



# Telehealth Training in Principles of Applied Behavior Analysis for Caregivers of Young Children with Autism Spectrum Disorders during the COVID-19 Pandemic

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**Abstract** Following the outbreak of the COVID-19 pandemic, the U.S. government declared a state of emergency and many applied behavior analysis clinics temporarily closed. The current study described a pilot of an existing manualized caregiver behavior skills training, the Online and Applied System of Intervention Skills (OASIS), to promote telehealth caregiver training during the pandemic and facilitate the start of early intervention for families on waitlists. The OASIS telehealth curriculum trains caregivers to use applied behavior analysis with their children with autism spectrum disorder. Pre/post measures suggest that OASIS modestly improved parent knowledge, improved perceived quality of life, decreased stress, improved caregiver self-efficacy, and was viewed positively by participating families.

**Keywords** autism spectrum disorder · parent training · telehealth · behavior skills training · applied behavior analysis

Applied behavior analysis (ABA) is the evidence-based practice most often recommended to reduce problem behavior and teach replacement behaviors for children with autism spectrum disorder (ASD; Centers for Disease

Control and Prevention, 2018). Part of ABA service delivery is caregiver training to improve generalization and maintenance of skills. Caregiver training is not only crucial for child program fidelity but also because parents of children with ASD consistently report higher stress levels and lower levels of self-efficacy in child-rearing than caregivers of typically developing children (Baker-Ericzén et al., 2005). Behavior skills training (BST) as a method for caregiver training has demonstrated significant improvements in caregiver skills (Sun, 2020).

Not all children with ASD have access to ABA services, and their parents do not have access to caregiver training. This may be due to the vast gap in the supply and demand of ABA services in the United States, with one BCBA to every 604 individuals with ASD in the United States (Dietz et al., 2020). Finding services becomes more challenging in rural areas, where only 59.6% of families receive in-home support compared to 82.2% in nonrural settings (Mello et al., 2016). The COVID-19 pandemic exacerbated this need when in-person delivery temporarily halted, and services delivered via telehealth began to help address this gap.

In 2020, the U.S. government declared a state of emergency, and most behavior analysis clinics temporarily closed. Behavior analysts and other medical professionals quickly adapted video conference platforms to deliver services through telehealth (Crockett et al., 2020; Zoder-Martell et al., 2020). Since March 2020, telehealth services for mental health visits have increased from 1% to 41% of visits (Busch et al., 2021). Moreover, caregivers trained through telehealth have

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had comparable outcomes to those receiving in-person training; telehealth delivery was more cost-effective and more convenient for some families (Xie et al., 2013).

The Online and Applied System of Intervention Skills (OASIS) is a manualized caregiver behavior skills training, delivered via telehealth, to teach caregivers how to use ABA techniques with children with ASD (Heitzman-Powell et al., 2013). This hybrid online training consists of 16 learning modules and telehealth coaching sessions to train parents in rural areas to use ABA practices (Heitzman-Powell et al., 2013). OASIS learning modules cover the following topics: introduction to autism, introduction to ABA, defining and observing behavior, collecting data and graphing, reinforcement strategies, stimulus control, prompting, teaching strategies, antecedent control, behavioral function, use of extinction, consequential control, and program development (OASIS Parent Training, 2021). The pretest, posttest, and 16 modules are typically completed in 16–24 weeks.

Topics are presented to parents during each asynchronous online learning module, followed by a criterion-referenced assessment of the material. Then modeling, practice opportunities, and feedback are given during a weekly 1–2 hr synchronous coaching session. Coaches provide parents with data recording sheets and encourage parents to practice skills daily. Families participate in the sessions using their own technology.

The purpose of this study was to evaluate the procedures and feasibility of the OASIS program on parent outcomes to guide further research and refine the intervention. Specific research questions included:

1. Do caregiver's stress levels and quality of life change following the OASIS modules?
2. Does caregiver-reported confidence in their ability to parent their child with ASD increase following the OASIS modules?
3. Do caregivers consider telehealth a socially valid, feasible, and acceptable means of delivering BST ABA training?

## Method

### Participants

A university Institutional Review Board approved the study. Researchers recruited from the waitlist of the

university's autism diagnostic and research center. Parents were eligible if their child was between the ages of 3.0 and 5.9 yr, had a medical diagnosis of ASD, currently received no more than 10 hr/wk of ABA services, and if they were able to meet the technology and time requirements. After signing consent, the coaches and participants met virtually to review the requirements, answer questions about the study, and get acquainted. In this meeting and all subsequent meetings, the coach observed the child's behaviors and the parent shared information about their child's strengths and weaknesses so the coach would be better equipped to suggest individualized activities for the child each week. In addition, this discussion and observation ensured that the parent and child needed this training.

Three mothers and their 3-year-old sons with ASD participated. Mirabel was a married African American mother with a doctoral-level education; her son was Antonio. Antonio attended a brick-and-mortar special education preschool class. He labeled most common items but did not typically communicate in functional ways. Dolores was a married white mother with an associate-level education; her son was Bruno. Bruno had no formal means of communication and exhibited frequent elopement and task refusal. Bruno's family applied for special education services during the study. Mirabel and Dolores lived in rural areas, and Pepa in an urban city. Pepa was a married white mother with a bachelor's level education; her son was Felix. Felix was homeschooled, able to communicate verbally, and had a history of elopement and aggression. The OASIS coaches for this study were three doctoral-level white female graduate students. Each completed OASIS Coach Training before the study.

### Procedures

Prior to beginning intervention, families completed all study measures (described below in "Assessments"). During intervention, the parents completed the asynchronous learning modules and then met for approximately 1–2 hrs/wk with their OASIS coach. During coaching sessions, the coach reviewed online content, observed the parents using target skills, and provided coaching for the parent. In addition, parents completed a 5-min coached, unstructured play session each week with their child. During this playtime, coaches instructed the

mothers to use behavior-specific praise, imitate and expand on their child's language, provide behavioral descriptions, and avoid using questions and commands. Coaches instructed the parents in each of the concepts and reviewed their definitions, then prompted the parent in play opportunities in which the targeted skills could be used.

Parents completed post-assessments after the final coaching session.

### Implementation Fidelity

OASIS coaches monitored each family's independent progress by viewing their completion of each module, pre- and posttest, and quiz scores. The coaches used the OASIS scripted training protocol, which includes standardization for all areas of the training, a corresponding assessment protocol with checklists, a record of parent answers to open-ended questions, a record of coaching provided within each unstructured play and skill session, and a record of the parent skill data scores.

### Assessments

#### *Autism Parent Stress Index (APSI)*

The *APSI* (Silva & Schalock, 2012) is a 13-item self-report questionnaire. Caregivers rate aspects of their child's health (e.g., "tantrums/meltdowns," "sleep problems," and "child's ability to communicate") according to the level of stress it causes the caregiver (ranging from "not stressful" to "so stressful that we sometimes feel we cannot cope"). The overall *APSI* scale score has acceptable internal consistency and test–retest stability for parents of children with ASD (Silva & Schalock, 2012). A higher score on this measure indicates a higher level of perceived stress from the parent.

#### *Family Quality of Life (FQOL)*

The *FQOL* (Hoffman et al., 2006) scale includes 25 items that assess satisfaction with quality of life for families of children with disabilities. Families rate their satisfaction on a 5-point Likert scale across five domains: family interaction, parenting, emotional

well-being, physical/material well-being, and disability-related support. Each scale of the *FQOL* was found to be unidimensional and internally consistent, and test–retest reliability correlations were significant across subscales for ratings of satisfaction and importance (Hoffman et al., 2006). There is no average score or cut-off score for the *FQOL*; a higher total score indicates higher perceived quality of life.

#### *Parents of Children with Autism Self-Report*

The Parents of Children with Autism Self-Report is a 14-question parenting self-efficacy survey adapted from the *Parenting Sense of Competence Scale* (Gibaud-Wallston & Wandersman, 1978), with additional areas pertinent to parenting children with autism (e.g., communicating expectations, scheduling routines). Parents rated items on a six-point Likert scale. There is no average score or cut-off score for this measure and a higher total score indicates higher parent competence.

#### *OASIS pre and post-tests*

The OASIS curriculum includes pre- and posttests to measure parent knowledge of behavior analytic concepts covered throughout the training (Heitzman-Powell et al., 2013). Each 45-item multiple-choice exam is scored out of 100%.

#### *Intervention Rating Profile-15 (IRP-15)*

An adapted version of the *IRP-15* (IRP-15; Witt & Elliott, 1985) was used to measure treatment acceptability and social significance of the intervention. A six-point Likert scale ranging from strongly disagree to strongly agree was provided for each question. Total scores range from 15 to 90, and a higher score represents higher acceptability. The minimum acceptable score on the *IRP-15* is 52.5 (Von Brock & Elliott, 1987). The internal consistency of the original *IRP-15* is very good, with a reported Cronbach's alpha of 0.89 (IRP-15; Witt & Elliott, 1985).

#### *OASIS parent satisfaction survey*

The *OASIS Parent Satisfaction Survey* (Heitzman-Powell et al., 2013) gathered information on each parent's satisfaction with the OASIS intervention. This

survey has a mix of open-ended questions like “What did you like the most about the online training?” and multiple-choice questions like, “How would you rate your overall satisfaction with the online training system?” The multiple-choice questions are typically answered using a five-point Likert scale.

## Results and Discussion

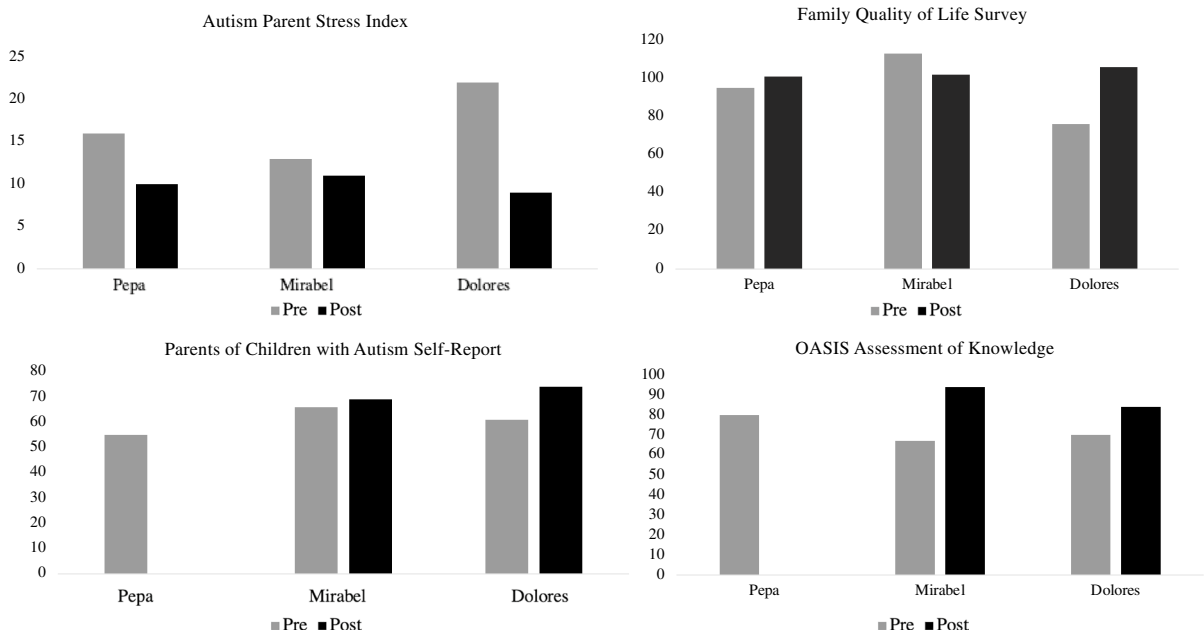
Pre-post results for the APSI, FQOL, Parents of Children with Autism Self-Report, and OASIS knowledge tests are shown in Fig. 1. Scores on the APSI decreased for all three parents, suggesting that stress levels were decreased following completion of the OASIS caregiver training. Quality of life was reported to increase for two of three parents (Pepa and Dolores), but decreased slightly for Mirabel. Mirabel and Dolores reported increases in their self-efficacy. Both strongly agreed to feeling confident in their ability to care for their child. In addition, they increased from somewhat agree to agree that they effectively managed their child’s problem behaviors. Both Mirabel and Dolores reported that they strongly agreed they felt comfortable asking for advice on ways to better support their child.

Mirabel and Dolores also demonstrated increased knowledge of content on the OASIS modules. Pepa did not complete the self-efficacy or knowledge postassessments.

All mothers rated the intervention as highly acceptable on the IRP-15. Pepa rated the intervention a 79 of 90, and Mirabel and Dolores an 80 of 90. Furthermore, all three mothers reported that they would recommend the intervention to others and felt they had benefited from inclusion in the study.

All parents reported that the coaching sessions helped them to learn about ABA. They were satisfied or very satisfied with the material covered, coaching sessions, and coach’s ability to address their child’s behaviors. Pepa and Mirabel reported learning a great deal from the training but felt that in-person intensive ABA would be more effective. However, this was not an option due to waitlists and lack of providers in their areas.

The study is limited by a lack of experimental control and a small sample size, but provides further evaluation of a telehealth intervention. We found OASIS to be viable for teaching ABA practices to parents of young children with ASD. These results align with the existing literature that telehealth is a viable option to disseminate behavior analysis to improve outcomes for families impacted by ASD.



**Fig. 1** Pre post assessment scores

## Declarations

The authors have no relevant financial or nonfinancial interests to disclose.

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