Received: 2 May 2021 | Revised: 27 October 2021 | Accepted: 15 November 2021

DOI: 10.1002/pits.22672

RESEARCH ARTICLE

WILEY

Exploring telehealth during COVID for assessing autism spectrum disorder in a diverse sample

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Abstract

Due to the coronavirus disease 2019 (COVID-19) pandemic, the importance of telehealth has rapidly increased, in particular as many in-person clinics have closed. Early intervention is crucial for improving outcomes in children with autism spectrum disorder (ASD). As such, the need for timely assessments and diagnoses remains despite COVID-19-related closures. This study offers preliminary data collected from 23 children assessed through a no-cost autism clinic in Southern California using a novel telehealth model. This includes an overview of an adapted, telehealth version of in-person observational assessment techniques for diagnosing autism. In addition, preliminary data on social validity assessed at two points are presented. Findings suggest that caregivers found the telehealth assessment procedures acceptable and convenient, and overall were satisfied with both the assessment and the written report/verbal feedback. Implications for future uses of telehealth are discussed, including how telehealth can assist with decision-making around school-based services and/or placement.

KEYWORDS
assessment, autism, telehealth

1 | INTRODUCTION

A timely diagnosis for autism spectrum disorder (ASD) is the fastest route to intervention. Previous research has demonstrated the efficacy of early intervention for young children with ASD (e.g., Prior et al., 2011). Particularly in early childhood, the window of opportunity should be acted upon to ensure optimal development. Notably, the lack of service providers in rural areas, who conduct early screening and diagnosis, places entire communities at risk of

not having children with ASD identified as needing services (Elder et al., 2016; Janvier et al., 2016). In addition, there are pervasive ethnic disparities evident in autism-related services in many areas of the country (Blacher et al., 2019; Zuckerman et al., 2014, 2017). On average, children from Latinx families are diagnosed later (and/or less frequently) than children from non-Latinx families (Baio et al., 2018; Maenner et al., 2020; Mandell et al., 2002; Zuckerman et al., 2013). Thus, there is increasing recognition that early identification and diagnosis is particularly necessary for groups who might otherwise not receive these services due to their geographic location, socio-economic status, ethnicity, or a combination of these factors. Telehealth has been discussed as a potential delivery method for diagnostic services, which could increase access to communities at risk (Alkhalifah & Aldhalaan, 2018; Juárez et al., 2018; Reese et al., 2015).

According to the American Psychological Association, telemental health is defined as "the provision of behavioral and/or mental health care services using technological modalities is lieu of, or in addition to, traditional face-to-face methods" (American Psychological Association, 2014, para 3). In the context of ASD, many studies on telehealth focused on providing a range of evaluation and intervention services, including functional behavior assessments (Machalicek et al., 2009), early intervention (Lindgren et al., 2020), cognitive-behavioral intervention (Hepburn et al., 2016), parent training (Pickard et al., 2016; Vismara et al., 2013), provider training (Vismara et al., 2009; Wainer & Ingersoll, 2013), and family support groups (Reese et al., 2015).

There is significantly less literature on the feasibility of utilizing telehealth to diagnose ASD (for reviews, see Alfuraydan et al., 2020; Alkhalifah & Aldhalaan, 2018; Antezana et al., 2017; Boisvert et al., 2010; Dahiya et al., 2020; Doyen et al., 2018; Goldstein et al., 2017; Knutsen et al., 2016; Narzisi, 2020; Sutherland et al., 2018). This may be partially because gold standard assessments of ASD, such as the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012), have been developed and validated using in-person contexts and have not been validated for remote use. The ADOS-2 is a semistructured, standardized assessment designed to elicit examples of social interaction and restricted interests or repetitive behaviors. The ADOS-2 consists of five modules (Toddler, Module 1, Module 2, Module 3, and Module 4) based upon the individual's language ability and age.

Considering the coronavirus disease 2019 (COVID-19) pandemic, the importance of telehealth—from screening and diagnosis to delivery of interventions—has increased, in particular as many in-person clinics have closed due to concerns about COVID-19 transmission. Even as some sectors of the economy begin to reopen, clinics have largely remained closed or operate remotely due to the increased susceptibility to COVID-19 for specific populations, including individuals with ASD and related developmental disabilities (Landes et al., 2020). Given the prolonged closures and/or hybrid operations of clinics, it is vital for clinical providers to consider the development of "pipelines" to provide clients with access to high-quality initial screening and diagnosis using telehealth.

The purpose of this study is to first describe a model of telehealth that has been adapted to serve a population of culturally, linguistically, and economically diverse families; and second, to present preliminary data on social validity that attests to the feasibility and acceptability of the telehealth model.

1.1 | Current study framework

The data in the present study were collected through a no-cost autism screening clinic in inland Southern California. The purpose of the screening clinic (SEARCH) is to assess children for ASD and to serve low-income and/or Spanish-speaking families within the community. Tailored and personalized referrals were made after assessment completion, to ensure families receive proper intervention and care. The screening clinic prioritizes children between the ages of 3 and 10 years old but also sees children of other ages depending on individual need and availability.

The staff includes faculty and advanced graduate students in Special Education and School Psychology doctoral programs at the University of California, who are certified in autism gold standard assessments (e.g., ADOS-2; Lord et al., 2012), as well as licensed and credentialed consultants. Bilingual staff were also available to provide assessments, feedback, and reports in Spanish.

Due to the COVID-19 pandemic, the screening clinic team developed a remote protocol for assessments via telehealth for children with phrase speech or fluent speech (TELE-ASD-KIDS, see below) and utilized an existing protocol to assess children who were either minimally verbal or who did not have verbal speech (TELE-ASD-PEDS, Corona et al., 2020, see below). In cases where ASD and/or intellectual disability (ID) could not be reliably determined via telehealth, caregivers and children were invited to return for a full in-person assessment once restrictions are lifted.

2 | METHODS

2.1 | Participants

Participants were referred by educational and medical providers. Referrals were predominantly made by teachers, pediatricians, or mental health professionals. Families were also able to call the screening clinic directly if they had concerns regarding their child's behavior. Table 1 includes all participants assessed through the Telehealth protocol from July 2020 to March 2021.

2.2 | Measures

2.2.1 | TELE-ASD-PEDS

The TELE-ASD-PEDS (Corona et al., 2020) was developed to assess ASD through remote means (e.g., video conferencing). The measure was developed for young children between the ages of 1 and 3 years who do not yet have verbal speech. The assessment is conducted by trained assessors who provide directions to the caregiver to perform semistructured activities with their child. The protocol includes 12 activities, such as play (e.g., caregivers were asked to have three to five toys ready for the child to play with independently or joint play with caregiver) and peek-a-boo

TABLE 1 Participant demographics

Participant characteristics	
n	23
Sex (% male)	78.3%
Age (months)	81.7 (39.8)
Primary Household language	
English	78.3%
Spanish	17.4%
Other	4.3%
Race/ethnicity	
Asian	4.3%
African American/Black	8.7%
Hispanic/Latinx	39.1%
White	26.1%
Mixed	21.7%
Family income (% <$50,000)	43.4%

(see Corona et al., 2020 for more information). Preliminary data from the TELE-ASD-PEDS suggests that it is a useful and valid method of diagnosing ASD using telehealth. In preliminary investigations, most of the children assessed were identified as either having ASD or not having ASD. For a small number of children, clinicians were uncertain of the diagnosis and in-person assessments were recommended (Wagner et al., 2021; Corona et al., 2020).

2.2.2 | TELE-ASD-KIDS

The TELE-ASD-KIDS was based on both Modules 2 and 3 from the ADOS-2 and the TELE-ASD-PEDS and reflects the ADOS-2 recommendations for use with children with verbal language abilities. The format was similar to the TELE-ASD-PEDS but included additional activities from the ADOS-2 Modules 2 and 3 (Lord et al., 2012), which were amenable to telehealth administration. TELE-ASD-KIDS Module 2 included 15 activities, some of which were from the TELE-ASD-PEDS and involved the caregiver (e.g., play and snack), and others from the ADOS-2 Modules 2 and 3 which were completed with the assessor (e.g., description of a picture). TELE-ASD-KIDS Module 3 included 11 activities from the ADOS-2 Module 3 and did not require a caregiver to be present. Specific activities from the ADOS-2 Module 3, which were amenable to being administered remotely, were chosen for this protocol (e.g., looking at a picture together by sharing the assessor's screen and questions about the child's friends and emotions).

All protocols included codes that were completed by the assessor after administration. The number of codes ranged per module. The TELE-ASD-PEDS contained 7 codes (see Corona et al., 2020 for a detailed description), TELE-ASD-KIDS Module 2 contained 9 codes, and TELE-ASD-KIDS Module 3 had 10 codes. The coding system for the TELE-ASD-KIDS was adapted from the TELE-ASD-PEDS and from the ADOS-2 Modules 2 and 3. Each code represents a behavior associated with ASD (e.g., socially directed speech and eye contact) and was scored using both dichotomous and Likert formats as per the TELE-ASD-PEDS (Corona et al., 2020). For the dichotomous score, assessors decided whether there was little to no evidence of ASD behaviors or if behaviors associated with ASD were present. A code of "1" indicated little to no evidence of ASD and a score of "3" indicated behaviors associated with ASD. For the Likert scale, assessors utilized the following codes: 1 (no ASD behaviors), 2 (some ASD behaviors observed, but not clear or occurred at a low frequency), and 3 (clear ASD behaviors). In addition, assessors rated several general items pertaining to the case (e.g., diagnostic impression, overall confidence in their diagnostic impression, and confidence that the codes accurately represent symptoms associated with ASD for the given child). This scoring system was based on the TELE-ASD-PEDS protocol (Corona et al., 2020).

Assessors trained until their scoring was "reliable" on the TELE-ASD-PEDS and/or TELE-ASD-KIDS. Clinic members were reliable once they reached agreement at 80% or more with the lead assessor (e.g., clinic directors who were research reliable on the ADOS-2) on three consecutive assessments. Once clinic members demonstrated that their scores were reliable, they assisted with live administration under the supervision of the clinic's directors. For all cases reported in this manuscript, overall scoring reliability was 83.60%. The range of reliability was 69.94%–100%. During each telehealth appointment, either one or both directors of SEARCH were present to observe the assessments. Finally, researchers and clinicians were mindful of APA guidelines for utilizing telehealth ("tele-assessment" during COVID-19; Wright et al., 2020). In addition to coding the TELE-ASD-PEDS or TELE-ASD-KIDS, each assessment was followed by a discussion of clinical characteristics and concerns. This was especially important for inconclusive cases.

2.3 | Cognitive assessments

One of two cognitive assessments was administered based on the child's age.

2.3.1 | Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition (WPPSI-IV)

The WPPSI-IV (Weschler, 2012) was administered to children aged between 2 years 6 months and 5 years 11 months. From the WPPSI, two versions were adapted for the telehealth clinic; the version for younger children (aged 2 years 6 months to 3 years 11 months) included two subtests that could be administered virtually: Receptive Vocabulary and Information. The version for slightly older children (4 years and older) utilized four subtests that could be administered virtually: Receptive Vocabulary, Matrix Reasoning, Information, and Picture Concepts. These four subtests resulted in two composite scores as follows: Verbal Comprehension and Fluid Reasoning. Both versions were pilot tested by the clinical team to determine feasibility and usability. Issues that prevented administration, such as child inattention and/or hyperactivity, were the same we occasionally encountered in our clinic before the pandemic. Although the full-scale intelligent quotient (FSIQ) was not calculated, the four-subtest version has demonstrated predictive validity ($r = .90$) and adequate reliability ($r = .95$) as an indicator of cognitive ability (Sattler & Dumont, 2004) when administered in-person. To our knowledge, there is no information about predictive validity or reliability between these subtests when administered virtually versus in-person.

2.3.2 | Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II)

The WASI-II (Wechsler, 2011) was administered to individuals older than 6 years old. The Vocabulary and Matrix Reasoning subtests were used; scores were combined to calculate a FSIQ-2 composite score (Wechsler, 2011). The reliability between the FSIQ score of four subtests compared with two subtests is similar. The FSIQ-4 has a reliability coefficient of .96, whereas the FSIQ-2 has a reliability coefficient of .93 (McCrimmon & Smith, 2013). Although these two subtests are valid for calculating IQ when administered in-person, we are not aware of research investigating the agreement between virtual and in-person methods of assessment. For all children, results of the cognitive assessment were included in the final report.

2.4 | Parent/caregiver questionnaires

2.4.1 | Social Communication Questionnaire (SCQ)

The SCQ (Rutter et al., 2003) assesses communication skills and social functioning related to ASD. The current version of the SCQ was used, which evaluates social behaviors within a 3-month period. Total scores range from 0 to 40; lower scores indicate less prominent symptoms related to ASD, whereas higher scores indicate more ASD symptomatology. The publisher recommends a cutoff point of 15 (e.g., children with scores of 15 or higher are considered to have substantial risk of ASD). When using the publisher's recommended cutoff score of 15, the sensitivity and specificity were respectfully 0.96 and 0.80 for autism (Rutter et al., 2003). However, past studies have found more compelling sensitivity and specificity when the cutoff score is lowered (Barnard-Brak et al., 2016). Therefore, our clinic utilized a cutoff score of 10.

In the current study, the SCQ was completed over the phone during an initial intake to determine the number of ASD-specific behaviors. A cutoff score of 10 and clinical judgement was used to determine who to schedule for a telehealth assessment. Those who did not make this cutoff (i.e., received a score <10) were referred elsewhere (e.g., to a medical provider for genetic testing; a clinical psychologist for child or family therapy; to the public school for services and assessment by a school psychologist; to a psychiatrist for medication), as their risk of having ASD was considered low. For those who scored >10, a telehealth appointment was scheduled.

2.4.2 | Social Responsiveness Scale, Second Edition (SRS-2)

The SRS-2 evaluates social impairments related to ASD in individuals who are at least 2 years and 6 months old. Caregivers completed the 65 Likert-item questions that range from 0, meaning not true, to 4, indicating almost always true. Subscales and total scores were calculated based on the caregiver's responses (Constantino, 2012). Caregivers completed this questionnaire online before their telehealth appointment. Results from this questionnaire were included in the final report. The reliability of this questionnaire ranged from 0.94 to 0.96 for internal consistency (Bruni, 2014). As for validity, the SRS has a specificity and sensitivity of 0.92 (Bruni, 2014).

2.4.3 | Vineland Adaptive Behavior Scales, Third Edition (VABS-3): domain level

The VABS-3 (Sparrow et al., 2016) is used to assess age-appropriate adaptive behaviors. VABS-3 domain-level forms were completed by caregivers before their telehealth appointment. Standardized composite scores included communication, daily living skills, and socialization subscales, which make up the VABS-3 Adaptive Behavior Composite. For children up to age 9 years, an optional motor skills composite score can be calculated. In addition, an optional maladaptive scale consisting of an externalizing and internalizing behaviors can be obtained. Standard scores on the VABS-3 have a mean of 100 and an SD of 15 (Sparrow et al., 2016). The domain-level VABS-3 form is reported to have strong reliability, with scores of 0.86–0.97 for internal consistency and 0.62–0.92 test–retest reliability (Pepperdine & McCrimmon, 2018). As for validity, moderate to high correlations were reported for concurrent validity across all domain scores (ranged from 0.67 to 0.81; Pepperdine & McCrimmon, 2018). Results from this questionnaire were included in the final report.

2.5 | Social validity questionnaires

Caregivers were given the opportunity to provide comments about their experience with telehealth. Questions regarding the telehealth assessment were sent to the families after their appointment, whereas the questionnaire about the feedback and report was sent following their feedback appointment. The social validity questionnaires were developed based on previously published validity questionnaires for families after telehealth appointments (Stainbrook et al., 2019).

2.5.1 | Social validity questionnaire—assessment

This questionnaire asked caregivers about their telehealth experience. Caregivers answered 11 Likert questions about the assessment and intake process. In addition to these questions, caregivers were asked to provide how far away they were located from the clinic and if they had participated in telehealth appointments before.

2.5.2 | Social validity questionnaire—report/feedback

Caregivers were asked eight questions about the feedback process (e.g., oral feedback provided to parents about overall diagnostic impressions and recommendations) and written report. In addition, caregivers answered questions about where they planned on sending the report (e.g., school, physician, and therapist) and, if relevant, how they planned on using the report.

2.6 | Procedure

Parents or caregivers made initial contact with the clinic, often self-referred or referred by their physician, school, or other provider. After that, they were contacted by clinic staff via phone or email to schedule a phone screen intake to determine whether they were eligible for an assessment. During the phone screen intake, caregivers were asked basic demographic questions (e.g., name, phone number, address, or email), who referred them, and to list general concerns they had about their child. Following this, the SCQ (Rutter et al., 2003) was administered. If the child scored <10 on the SCQ, the family was referred elsewhere (see above). If the child scored a ≥10 on the SCQ, the caregiver was informed that they met eligibility and were scheduled for a telehealth appointment (see Figure 1).

Caregivers were contacted before the appointment to review what to expect at their appointment, and were given information on how to access the video platform (i.e., Zoom). During this phone call, caregivers were encouraged to ask questions about the appointment and the technology to be used. Caregivers were informed that there would be from two to five members on the call, as some were observers learning telehealth procedures. At this time, caregivers were informed that they would receive an email with a link to fill out the clinic's consent form and other caregiver questionnaires about their child. Caregivers were encouraged to reach out to the clinic if they had any questions or concerns.

The telehealth appointment consisted of a cognitive assessment, autism assessment, and open-ended questions from the screening team to obtain additional information about the child.

The TELE-ASD-KIDS or TELE-ASD-PEDS was administered (as appropriate for the child's language level) by either a licensed clinician or trained graduate student. Language level was determined through the initial phone call intake with the caregiver (e.g., items on the SCQ probe whether the child talks in complete sentences or short phrases). Language level was further confirmed during the cognitive assessment. The person administering the assessment followed the script as described by the TELE-ASD-KIDS or TELE-ASD-PEDS protocol and took notes on the child's behavior and social communication skills; at least one other team member took notes simultaneously. Following the assessment, the caregiver had the opportunity to ask the team additional questions. Immediately following the appointment, the team met to code the autism assessment and discuss clinical impressions. Following the appointment (but before receiving diagnostic/clinical feedback from the team), caregivers were sent an email requesting that they complete a brief questionnaire regarding their telehealth experience (e.g., satisfaction with the procedure and technology).

A written report was generated describing clinical findings, caregivers' concerns, and providing recommendations. Before sending the report to caregivers, a feedback call (or Zoom, as preferred) was scheduled to provide a summary of the assessments and review individualized recommendations for the child. Finally, caregivers were either provided with a phone call or email requesting that they complete a final questionnaire regarding their satisfaction with the report and clinician feedback (Table 2).

3 | RESULTS

3.1 | Assessment results

Of the 23 children who were assessed between July 2020 and March 2021, 11 met criteria for ASD (4 of these met for ASD + ID), 2 met for ID only, and 10 children had neither ASD nor ID. Results are shown in Table 3. It should also be noted that 17% of the assessments were conducted in Spanish, based on the caregivers' and/or the child's language preference.

In addition to receiving an assessment report that contained material addressing whether ASD or ID could be ruled in or out, families were provided with recommendations about services that might be appropriate for

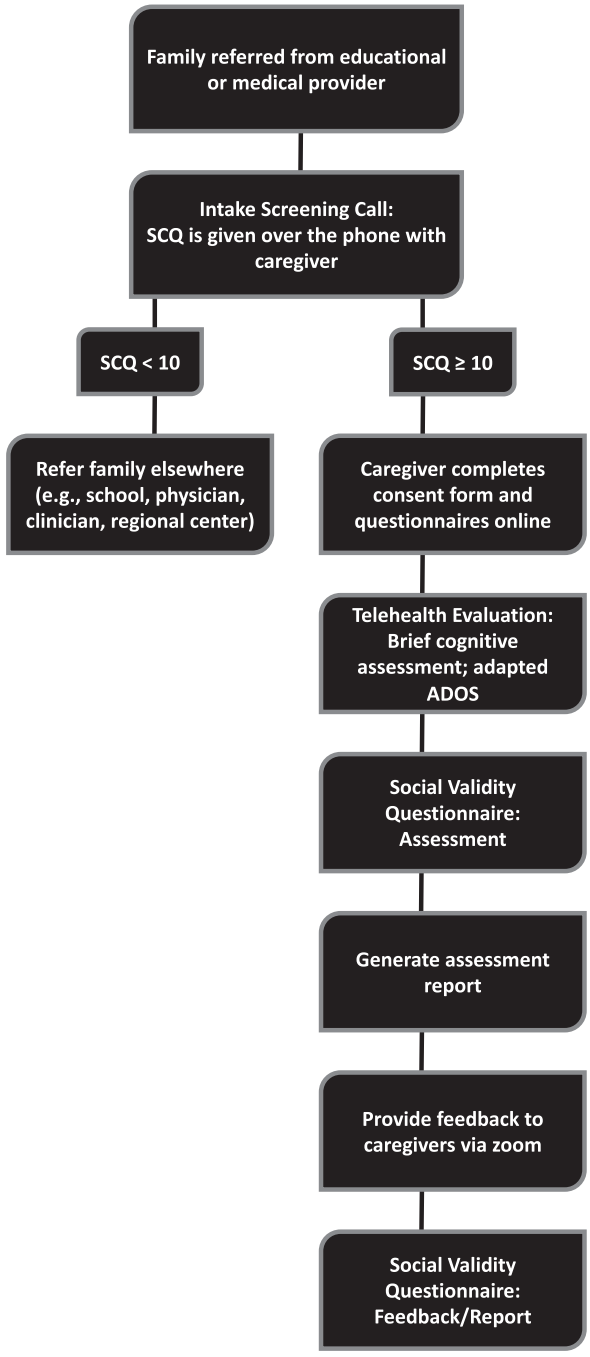

FIGURE 1 Clinic telehealth process. Abbreviations: ADOS, Autism Diagnostic Observation Schedule; SCQ, Communication Questionnaire

their child, and suggestions about where to obtain those services. The most frequent of these were recommendations pertained to school assessments or services (e.g., either a full psychoeducational assessment, or requesting services based on a preexisting Individualized Education Program [IEP]). A total of 17 out of 23 (74%) families were provided such school recommendations, whereas the remaining 6 families received

TABLE 2 Clinical protocols and activities

Assessment	Number of activities and codes	Total activities
TELE-ASD-PEDS	See Corona et al. (2020) for full list of 12 activities and 7 codes	
TELE-ASD-KIDS Module 2	15 Activities and 9 codes	• Introduction[a] • Cause and effect toys[a] • Calling name #1[a] • Directing child's attention #1[a] • Joint play[a] • Calling name #2[a] • Directing child's attention #2[a] • Descriptions of a picture[b] • Conversation[b] • Demonstration task[b] • Familiar play routine[a] • Ready, set, go[a] • Closed container/snack[a] • Free play ignoring[a] • Closing[a]
TELE-ASD-KIDS Module 3	11 Activities and 10 codes	• Introduction[a] • Description of a picture[b] • Conversation[b] • Demonstration task[b] • Cartoons[b] • Emotions[b] • Social difficulties/annoyance[b] • Friends, relationships, marriage[b] • Loneliness[b] • Light conversation, end on a positive note[b] • Closing[a]

Note: Codes available from corresponding author.

Abbreviation: ADOS, Autism Diagnostic Observation Schedule.

[a]Adapted from the TELE-ASD-PEDS (Corona et al., 2020).

[b]Adapted from the ADOS-2 (Lord et al., 2012).

TABLE 3 Assessment results

	Diagnostic categories				
	ASD only*n* (%)	ASD + ID*n* (%)	ID only*n* (%)	Other*n* (%)	Full sample
Results for diagnostic impression	7 (30%)	4 (17%)	2 (10%)	10 (43%)	23
Report included recommendations–school services	6 (35%)	3 (18%)	2 (12%)	6 (35%)	17
To see in-person for ASD reevaluation	0 (0%)	1 (20%)	0 (0%)	4 (80%)	5

Abbreviation: ASD, autism spectrum disorder.

recommendations for specific services, such as speech therapy or social skills training, which could be provided through insurance. If the assessment results were unclear and a diagnosis of ASD could not be determined, caregivers were informed that they were eligible for an in-person assessment once it was safe to do so. Five cases fell into this category (see Table 3 for details).

3.2 | Social validity—assessment

Caregivers completed the social validity questionnaire related to the assessment within 2 weeks of their appointment up to 7 months after their assessment date. Of 23 families, 15 caregivers completed this questionnaire. All of the caregivers reported that they either agreed or strongly agreed that the assessment process was easy, and the majority of caregivers did not have to learn how to use new technology before the appointment (80%). Caregivers reported that the telehealth technology worked well for their child (80%). Overall, 93.3% of caregivers were satisfied with the telehealth assessment process. Eighty percent of caregivers reported that the telehealth assessment was convenient. On average, it would have taken caregivers around 32.2 min to drive to the clinic. This commute time ranged from 0 to 120 min.

The final question to the social validity questionnaire allowed caregivers to provide any comments or suggestions about the telehealth process. Some caregivers reported positive statements, such as, "The whole process was incredibly easy… I wish everything was telehealth. Even if it wasn't the pandemic, with multiple children and going back and forth gets hard. It was the best experience ever" and, "This was an easy process." Others offered suggestions such as priming caregivers on what to do or how to act during assessments, because they were unclear about when they should have been helping their child and when they should not have helped. Some parents acknowledged the difficulties of telehealth: "…it was difficult to get a little one an assessment when [they] can't stay near the computer, but under COVID circumstances it's what we had to do." Another caregiver remarked, "Especially with assessments, it is more effective in person because you can interact with the child and see the child in a different environment, which is needed with a child with different behaviors." Data on the social validity questionnaire of the assessment process can be found in Table 4.

3.3 | Social validity—report/feedback

Of 23 families, 9 completed the second follow-up social validity questionnaire that focused on the written report and oral feedback provided by the assessment team. The majority of caregivers (89%), felt as though the written report was helpful for making decisions about their child's needs and 100% of respondents reported that the recommendations seemed feasible and clear. Regarding the feedback session itself (during which assessors reviewed the results of the written report with families), 100% of caregivers reported that the feedback was clearly presented, delivered respectfully, and that all their questions were answered. One hundred percent of caregivers reported that the oral feedback matched the report (e.g., that the two modalities of communicating assessment results were congruent). Finally, caregivers were asked to share how they planned to utilize the written report (e.g., share with school, therapist, and other). Over half of the respondents (five) planned to send the report to the school directly for the purpose of an IEP, three planned to send the report to their child's teacher, four planned to share the report with the child's therapist, and three planned to share the report with their child's primary doctor. It was less common for parents to report plans to send the report to the Regional Center (in California, Regional Centers are state agencies that help coordinate services for children with ASD and other developmental disabilities), or to their insurance company (see Table 5 for details).

4 | DISCUSSION

Although the COVID-19 pandemic inspired the development of the telehealth procedures described herein, the concept is one that was well overdue. These findings, although from a small sample, suggest that both screening and diagnosing of ASD are feasible using adapted versions of gold-standard instruments. Modeled after the TELE-ASD-PEDS (Corona et al., 2021; Wagner et al., 2021), the TELE-ASD-KIDS reported here mapped onto the *ADOS* Modules 2 and 3 (Lord et al., 2012). Although results indicated staff could reliably and feasibly administer and score

TABLE 4 Social validity questionnaire—assessment

Total respondents (*n*)Administered inSpanish (%)	1520.0%				
Social validity questions	**Strongly disagree**	**Disagree**	**Undecided/neutral**	**Agree**	**Strongly agree**
I thought the telehealth assessment process was easy	–	–	–	60.0%	40.0%
Most people would find the telehealth assessment process easy to follow	–	–	6.7%	60.0%	33.3%
I needed to learn a lot of things about technology before I could start this telehealth assessment	53.3%	26.7%	13.3%	–	6.7%
I was able to communicate my concerns to the SEARCH team member or assessor	–	–	–	40.0%	60.0%
I felt that the assessor was able to collect important information about my child	–	–	6.7%	66.7%	26.7%
The technology used for the assessment (e.g., computer, Zoom/video conferences, phone) worked well for me	–	13.3%	–	46.7%	40.0%
The technology used for the assessment (e.g., computer, Zoom/video conferences, phone) seemed to work well for my child	–	13.3%	6.7%	66.7%	13.3%
I felt that my child's assessment was just as private as an in-person visit	–	6.7%	–	33.3%	60.0%
Telehealth made the entire assessment process more convenient	6.7%	13.3%	–	26.7%	53.3%
I am interested in participating in future telehealth visits	–	6.7%	6.7%	46.7%	40.0%
Overall, I am satisfied with my telehealth experience	–	–	6.7%	60.0%	33.3%
Before your current child's autism assessment, have you ever participated in telehealth for medical care (either parent or child)?					
Yes (%)	60.0%				
No (%)	40.0%				
About how long would it take you to drive to the clinic in minutes?	32.2 (25.4)				

TABLE 5 Social validity questionnaire—report and feedback

Total respondents (*n*)	**9**				
Administered in Spanish (%)	**33.3%**				
Social validity questions—written report	**Strongly disagree**	**Disagree**	**Undecided/neutral**	**Agree**	**Strongly agree**
The information I received in my child's assessment report will help me make decisions about my child's support needs	–	–	11.1%	66.7%	22.2%
The assessment report I received was clearly written	–	–	–	55.6%	44.4%
The written report matched with the verbal feedback I received over the phone	–	–	–	55.6%	44.4%
The recommendations provided in my child's assessment report were concrete and seem feasible to carry out	–	–	–	77.8%	22.2%
Social validity questions—feedback session	Strongly disagree	Disagree	Undecided/neutral	Agree	Strongly agree
The feedback I was provided by phone about the results of my child's assessment were clearly presented.	–	–	–	55.6%	44.4%
The staff member providing feedback took my concerns seriously.	–	–	–	55.6%	44.4%
The feedback I received about the results of my child's assessment was presented in a sensitive and respectful manner.	–	–	–	55.6%	44.4%
During my feedback session, all of my questions were answered.	–	–	–	55.6%	44.4%
I plan to send my report to my child's (%):					
Teacher	33.3%				
School–for IEP plan	55.6%				
Therapist	44.4%				
Primary doctor	33.3%				
Regional center	22.2%				
Insurance company	11.1%				
Are not sharing report	33.3%				

Abbreviation: IEP, Individualized Education Program.

the TELE-ASD-KIDS, true accuracy will be determined once findings can be compared with in-person assessment across participants (e.g., the same child receives both telehealth and in-person assessments, administered by different assessors). This comparison is already planned and will take place once all restrictions due to COVID-19 are lifted.

The social validity of the telehealth assessment protocol described here was determined to be high, with over 80% of respondents indicating that they agreed or strongly agreed with 11 out of the 11 items, including the 1 item which was reverse coded. These items referred to the telehealth process itself, the caregiver's role in it, aspects of privacy, and technical aspects, and are consistent those reported by Corona et al. (2021). We note, however, that there was a relatively low response rate (~40% of families filled out social validity questionnaires). Given the small sample size, it is important to consider that the experiences reported by these families may not be reflective of the "average" experience (e.g., families who filled out the questionnaire may have had more positive or more negative experiences than the average family). Despite the small sample size, positive results on the acceptability and satisfaction of the reported telehealth procedures bodes well for continuing this methodology well after the COVID-19 pandemic ceases to be a crisis.

In addition, this study reported social validity data for the written report and feedback session separately from the report of social validity data about the assessment process. Our goal was to determine how caregivers felt about both important parts of the telehealth process. Although only nine caregivers completed this second social validity questionnaire, results speak to the efficacy of both written and oral communication of clinical impressions, diagnosis (if applicable), and recommendations. Over 85% of caregivers who completed the questionnaire felt as though the written report was helpful for making decisions about their child's needs and all reported that the recommendations seemed feasible and clear. Regarding the feedback session itself, all caregivers reported that the feedback was clearly presented, delivered respectfully, and that their questions were answered. Regarding how parents planned to utilize the written report, over half planned to send the report to their child's school and one-third planned to send the report to their child's teacher. This speaks to the utility of telehealth assessments and reports for school-based eligibility determinations and decision-making related to services.

Telehealth is not a panacea and there are limitations to be recognized. First, more accurate estimates of reliability await the end of the pandemic and many more cases to be seen, some both in telehealth and in-person formats. Second, some assessments are more challenging than others via telehealth methods, such as administering cognitive tests; assessments that involve manipulatives are also quite difficult. Third, subtle speech or anxiety issues may go undetected in this format, although this underscores the importance of the interview with parent or caregiver. In the present study, there were at least two opportunities to gather such information, during the phone-screen and at the assessment itself.

However, there are two important implications of the findings presented. The first is that briefer, more targeted assessments for ASD are feasible and promising. At the very least, this methodology will allow more expanded screening and diagnosis, which is critical in areas of the country that lack providers and for individuals from traditionally underserved/minoritized backgrounds. The second is the possibility for closer collaboration with public schools. As shown in this study, the majority of recommendations to parents/caregivers included school involvement and over half of parents who responded to the social validity questionnaire related to the written report indicated that they planned to share the report with their child's school. Often parents do not know their rights or the procedures under federal law (Individuals with Disabilities Education Act, 2004), which open the door to communication with school psychologists and the possibility of obtaining an IEP for their child. In other cases, parents are unsure of what steps to take if they wish to request modifications or additions to the services their child currently receives. When schools receive a report from a clinic like SEARCH, it saves time for all involved and often results in the most appropriate educational placement for the child.

Finally, going forward, telehealth ASD assessment may become an "equalizer," bringing the possibility of diagnosis and early intervention to all families, regardless of socioeconomic, racial, or ethnic status. For too long, there have been disparities in access to early autism identification and in families' understanding of autism (Blacher et al., 2019). With such new procedures, conducted in Spanish as well as English, timely access to those living in rural and desert areas will be possible.

ACKNOWLEDGEMENTS

We would like to thank all SEARCH Center staff and all children and families who have come to the clinic (virtually) during this time.

CONFLICTS OF INTEREST

The authors declare that there are no conflict of interests.

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How to cite this article: Stavropoulos, K. K., Heyman, M., Salinas, G., Baker, E., & Blacher, J. (2022). Exploring telehealth during COVID for assessing autism spectrum disorder in a diverse sample. *Psychology in the Schools*, 59, 1319–1334. https://doi.org/10.1002/pits.22672