ratings of social-communication and interaction skills with a particular interest in subscale scores of communication, creativity, and reciprocal social interaction. Observations regarding the feasibility of the intervention were recorded. Results revealed no significant differences for individuals or groups in social interaction. Qualitative results indicated the program was feasible for implementation in schools.

Strengths of the study were the inclusion of an appropriate sample size (based on pre-experimental testing) and the use of appropriate statistical analyses to inform clearly reported results. Limitations of the study include a lack of detail regarding intervention tasks, and repeated use of a standardized assessment tool in a short period of time.

Overall, this study provides suggestive evidence that group-based intervention does not impact social interaction in children with ASD.

Randomized control study design

The use of randomly assigned experimental and control groups in research allows authors to draw conclusions with a great degree of confidence. This study design is difficult to achieve with populations such as ASD given the large number of participants required to achieve appropriate statistical power. Although uncommon in ASD literature, when conducted appropriately, this study design yields compelling research results.

Koenig et al. (2010) used a randomized control study design to systematically compare the social communication skills of 44 participants who were either assigned to a weekly cooperative playgroup or control group. Each intervention group was composed of 5 participants and 2 peer tutors, and sessions were conducted for an hour and a half each week. Standardized parent questionnaires, global symptom impression scales, and general satisfaction surveys were used to measure outcomes related to social communication, social competence, and parental satisfaction with the program. Results demonstrated that a greater number of children in the treatment group (16/23) demonstrated significant improvements in social communication and global functioning post-intervention compared to the control group (1/23).

Perhaps the greatest strength of this study was the thorough explanation and replicability of intervention procedures. The authors of this research developed a manual that outlined the necessary components of treatment; this manual was then used to ensure standardization across treatment groups and to help guide treatment modifications required for individual

participants. Another strength was the researcher's use of pre-experimental testing to determine the number of participants required in each group to achieve appropriate statistical power. Finally, the authors report directly on the feasibility of implementation, which can be used in determining clinical relevance. One relative limitation of this paper was the lack of reported generalization measures.

Overall, this study is the first to provide highly compelling evidence that group-based intervention is an effective method of improving social skills for children with ASD.

Nonrandomized clinical trial

This design provides a suitable alternative for researchers in the field of ASD when practical considerations interfere with the implementation of a fully randomized control trial (Axelrod, & Hayward, 2006). The inclusion of a control group, although not fully randomized, yields a great degree of confidence in research results.

Owens et al. (2008) used a nonrandomized clinical trial approach to compare the social skills outcomes of 33 children with ASD who were assigned to a LEGO group intervention, a Social Use of Language intervention or the control group. Group size and intervention protocols varied between therapy procedures, with the LEGO group assigning 'roles' to each participant in a social interaction and Social Use of Language groups using explicit teaching methods to encourage social language use. Formal testing was used to measure two outcomes: the improvement of social interactions and the decrease of maladaptive behaviours. Generalizability of results was reported based on systematic observation of social behaviour outside the therapy setting.

Results revealed that although both treatments were effective in reducing maladaptive behaviours, the LEGO therapy had significantly greater reductions. Furthermore, the participants in the LEGO group demonstrated an increase in social interactions, which was not observed in the Social Use of Language group. Results regarding generalizability suggest that neither group demonstrated improved social interactions on the playground.

One strength of this article is the direct comparison of two different group-based therapies, which offered additional insight regarding specific intervention features which may contribute to improvement in outcome measures. The thorough documentation of both treatment methods and the inclusion of generalizability measures further contributes to the credibility of these

results. One significant limitation of this research was the lack of consideration for confounding variables when assigning treatment vs. control group participants. The parents were also made aware of which treatment group their child was in, and this may have biased results.

Overall, this research provides compelling evidence that implicit (as opposed to explicit) group treatment programs yield greater success when targeting a reduction in maladaptive behaviours for children with ASD. Further research is required to determine whether intervention techniques can be modified to improve the generalizability of these results outside the therapy room.

Discussion

This literature review examined the effectiveness of different group-based interventions to address social communication deficits in school-aged children with ASD. The varied methodological designs and intervention strategies in this review produced mixed findings. Several studies found that group-based interventions were not effective in targeting social communication challenges for children with ASD. These same studies also demonstrated various methodological limitations including small sample sizes, lack of control groups and poor reporting of intervention techniques and results. Other studies provided suggestive evidence that group-based interventions are beneficial in targeting social skill development. The most compelling evidence was compiled from two studies using a randomized control trial and nonrandomized control trial design to suggest that group-based interventions are effective in targeting social skills for children with ASD. These two studies had robust methodological designs, which increases the credibility of their findings.

When comparing effective vs. non-effective group-based interventions, two parameters of delivery were identified that may influence treatment success. First, several studies explore the efficacy of explicit training, implicit training or direct comparison of the two. Explicit training involves direct instruction of social skills, while implicit training encourages social participation through indirect methods. Guivarch et al. (2017) found the implicit treatment approach to be effective in addressing social communication deficits, while Owens et al. (2008) directly compared implicit and explicit teaching methods to reveal greater efficacy of the implicit approach. Two other studies describing conversation-based intervention (Mackay, Knott, & Dunlop, 2007) and cooperative play-group treatment (Koenig et al., 2010) respectively demonstrated

statistically significant improvement in social-communication based outcome measures. These approaches are considered implicit based on a lack of direct coaching, and a focus on joint participation in social activities.

Another factor that may contribute to treatment success is the use of individualized intervention techniques. Koenig et al. (2010) demonstrated highly compelling evidence to suggest that children who received tailored intervention (based on pre-established criteria) benefited significantly from group-based interventions. Mackay, Knott, & Dunlop (2007) also demonstrated the effectiveness of individualizing group therapy methods, but their lack of standardized treatment manual to establish inclusionary criteria reduced the fidelity of research results. Overall, findings suggest that treatment involving implicit training and individualized intervention is most successful in addressing the social communication needs of children with ASD.

Despite the identification of preliminary group-based intervention trends, the mixed results and methodological limitations of several studies suggest that further research is required. Future studies should evaluate specific attributes of group-based intervention to identify whether treatment approaches contribute to overall efficacy in addressing social communication concerns for children with ASD.

Clinical Implications

The current literature does not provide sufficiently compelling evidence to change practices in Speech-Language Pathology. Although several individual studies demonstrate the success of group-based intervention, lack of agreement within the literature suggests that further research is required. This review has revealed sufficient high-quality evidence to guide group-based intervention practices and encourage the inclusion of implicit teaching and individualized support within group-based treatment for school-aged children with ASD. Clinicians should continue to monitor their outcomes and determine whether these practices are feasible and successful within their intervention setting.

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