



AOTA Evidence Briefs

Autism Spectrum Disorder

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

Effectiveness of a Home Program Intervention for Young Children with Autism

Ozonoff, S., & Cathcart, K. (1998). Effectiveness of a home program intervention for young children with autism. *Journal of Autism and Developmental Disorders*, 28(1), 25–32.

Level II

Two groups, nonrandomized study

Why research this topic?

Research studies from the 1980s and 1990s demonstrated that interventions for children with **autism** (see *Glossary*) are effective when they (a) use structured behavioral and educational approaches, (b) train parents to implement the program at home, and (c) are initiated before age 5. One program that meets these criteria is TEACCH (Treatment and Education of Autistic and related Communication-handicapped Children). The aims of this program are parent education and parent empowerment. Previous studies of TEACCH have suggested positive outcomes, but most of these studies lacked rigor (e.g., lacked a **control group**) (see *Glossary*) and examined child behavior rather than cognitive function.

What did the researchers do?

The Level II cohort study participants were 22 children (18 boys and 4 girls). Eleven of the children were assigned to the TEACCH intervention group and 11 were assigned to the control group. The average age for the children was 53.3 months. The children in each group were matched for age, cognitive level, and severity of autism. The two groups were measured before and after the intervention using the Psychoeducational Profile–Revised (PEP-R). They also were initially assessed using the Childhood Autism Rating Scale (CARS). The PEP-R measures imitation, eye–hand coordination, perception, fine and gross motor skills, and nonverbal and verbal conceptual ability. The CARS rates the severity of autistic behaviors.

The intervention group was carefully assessed using additional measures to determine an individual intervention plan using TEACCH principles. This group then received a 10-week home program that was developed and guided by a therapist. Each program included structured teaching, visual cuing, a schedule to help the child transition from one activity to another, an

augmented communication system, and functional activities (e.g., prevocational, such as assembly and packaging). At the beginning of the 10 weeks, the therapists provided parents with extensive guidance and modeling; by the end of the 10 weeks, the therapists moved into a supportive role, giving the parent more responsibility for guiding the program's activities. The **control group** (see *Glossary*) received no home program; both groups regularly attended day treatment programs.

What did the researchers find?

The children in the intervention program improved more than the control group in imitation, fine and gross motor, and cognition. The children with higher initial performance demonstrated greater improvement. In particular, for children in the intervention group, cognitive verbal scores on the PEP-R were related to total change scores. Mild autism and good language skills predicted greater improvement from the home intervention. Age was not correlated with performance improvements.

What do the results mean?

These findings suggest that home programming using the TEACCH model is highly effective in improving cognitive and developmental skills in children with autism. This programming was meant to extend school-based services by offering training to parents to implement a home program with their children. Occupational therapists use many of the TEACCH principles and strategies. Like occupational therapy, TEACCH is a highly individualized approach that matches intervention to the child's developmental level. The intervention uses a structured approach, often accessing the child's visual skills and building on the child's interests and strengths. Performance expectations are clearly explained and guided by physically structuring the task and environment. This study found that the children who received the home programming scored two to three times higher than the control group across developmental areas. Children with mild autism and higher initial cognitive and language skills benefited most from the TEACCH intervention.

What were the study's strengths and limitations?

This study focused on training parents and working in the child's home. The strengths of this study were use of a control group as previous studies of TEACCH were single subject, and measurement of developmental skills across multiple domains. Limitations included the lack of parent assessment. Although the model was focused on training parents and home-based intervention, the researchers did not measure parent teaching skills or parent satisfaction. The children were not randomly assigned to groups and the evaluators were not **blinded** (see *Glossary*) to group assignment. Follow-up assessment was not reported and long-term effects need to be examined. A comparison of TEACCH to other interventions is needed.

Glossary

Autism—Autism Spectrum Disorder—Pervasive Developmental Disorders (PDD) is the diagnosis used in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.), text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000), and in the International Classification of Diseases (ICD-10; World Health Organization, 1993) to describe children with a cluster of symptoms that vary widely in type and severity. The symptoms are grouped into three broad categories: (a) qualitative impairment in social interaction; (b) communication disorders; and (c) stereotyped, repetitive patterns of behaviors or a restricted range of interests. Depending on the level and distribution of impairment across these categories, a child can be diagnosed with Autistic Disorder, Asperger syndrome, or Pervasive Developmental Disorder—Not Otherwise Specified (PDD—NOS). All three of these diagnoses are usually included under the umbrella term *autism spectrum disorders* (ASDs).

The Individuals with Disabilities Education Improvement Act of 2004 (IDEA, Pub. L. 108-446) also includes autism as a disability category under which children might be eligible for special education and related services. The IDEA regulations define *autism* as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction generally evident before age 3 that adversely affects a child’s educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences” (34 C.F.R., §300.7[c][1][i]).

Blinded/blinding—Blinding refers to the practice of keeping members of the research study unaware of which group a participant is assigned to (treatment or control) in the study. Single blinding usually refers to keeping study participants unaware of whether they are receiving the experimental or the sham treatment. Double blinding usually refers to keeping the participants and those who are administering the treatment unaware of who is receiving the experimental and who is receiving the sham treatments. In some cases, where it is impossible to blind those administering treatment, the individuals who are administering the outcome measures can be blinded to group status.

Studies in which blinding does not occur can have significant biases. When the participants know that they are receiving the experimental treatment, they often get better because they think they ought to (this is often referred to as the placebo effect). When researchers know that a participant is receiving the experimental treatment, they often subconsciously favor those participants when evaluating them on outcome measures. For instance, when timing a participant in the treatment group, researchers may unknowingly stop the watch a little faster or slower so the treatment participant seems to do better.

Control group—A group that received special attention similar to that which the treatment group received, but did not receive the treatment.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.—Text Revision). Washington, DC: Author.
- Individuals with Disabilities Education Improvement Act (IDEA) of 2004. Public Law 108-446, 20 U.S.C.
- World Health Organization. (1993). *International classification of diseases: Diagnostic criteria for research* (10th ed.). Geneva, Switzerland: World Health Organization.

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For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.



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