



DARS Autism Program Report

Evidence-Based Treatment Approaches for Autism Spectrum Disorders:
A Review of the Literature and Recommendations

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Prepared for:

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None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

April 2014

Introduction

- **Autism Spectrum Disorders (ASD)**

A group of complex and lifelong neurodevelopmental disorders that are characterized by varying degrees of pertinent deficits in two areas: social communication and repetitive or restricted behaviors

- **Need for Effective Treatments**

- Dramatic rise in the number of individuals diagnosed with ASD
- Multitude of treatments established; however, many lack empirical support in terms of effectiveness
- Emphasis on evidence based practices has emerged and is a critical standard for the treatment of ASD

- **DARS Autism Program**

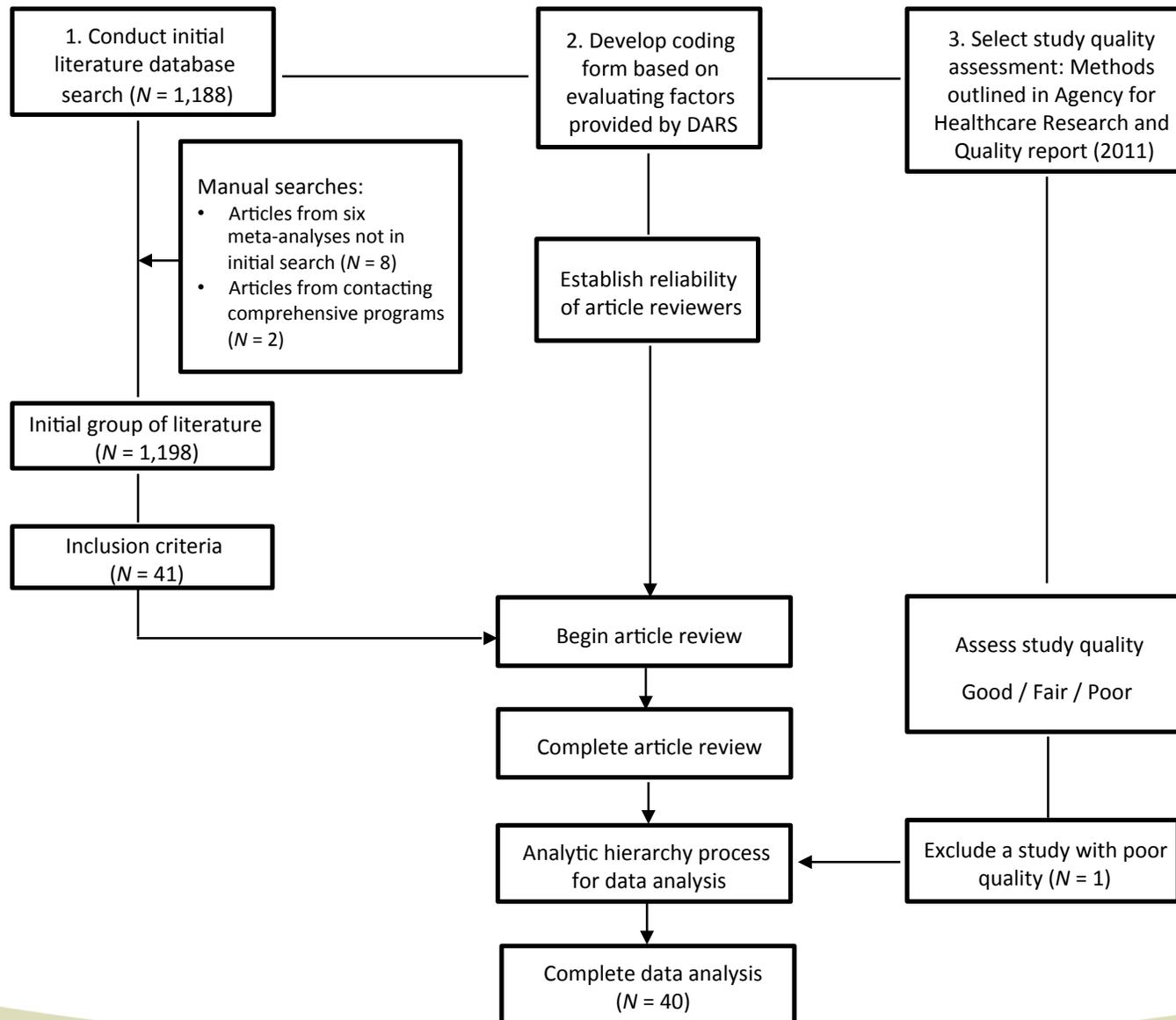
DARS has commissioned The Meadows Center for Preventing Educational Risk (MCPER) to complete:

- Synthesis of the literature
- Summary of recommendations
- Program evaluations

Purpose of the Literature Review

- To identify the necessary components for effective early intervention programs for children with ASD who are younger than 10 and how these treatments should be conducted
- **Key Questions**
 - How effective are the comprehensive programs?
 - What components of treatment programs are related to effective outcomes?
 - What characteristics of treatment service delivery are related to effective outcomes?
 - What specific characteristics of children and families are related to effective outcomes?
 - What are the best practices for inclusion of treatment services in an educational setting?
 - What are the funding options for treatment services?
 - What evidence supports long-term outcomes that verify positive changes in developmental trajectory?

Process of Literature Review



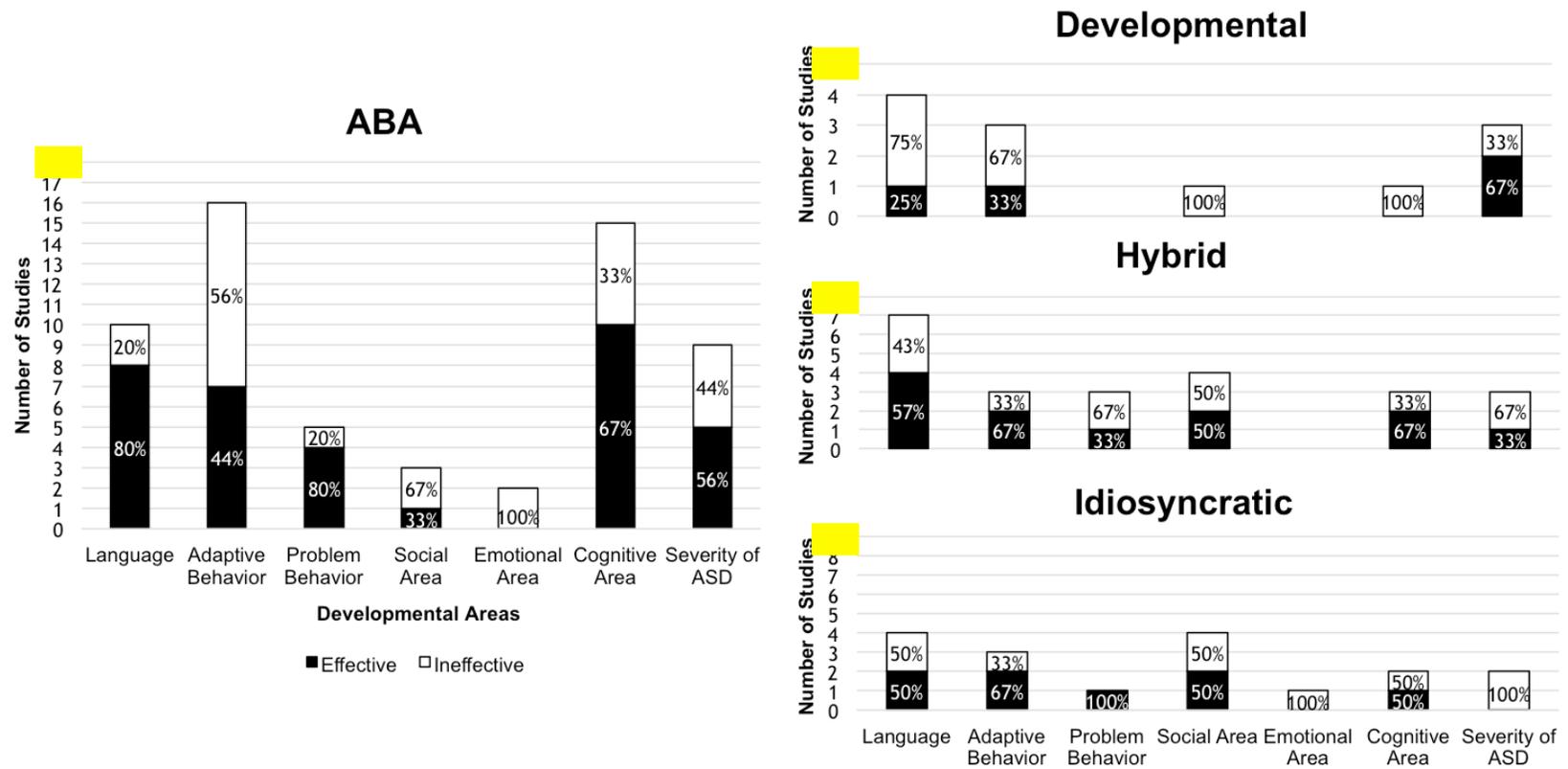
Theoretical Model

Model	Program Name	Definition
ABA Model	<ul style="list-style-type: none"> • Lovaas-model approach • Early Intensive Behavioral Intervention (EIBI) • Intensive behavior analytic based on Lovaas model 	Behavioral-oriented approach based on ABA principles and strategies, such as reinforcement, shaping, chaining, prompting, modeling, fading, discrimination learning, and task analysis using teaching formats such as discrete trial teaching (DTT)
Developmental Model	<ul style="list-style-type: none"> • DIR/Floortime • Focused Playtime Intervention (FPI) • Hanen’s More Than Words (HMTW) • Scottish Early Intervention Program • Social Communication Intervention 	Developmental oriented approach based on cognitive development theory and interpersonal development via social communication, social interactions, or play process
Hybrid Model	<ul style="list-style-type: none"> • Early Start Denver Model (ESDM) • Learning Experiences and Alternative Program for preschoolers and their parents (LEAP) • Barnet Early Autism Model (BEAM) • Joint Attention Symbolic Play Engagement and Regulation (JASPER) • Intervention for Interpersonal Synchrony (IS) 	Both behavioral and developmental oriented approach that influences intervention goals, procedures, and evaluation—for example, using behavioral analytic teaching strategies (e.g., reinforcement, shaping, chaining, prompting, modeling) based on developmental oriented goals and curriculum within a mix of teaching formats and methods such as DTT (clinician-led) and naturalistic teaching (child-led)
Idiosyncratic Model	<ul style="list-style-type: none"> • Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) • Keyhole Intervention Program • Treatment, Research, and Education for Autism and Developmental Disorders (TRE-ADD) • Management Intervention for Problem Behavior 	Use of varied approaches that are difficult to classify as one of the three theoretical models above—for example, TEACCH is based on several approaches, such as social learning theory, developmental, and the behavioral approach (Odom et al., 2010)

Key Findings

K 1 Effectiveness of Comprehensive Programs

Of the four theoretical models, the evidence supports the ABA-based model in terms of positive effectiveness across the largest number of developmental domains.



KQ 2. Components of Comprehensive Treatment Programs

- **Intervention Strategies**

Effective ABA-based programs used strategies that are behavior analytic in nature (e.g., shaping, prompting, prompt fading, discrimination training, task analysis, discrete trial teaching).

- **Child Development**

ABA-based programs reference considering child development through the use of individualized programs based on the child's strengths and weaknesses.

- **Manuals**

ABA-based programs reported use of a manual that prescribed how to implement the treatment protocol.

- **Parents' Roles and Involvement**

ABA-based programs reported parent involvement ranging from attending informational sessions on autism, providing input for goal setting, working alongside the therapists as a type of parent training, and/or attending regular progress meetings.

KQ3. Characteristics of Treatment Service Delivery

- **Intensity of Treatment**

Averaged approximately 29 hours (range 18.4 to 40) per week

- **Duration of Treatment**

Averaged approximately 20 months of intervention (range 9 to 48)

- **Qualifications of Service Providers**

- Therapists' backgrounds were diverse.
- Training and supervision were more crucial than therapists' qualifications.
- Supervisors should have extensive training and experience in treating children with ASD.
 - Senior therapists with at least 1,500 hours or 2 years of experience and/or clinicians with college degrees
 - Competency in treatment program development and implementation
 - Board Certified Behavior Analyst (BCBA) or a director of the clinic

KQ3. Characteristics of Treatment Service Delivery

- **Activities Related to Training Therapist**

Activities of training were variable: apprenticeship format, theoretical workshop, treatment observations, role-play with supervisors, one-to-one training and feedback, etc.
- **Supervision Activities**
 - One of the supervision activities was conducted during the regular (weekly or biweekly) progress-monitoring meetings, which lasted 1 to 2 hours and included the therapists, supervisors, and parents. Program data were reviewed, goals adjusted, mastery criterion set for new skills, and therapists were trained, if needed.
 - Both positive and critical feedback on the therapist's abilities to implement strategies and collect ongoing data were provided.
- **Multidisciplinary, Consultative, or Collaborative Approaches**

Reviewed evidence related to using multidisciplinary, consultative, or collaborative service delivery approaches is not strong.

KQ4. Specific Characteristics of Children and Families

- **Family Characteristics**

ABA-based studies did not report race, ethnicity, or socioeconomic status (developmental-, hybrid-, and idiosyncratic-based studies also did not report race, ethnicity, or socioeconomic status)

- **Child Characteristics**

- Children with a diagnosis of autistic disorder or PDD-NOS and no other major medical conditions
- Average starting age 40.1 to 49.1 months (range 22 to 84)
- Existing evidence not sufficient to draw firm conclusions regarding child characteristics that are linked to more effective outcomes

KQ 5. Best Practices for Inclusion of Treatment Service in an Educational Setting

- Average hours: 23 (range 15 to 37) per week
- Average duration: 18 months (range 12 to 36)
- Average age at start: 4 years old (range 3 years 11 months to 7 years 4 months)
- Treatment providers were trained therapists, teachers, and educational paraprofessionals.
- Training and supervising therapists was more important than the therapists' background.
- Supervisors need appropriate qualifications to train the therapists. The recommended qualifications are master's degrees in psychology or special education, becoming BCBAs or highly skilled ABA therapists.
- Programs should use a treatment protocol or manuals.
- Consultants or a multidisciplinary service model is recommended for inclusion of treatment services at school.
- Parents' active involvement was recommended to promote generalization of obtained skills into natural environments.

KQ 6. Funding Options for Treatment Services

- Four of 13 studies reported funding sources from the United States.
- Reported funding sources were public agencies, research grants, and a mixture of a medical assistance program and research grants.
- According to the studies' reports, none of the programs shared the cost of the treatment services with families.

KQ 7. Evidence of Long-Term Outcomes That Verify Positive Changes in Developmental Trajectory

- Positive outcome produced by early intensive programs was maintained up to 5 or 6 years after the post treatment evaluation.
- Follow-up studies 5 to 6 years later demonstrated that the control group, which received no program or different programs (e.g., less intensive treatment), showed significantly different outcomes from the treatment group. The results imply that if the participant does not receive the intensive programs at an early age (3 to 4 years old) he or she might not make the same level of improvement in development trajectory after 5 or 6 years. The follow-up results may support that early intensive programs contribute to positive changes in later developmental trajectories.
- It is too soon to conclude that early intensive programs such as ABA-home programs produce positive changes in later developmental trajectories because the strength of the evidence is insufficient.

Recommendations

- **Evidence-Based Effective Treatment Modality:
ABA-Based Model**

Although there were some positive outcomes with other theoretical models, the evidence is not sufficient to recommend a change in model from the current DARS autism program.

- **Treatment Intensity and Duration**

- At least 14 hours of treatment per week:
Higher levels of intensity (e.g., 20 to 30 hours per week) when duration of treatment is anticipated to be relatively shorter and/or when severity of diagnosis is deemed relatively higher
- Treatment period of at least 9 months:
Longer duration (e.g., approximately 2 years) when intensity of treatment is relatively lower and based on individual needs, as evidenced by ongoing progress monitoring

Recommendations

- **Service Provider Qualifications**

- Training and supervision was a more crucial component than therapists' qualifications.
- Minimum supervisor qualification should be a BCBA credential with experience working with children with ASD.

- **Consistent Treatment Implementation**

- Formalized training (e.g., didactic instruction, readings, in-situ training)
- Regular supervision (i.e., weekly or biweekly, 1–2 hours per week)
- Use of a manual or common protocol
- Ongoing fidelity evaluation

Recommendations

- **Parent Involvement**

- Parent input should be solicited during the planning stages to help individualize the child's treatment program.
- To encourage parent involvement, formal workshops on basic behavioral principles, teaching strategies, behavior management strategies, and information pertaining to ASD should be offered.

- **Service Delivery Approach**

- Use of ongoing feedback and supervision between a trained supervisor and therapist or parent
- Use of multidisciplinary (transdisciplinary) and consultative service delivery approaches in which professionals from different disciplines work together

Recommendations

- **Characteristics of Children and Families**

- Treatments should begin as early as reasonably possible (e.g., approximately 36 months of age) but by at least 80 months of age, as dictated by the identification of ASD.
- Existing evidence is not sufficient to identify relations between diagnosis and severity of autism and more effective outcomes.
- Assessment and treatment practices should be individualized with a focus on deficits and skills pertaining to the core characteristics of the ASD diagnosis for the purpose of program treatment planning.
- Existing evidence related to family characteristics is not sufficient to identify the characteristics linked to more effective outcomes.

Recommendations

- **Review of Child's Progress**

Determinations about continued services, modification of the programs, and future plans should be discussed within the context of progress (or lack thereof), as evidenced in the regularly reviewed data.

- **Significance of Child Development**

Use an individualized program referring to typical child development sequences.

Recommendations

- **Benefits and Risks of Implementation**

- Highly intensive ABA programs can be effective for children with severe difficulties in intellectual, educational, and adaptive behavioral functioning.
- There was only one ABA-based longitudinal study. The strength of evidence is insufficient to draw firm conclusions about which early ABA programs produce positive changes in later developmental trajectories.
- No identified evidence suggests risks for children from the implementation of ABA-based programs.

Evidence-Based Effective Alternative Treatment Modality

ABA-Based Focused Treatment

- Treatment uses empirically supported techniques and procedures that have been demonstrated to decrease behaviors of excess (e.g., problem behavior) and/or improve behavior deficits (e.g., language and communication, self-help skills, social skills).
- Targets prioritize specific behaviors of concern (e.g., problem behavior) and specific skill deficits (e.g., language and communication, self-help skills, social skills), rather than broad-based functioning across general domains.
- Treatment can be conducive to a variety of service delivery modalities, including consultation following initial assessment and treatment evaluations and relatively short, intense treatment implementation; approaches that emphasize care provider (e.g., parents, teachers) training and ongoing support, teaching, and feedback regarding assessment and intervention procedures; and other relatively novel delivery methods, such as telehealth and online communication systems (e.g., Skype, FaceTime).

ABA-Based Focused Treatment Techniques

- To summarize empirically supported behavioral techniques and procedures, we examined studies in which systematic reviews of the behavioral literature were conducted pertaining to treatments for one (or more) of the core or secondary areas of ASD.
- **Literature Search Process**
 - Electronic literature searches used the following databases: Academic Search Complete, Education Full Text, ERIC, PsycINFO, Psychology and Behavioral Sciences Collection, and via EBSCOhost Research Databases Service at The University of Texas Libraries.
 - Search terms were as follows: “autis*,” “social skills,” “adaptive behavior,” “challenging behavior,” “repetitive behavior,” “communication” or “language,” and “review.”
 - The three latest literature review studies in each target area (i.e., language and communication, social skills, challenging behavior, and adaptive behavior) between 2009 and 2014 were selected.

Strategies Used in ABA-Based Focused Treatments

Language and Communication	Social Skills	Challenging Behavior	Adaptive Behavior
<ul style="list-style-type: none"> ▪ Functional Communication Training (FCT) ▪ Augmentative and Alternative Communication (AAC) ▪ Modeling/video modeling ▪ Time delay ▪ Reinforcement ▪ Prompting 	<ul style="list-style-type: none"> ▪ Video modeling Social script an script fading procedures ▪ Self-management ▪ Peer-mediated intervention ▪ Positive reinforcement Prompting 	<ul style="list-style-type: none"> ▪ Functional Analysis (FA) and Functional Behavior Assessment (FBA) ▪ Response interruption and redirection ▪ Response cost ▪ Skill enrichment strategies ▪ Differential reinforcement ▪ Functional Communication Training (FCT) ▪ Noncontingent reinforcement (NCR) ▪ Extinction ▪ Interspersed requests 	<ul style="list-style-type: none"> ▪ Modeling/video modeling ▪ Task analysis and chaining ▪ Graduated guidance ▪ Response interruption and redirection ▪ Self-management ▪ Positive reinforcement ▪ Prompting

