

Caregiver Training as a Scalable Model for Improving Early Intervention Outcomes among Autistic Children

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Abstract: Early intervention can improve communication, adaptive functioning, and participation among autistic children, yet many families experience long diagnostic delays, limited specialist access, transportation barriers, and culturally mismatched services. This paper argues that caregiver training is one of the most scalable and equity-oriented models for improving early intervention outcomes because it moves evidence-based strategies from clinic-only delivery into daily routines where young children spend most of their time. Drawing on developmental, behavioral, family-centered, and implementation science frameworks, the paper synthesizes evidence on parent-mediated and caregiver-mediated interventions, identifies mechanisms through which coaching changes child and family outcomes, and proposes a practical model for implementation in low-resource communities. The central argument is not that caregiver training should replace professional services, but that it should become a core service layer that expands reach, improves continuity, and strengthens generalization. The paper concludes with policy, practice, and research recommendations for building sustainable caregiver training systems through primary care, early intervention programs, schools, telehealth, and community organizations.

Keywords: Autism Spectrum Disorder; Caregiver Training; Early Intervention; Parent-Mediated Intervention; Implementation Science; Underserved Communities.

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I. INTRODUCTION

Autism spectrum disorder (ASD) is increasingly recognized across racial, ethnic, and socioeconomic groups, with recent U.S. surveillance identifying ASD among approximately one in thirty-one 8-year-old children (Centers for Disease Control and Prevention [CDC], 2025). As identification increases, the public health challenge is no longer only whether autism can be detected, but whether families can access timely, individualized, and developmentally appropriate support after concern is raised. The American Academy of Pediatrics emphasizes early identification and management because children and families often require behavioral, developmental, educational, and health services that must be coordinated across systems (American Academy of Pediatrics, 2020).

In practice, many families do not receive intensive professional services during the period when developmental

plasticity is greatest. Waitlists, workforce shortages, high out-of-pocket costs, rural residence, language barriers, and service fragmentation can delay intervention for months or years. These barriers are particularly harmful for toddlers and preschool-age children, because early social communication, play, imitation, and adaptive routines provide the foundation for later learning. Caregiver training offers a scalable response: instead of depending exclusively on clinic-based professional hours, trained providers coach caregivers to embed evidence-based strategies into daily interactions.

This paper advances the thesis that caregiver training should be treated as a core early-intervention model rather than an optional add-on. Caregivers are not substitutes for clinicians; rather, they are the most consistent partners in the child's learning environment. When caregivers receive structured coaching, modeling, practice, feedback, and problem-solving support, intervention opportunities multiply across ordinary routines such as mealtime, bathing, dressing, play, reading, and

transitions. The result is a model with strong potential for scalability, generalization, family empowerment, and cultural adaptation.

II. CONCEPTUAL FRAMEWORK

A scalable caregiver-training model rests on four connected assumptions. First, children learn through repeated, meaningful interactions with familiar people. Second, caregivers can learn practical strategies when training is behaviorally specific, culturally respectful, and supported by feedback. Third, intervention effects are more likely to generalize when strategies are practiced in natural contexts rather than confined to therapy rooms. Fourth, service systems can extend reach by using stepped-care models in which all families receive

foundational coaching, while children with greater needs receive additional intensity from specialized providers.

Developmental and behavioral approaches converge on the importance of responsive interaction. Naturalistic developmental behavioral interventions teach adults to follow the child’s lead, create communication opportunities, reinforce attempts, model language, and build shared engagement. Caregiver-mediated approaches such as Project ImPACT, PACT, ESDM-informed coaching, and the WHO Caregiver Skills Training program translate these strategies into teachable routines. The mechanism is cumulative: small changes in adult responsiveness and environmental arrangement create more learning opportunities, which can increase child communication, engagement, imitation, and adaptive participation over time.

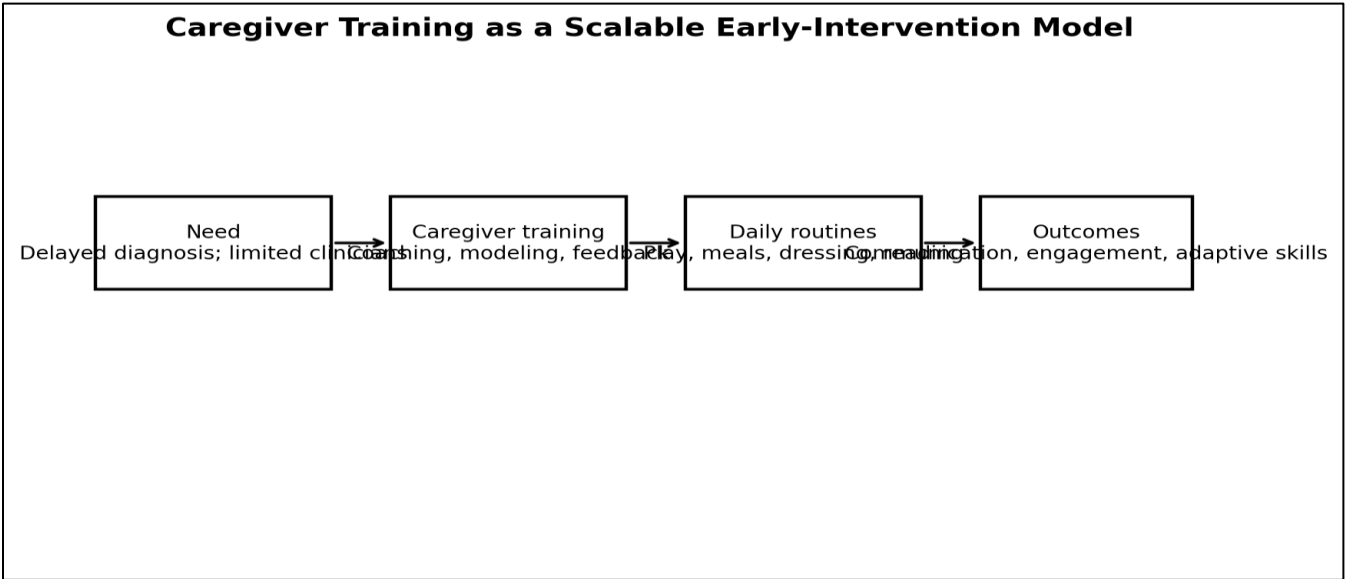


Fig 1. Logic Model for Caregiver Training as a Scalable Early-Intervention Pathway.

Table 1. Core Components of a Scalable Caregiver-Training Model

Component	Purpose	Practice Example	Equity Consideration
Assessment of routines	Identify family priorities and daily learning opportunities	Map play, meals, sleep, hygiene, and transitions	Begin with family-defined goals, not provider assumptions
Modeling	Show the caregiver what the strategy looks like	Provider demonstrates prompting communication during play	Use culturally familiar materials and interaction styles
Guided practice	Build caregiver fluency	Caregiver practices while provider observes	Normalize mistakes and use strengths-based feedback
Performance feedback	Improve strategy quality	Provider praises accurate steps and corrects one target at a time	Offer feedback in the caregiver’s preferred language
Generalization planning	Support use across settings	Apply the same strategy during meals and outdoor play	Adapt plans to housing, schedule, and transportation realities

Note. The table presents practical elements that can be adapted for home, clinic, school, or telehealth delivery.

➤ Evidence Base and Mechanisms of Impact

The evidence base for caregiver-mediated intervention has grown substantially over the past two decades. Randomized trials and long-term follow-up studies suggest that parent-

mediated approaches can improve caregiver responsiveness, child social communication, and dyadic engagement, although effects vary by child profile, caregiver stress, dosage, and implementation quality (Kasari et al., 2010; Pickles et al.,

2016). The Early Start Denver Model trial demonstrated that early developmental-behavioral intervention can improve developmental outcomes when delivered with intensity and fidelity (Dawson et al., 2010). Caregiver training extends this logic by increasing intervention opportunities beyond scheduled sessions.

The WHO Caregiver Skills Training program is especially relevant for low-resource settings because it was designed for families of children with developmental delays or disorders and emphasizes everyday play and home activities. WHO describes the program as consisting of nine group sessions and three individual home visits, with content addressing communication, engagement, daily living skills, challenging behavior, and caregiver coping. Its structure makes it suitable

for adaptation through community health workers, early childhood programs, and hybrid delivery models (World Health Organization, 2024; Salomone et al., 2019).

Three mechanisms explain why caregiver training can improve early intervention outcomes. The first is intensity through routines: a child may receive only a few weekly professional sessions, but daily routines provide dozens of learning opportunities. The second is generalization: skills practiced with familiar people in natural environments are more likely to transfer to real life. The third is caregiver agency: when caregivers understand why and how strategies work, they become active decision-makers rather than passive recipients of expert advice.

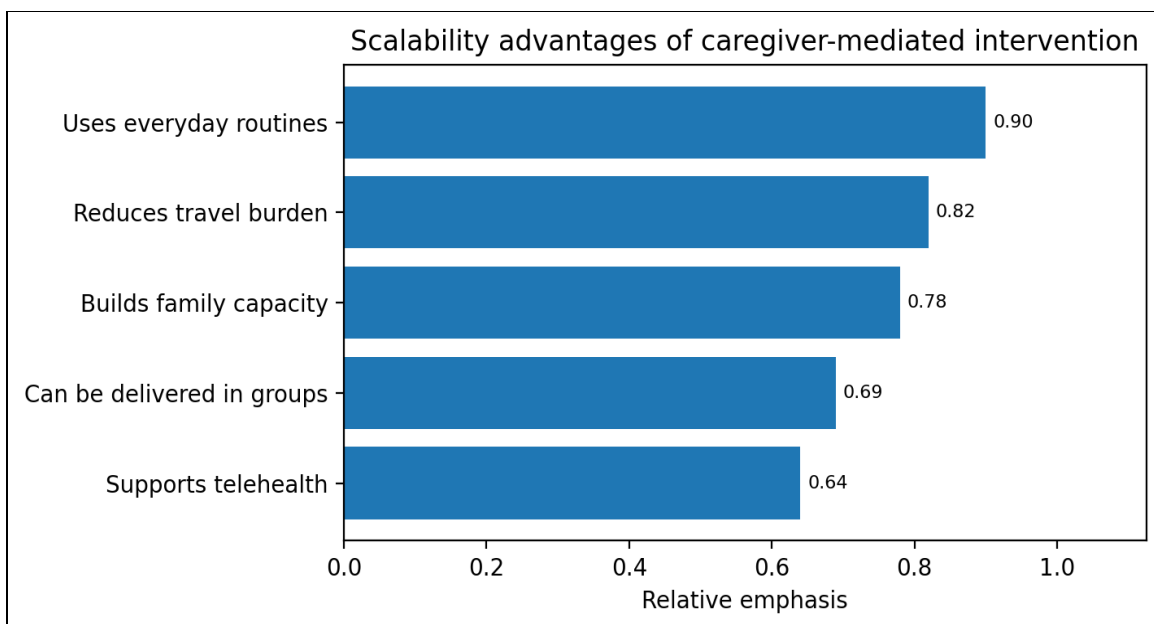


Fig 2. Main Scalability Advantages of Caregiver-Mediated Intervention.

Table 2. Mechanisms Linking Caregiver Training to Outcomes

Mechanism	Immediate Change	Expected Child Outcome	Expected Family Outcome
Responsive interaction	More following, imitation, and contingent response	Improved joint engagement and social communication	Greater caregiver confidence
Communication opportunities	More choices, pauses, and prompts during routines	More spontaneous requesting and commenting	Less frustration during daily activities
Behavior support	Clear routines, antecedent supports, reinforcement	Reduced challenging behavior and better transitions	Reduced stress and improved predictability
Coaching and feedback	Caregiver practices skills with support	Greater intervention consistency	Stronger partnership with providers

Note. Mechanisms are most effective when coaching is individualized and repeated over time.

➤ Implementation Model for Underserved Communities

A practical implementation model should use a tiered structure. Tier 1 provides universal caregiver education after developmental concern or diagnosis. Tier 2 offers structured group-based coaching for families whose children need more

support. Tier 3 adds individualized coaching, telehealth consultation, or specialist referral for children with complex communication, behavioral, or medical needs. This stepped model prevents the common problem of making families wait for specialized therapy before receiving any meaningful support.

Delivery can occur through early intervention agencies, pediatric clinics, Head Start programs, schools, faith-based organizations, community centers, and telehealth platforms. In low-resource settings, the most important design principle is not technological sophistication but reliability. Families need clear scheduling, accessible language, low-cost materials, childcare support for siblings when possible, and flexible make-up options. Telehealth can reduce transportation barriers, but it should be offered alongside phone-based and in-person alternatives for families with limited broadband or privacy at home.

Workforce design is also central. Professionals should train paraprofessionals, community health workers, teachers, and family navigators to deliver manualized caregiver-training components under supervision. This approach preserves quality while expanding reach. Fidelity tools should focus on observable coaching behaviors, including goal setting, modeling, caregiver practice, feedback, and planning for next steps.

Table 3. Tiered Caregiver-Training Implementation Plan

Tier	Target Families	Delivery Mode	Provider Role	Outcome Metric
Tier 1: Foundational education	All families after concern or diagnosis	Brief sessions, videos, printed guides	Explain autism, routines, and early strategies	Attendance and caregiver knowledge
Tier 2: Group coaching	Families needing structured skill building	Weekly groups plus practice assignments	Teach and rehearse core strategies	Caregiver strategy use and confidence
Tier 3: Individual coaching	Children with complex needs or limited progress	Home, clinic, school, or telehealth coaching	Individualize goals and troubleshoot barriers	Child communication and behavior change
Maintenance	Families completing active coaching	Monthly check-ins and booster sessions	Support generalization and prevent dropout	Service continuity and family satisfaction

Note. Tiered delivery improves reach while reserving specialist intensity for families with the greatest need.

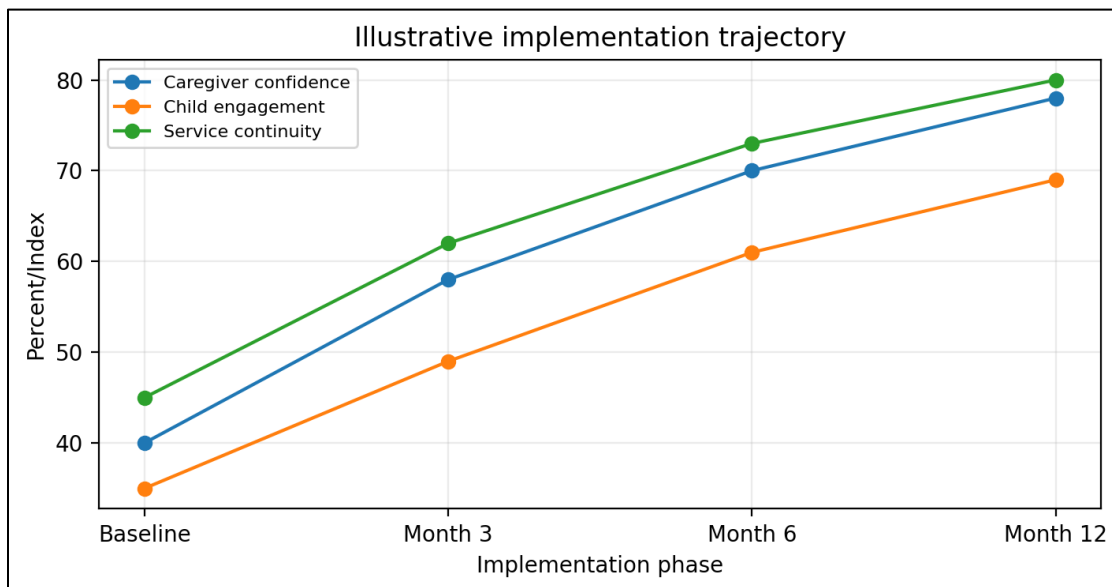


Fig 3. Illustrative Trajectory of Caregiver Confidence, Child Engagement, and Service Continuity After Implementation.

➤ Policy and Practice Recommendations

Policy should recognize caregiver training as reimbursable early-intervention work, not merely informal family education. Medicaid, private insurance, and early intervention systems should reimburse structured caregiver coaching, group training, telehealth coaching, and interpreter-supported sessions. Payment rules should allow services before a lengthy diagnostic process is complete when developmental

risk is evident, because waiting for formal diagnosis can delay learning opportunities.

Practice guidelines should require culturally responsive coaching. This includes using the family's preferred language, respecting caregiving values, adapting examples to household routines, and avoiding blame when structural barriers limit participation. Programs should measure both child outcomes and caregiver outcomes, including confidence, stress,

satisfaction, and perceived usefulness. For underserved communities, implementation success should be judged not only by average improvement but also by whether the model reduces disparities in access and continuity.

Research should move beyond efficacy trials in highly resourced clinics. Future studies should compare delivery

models, examine cost-effectiveness, test hybrid in-person and telehealth formats, and identify which families benefit most from group versus individualized coaching. Studies should also report subgroup outcomes by race, language, rurality, income, and caregiver education to ensure that scalability does not come at the expense of equity.

Table 4. Evaluation Indicators for Caregiver-Training Programs

Domain	Indicator	Data Source	Use for Improvement
Reach	Percentage of eligible families enrolled	Program records	Identify referral gaps
Fidelity	Provider use of coaching steps	Observation checklist	Target supervision
Caregiver outcome	Confidence and stress scores	Brief survey	Adjust support intensity
Child outcome	Communication, engagement, adaptive routines	Direct observation and caregiver report	Track developmental progress
Equity	Participation by language, rurality, insurance, and income	Administrative data	Detect disparity in access or completion

Note. Evaluation should be simple enough for routine practice but strong enough to guide quality improvement.

III. CONCLUSION

Caregiver training is a scalable, evidence-informed, and equity-oriented model for improving early intervention outcomes among autistic children. Its strength lies in transforming everyday routines into learning opportunities while building caregiver confidence and service continuity. To realize this potential, systems must fund caregiver coaching, train providers in culturally responsive methods, use tiered implementation models, and evaluate both child and family outcomes. When implemented with fidelity and respect for family context, caregiver training can help bridge the gap between evidence-based autism intervention and the everyday realities of underserved communities.

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