Research Article

Supporting Emergent Bilinguals Who Use Augmentative and Alternative Communication and Their Families: Lessons in Telepractice From the COVID-19 Pandemic

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ABSTRACT

Purpose: The purpose of this project was to examine the effect of the COVID-19 pandemic on speech-language pathologist (SLP) service provision for emergent bilinguals who use augmentative and alternative communication (AAC). One prominent issue in AAC service delivery is the efficacy and feasibility of providing AAC services via telepractice. The COVID-19 pandemic intensified this issue as most providers, clients, and families adjusted to remote service delivery models. While emerging evidence supports telepractice in AAC, little is known about the potential benefits and challenges of telepractice for emergent bilinguals who use AAC and their families.
Method: Data were collected via a nationwide survey. Licensed SLPs ($N = 160$) completed an online questionnaire with Likert-type, multiple-choice, and open-ended questions, analyzed using mixed methods.
Results: Findings illustrated a shift in service delivery from in-person to telepractice and hybrid (both telepractice and in-person) models. Overall, child intervention outcomes declined for emergent bilinguals who used AAC during the COVID-19 pandemic, regardless of service delivery format. However, collaboration increased for many providers and families. Qualitative analyses highlighted barriers to AAC service provision for emergent bilinguals who use AAC that were exacerbated by the COVID-19 pandemic, as well as factors that facilitated collaboration and family engagement.
Conclusion: These findings suggest that, despite challenges, telepractice or hybrid services may be a promising approach to provide more culturally responsive, family-centered care for emergent bilinguals who use AAC.
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Speech-language pathologists (SLPs) often provide services to children with complex communication needs who use or may benefit from augmentative and alternative communication (AAC). A growing number of these children come from homes where a language other than, or in addition to, English is spoken. Despite a steady increase in scientific inquiry in bilingualism in recent decades, little empirical research has investigated service delivery issues for bilingual children who use AAC. One prominent issue in AAC service delivery is the efficacy and feasibility of providing AAC services via telepractice—an issue that was forefronted by the COVID-19 pandemic as most providers, clients, and families adjusted to remote service delivery models. While emerging evidence supports telepractice in AAC, little is known about the potential benefits and challenges of telepractice for emergent bilinguals who use AAC and their families. The purpose of this article is to explore the impact of the COVID-19 pandemic on service provision for emergent bilinguals who use AAC and to identify lessons from telepractice that may inform service delivery moving forward and ultimately improve child and family outcomes for this underresearched population.

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Emergent Bilingualism and AAC

The population of children learning more than one language who also use or may benefit from AAC is diverse in linguistic and cultural backgrounds and communication abilities and modalities. Garcia (2009) proposed the term *emergent bilinguals* (as opposed to English language learner or limited English proficient) to break down ideologies that promote a deficit perspective of bilingualism, instead reframing bilingualism as a communicative and social resource that harnesses the power of the child's home language and culture. In this article, we have conceptualized the definition of emergent bilinguals to include any child who comes from a home where a language other than, or in addition to, English is spoken by some family members, regardless of proficiency level. This definition includes children with language impairments or intellectual disabilities and children who may not use spoken language as a primary communication modality. This article also adopts a broad conceptualization of AAC (American Speech-Language-Hearing Association [ASHA], 2022a; Beukelman & Light, 2020), defining an AAC user as anyone who communicates using aided or unaided AAC modalities to supplement or replace their speech. Aided AAC systems involve an external communication tool such as computerized devices (e.g., speech-generating devices, mobile technologies with AAC apps), noncomputerized electronic devices (e.g., switches or buttons with recorded messages), or paper-based systems (e.g., communication boards or books). Unaided AAC does not involve an external communication tool but instead describes facial expressions, gestures, and signs used to supplement or replace spoken communication.

Prevalence estimates of emergent bilinguals in the United States who use AAC are challenging to obtain. However, data from the 2019 U.S. Census Bureau American Community Survey indicated that 23% of children ages 5–17 years speak a language other than English at home, with state-level estimates increasing to 28% in Arizona, 30% in Florida, and 43% in California (Kids Count Data Center, 2020). At the same time, estimates indicate that in the United States, 12%–18% of preschool and school-age children receiving speech-language pathology or special education services may use or benefit from AAC (Andzik et al., 2018; Binger & Light, 2006). A 2020 ASHA survey of 1,279 school-based SLPs indicated that, for SLPs who reported working with students who were nonverbal or used AAC, there were about 6.5 students per caseload in that category (ASHA, 2020a). And in a recent survey of school-age children in New Mexico, Binger et al. (2021) reported that approximately one in 89 K–12 students had highly unintelligible speech. From these data, we can infer that millions of children in the United States are emergent bilinguals who may benefit from AAC

technologies to support their language development and participation across social and academic contexts.

Despite the growing prevalence of emergent bilinguals who use AAC and continued calls for research with this population (Bridges, 2004; Kulkarni & Parmar, 2017; Light & McNaughton, 2012; Light et al., 2019; Soto & Yu, 2014; Tönsing & Soto, 2020; Woll & Barnett, 1998), to date, only a handful of published papers have addressed service delivery issues for emergent bilinguals who use AAC. This lack of research represents a significant gap in provider training and resources for SLPs working with emergent bilinguals who use AAC. According to ASHA, only 8% of ASHA-certified SLPs and audiologists reportedly identified as bilingual service providers (ASHA, 2021a), and only 8% of school-based SLPs (*n* = 1,689) reported that they felt very qualified to provide services to children from culturally and linguistically diverse (CLD) backgrounds (ASHA, 2016). Similarly, AAC service delivery is an area of practice in which SLPs report low confidence partly due to numerous barriers to AAC access and service provision (Marvin et al., 2003; Sanders et al., 2021). Recently, however, telepractice has gained recognition as a potential evidence-based solution to overcome some of the barriers in SLP service provision and access to hard-to-reach populations, including children from CLD backgrounds and children who use AAC (Molini-Avejonas et al., 2015; Theodoros, 2012).

Telepractice in SLP Service Delivery

Since 2005, ASHA has recognized telepractice as an appropriate model of service delivery for speech-language pathology and audiology services. Telepractice is defined as the application of telecommunications technology to deliver clinical services at a distance including assessment, intervention, and/or consultation (ASHA, 2022b). Telepractice can be synchronous (real-time audio and video interaction between client and clinician), asynchronous (data and images are captured and transmitted for later viewing), or hybrid (combining synchronous, asynchronous, and in-person services). Despite challenges (e.g., privacy concerns, limitations in high-speed Internet access, and mobile technologies), telepractice can help address barriers to service delivery through expanded access to individuals in rural areas or with transportation difficulties, increased flexibility to accommodate family members' work schedules and availability, and increased access to specialist services (Campbell & Goldstein, 2022).

In the field of speech-language pathology, telepractice has been used to deliver services across the scope of practice, and there is growing evidence that services provided to children and adolescents with communication disorders via telepractice can be as effective as face-to-face (e.g., Brignell et al., 2021; Camden et al., 2020; Molini-Avejonas et al.,

2015). Before the COVID-19 pandemic, telepractice was gaining traction as a viable service delivery option with a particular focus on providing specialized services or reaching clients in rural areas. Nevertheless, prior to the COVID-19 pandemic, the use of telepractice in speech-language pathology was minimal, with only 4.5% of clinicians (ASHA certified providers, $n = 5,673$) reporting that they regularly provided telepractice services (ASHA 2020 May survey, ASHA, 2020b). However, restrictions on in-person interactions to mitigate the spread of SARS-CoV-2 precipitated a dramatic shift to telepractice. By October 2020, almost 75% of SLPs who responded to the ASHA survey indicated that they delivered services via telepractice. However, about 50% of respondents reported that they could not provide necessary services to those who needed them (ASHA 2020 October survey, ASHA, 2020c). At the time of this article, most schools and clinics in the United States have resumed in-person schedules, and many SLPs have returned to providing in-person services. Still, given the precedent for remote services established during the COVID-19 pandemic, it is likely that telepractice will retain an essential role in SLP service delivery. In a recent survey of pediatric SLPs in the United States ($n = 269$), Campbell and Goldstein (2022) reported that 87% of respondents predicted that they would continue to provide telehealth in the future. Many reported an increase in confidence in delivering telepractice services during the pandemic. Thus, understanding the current evidence base surrounding telepractice with children who use AAC and children from CLD backgrounds is particularly relevant.

Telepractice in AAC Service Delivery

While the COVID-19 pandemic spurred a near-universal shift from in-person speech-language pathology services to telepractice, a recent survey of SLPs who worked with children who use AAC during the early months of the pandemic, revealed substantial disparities in clinicians' experiences and perceptions of the effectiveness of their services. Biggs et al. (2022) surveyed over 300 U.S.-based SLPs about their experiences working with children (ages 3–21 years) who used aided AAC from May to June 2020 and used mixed methods to analyze factors that influenced the perceived effectiveness of their services and attitudes toward telepractice in AAC service delivery. The authors found that SLPs' perspectives varied based on a variety of factors including workplace setting (e.g., school-based vs. nonschool-based), child and family variables (e.g., child age, motivation, and communication needs, family availability, and comfort with technology) as well as external factors (e.g., policies, funding, and access to technologies). While the experiences of SLPs were mixed, this research underscored the clear potential benefits and opportunities of telepractice to improve service delivery for children who use AAC while acknowledging the need for efficacy research in the area of AAC and telepractice.

Empirical research in AAC and telepractice is growing and there is mounting support for using telepractice to train and coach interventionists (caregivers, staff, and clinicians) who work with children who use AAC in early intervention contexts and school settings. Communication partner training is a fundamental aspect of AAC intervention (Kent-Walsh et al., 2015; Shire & Jones, 2015). Furthermore, gaining caregiver buy-in for AAC and incorporating AAC into naturalistic settings such as home and school is critical to successful communication outcomes (Fäldt et al., 2020; Romski et al., 2015). Telepractice is a promising strategy to efficiently and effectively train communication partners to support and implement AAC outside the therapy room. Although preliminary, several studies have demonstrated the efficacy and feasibility of AAC training via telepractice employing various techniques such as asynchronous training videos with parents of school-age children (Anderson et al., 2014), synchronous video conferences with family members for a 4-year-old child and teaching staff in a high school (Carnett et al., 2021; Douglas et al., 2021), and in vivo coaching using Bluetooth earpieces with the caregiver of an 11-year-old child (Boisvert et al., 2012). While overall, these studies supported the fidelity and feasibility of telepractice to train communication partners of preschool and school-age children on AAC strategies, Anderson et al. (2014) also investigated parents' perspectives of a tele-AAC training program via semistructured interviews. Parents in their study reported that telepractice was more convenient than in-person therapy, especially for those in rural areas. Telepractice increased their direct involvement with their child's communication, and it facilitated the inclusion of other family members (e.g., siblings) in the intervention. However, parents also described drawbacks to telepractice, noting technological difficulties, and feeling overwhelmed with the responsibility of being their child's primary interventionist.

Most of the available research in telepractice and AAC has used an indirect approach, targeting communication partner training. Less research, however, has employed a direct therapy model for tele-AAC—implementing child-directed AAC intervention through telepractice. However, in a single case study of a 7-year-old child who used aided AAC, Hall et al. (2014) compared the child's language outcomes across on-site and telepractice sessions. Their study showed no effect on communication outcomes across the session formats, indicating that direct telepractice may be a viable and effective option for children who use AAC. Although emerging evidence supports telepractice in AAC, few studies include children or families from CLD backgrounds. For these families, additional considerations may be necessary to provide culturally responsive services.

Telepractice With Clients From CLD Backgrounds

Cohn (2012) created the Telepractice Bill of Rights for Consumers, which provides a standard for client expectations for speech and language services delivered via telepractice. These standards include the expectation for culturally responsive services, specifically "a client who receives speech-language pathology or audiology services via telepractice has the right to expect that their clinician...has knowledge of clients' cultural and linguistic backgrounds and how these relate to treatment via telepractice" (p. 14). However, limited research has examined the feasibility and efficacy of SLP telepractice with families who speak a language other than English (Edwards-Gaither, 2018). In a 2014 systematic review, Contant et al. found only two articles investigating telepractice with CLD populations that met their inclusion criteria. In these studies, telepractice consisted primarily of parent consultation and education. A key benefit was that the families could receive intervention services in their home language via a bilingual SLP who was not in their geographic location. Challenges to telepractice included funding for equipment and reimbursement of services, Internet connectivity issues, and lack of experience with technology. More recently, Yllades et al. (2021) used a single-case, multiple-probe design across participants to investigate the effect of parent coaching via telepractice for children (ages 3–6 years) with autism spectrum disorders from Latinx backgrounds. Results of this study indicated increased intervention outcomes for parents and children, providing initial support for a culturally responsive parent-coached telepractice intervention.

Despite early studies demonstrating the efficacy of telepractice for families from CLD backgrounds, little research has examined the opinions and perspectives of families, and research concerning the experiences and needs of SLPs is lacking (Edwards-Gaither, 2018). In a 2017 survey of Spanish-speaking caregivers of bilingual children (ages 1–18 years), Fitton et al. found that almost half of their sample indicated an interest in telepractice, although most had limited experience with the modality. Increased interest in telepractice services was associated with parental interest in Spanish language support for their children and if their child had a speech and language disorder. In another recent study, Yang et al. (2021) conducted focus groups with families from diverse backgrounds to explore their perceptions of telepractice for early intervention services, including advantages, disadvantages, and logistical challenges to implementation. While most participants indicated a preference for in-person therapy over telepractice, they noted benefits to telepractice, including increased opportunities for coaching and training of family members in early intervention strategies and improved communication between providers and families. Together, these findings indicate that, despite the

costs, for underserved populations including children from CLD backgrounds, telepractice may increase access to speech and language services and support parent collaboration and engagement.

This Study

The COVID-19 pandemic highlighted disparities in services for children and families from minoritized backgrounds who were also disproportionally affected by COVID-19 (Macias Gil et al., 2020; Tai et al., 2021). The pandemic magnified existing inequities in access to health care, child care, and digital technologies and Internet services, inflicting a significant economic and psychological toll on communities of color (Fortuna et al., 2020; Hibel et al., 2021). However, it is unclear how changes in service delivery due to the COVID-19 pandemic affected SLP services and outcomes for emergent bilinguals who use AAC and their families, who are a particularly vulnerable population. While telehealth can be an effective platform for providing SLP services across various populations, no known research exists about its effectiveness for emergent bilinguals who use AAC. To better understand the impact of the COVID-19 pandemic and the potential benefits and challenges of telepractice for emergent bilinguals who use AAC, we conducted a national survey of U.S.-based SLPs. We posed the following research questions: (a) How did the COVID-19 pandemic affect SLP assessment and intervention services provided to emergent bilinguals who use AAC, and how did these services change over the course of the pandemic? (b) For emergent bilingual children who use AAC, how did changes in service delivery (from in-person to telepractice) influence child outcomes and provider–family collaboration? (c) Which factors impacted intervention outcomes and family collaboration/engagement for emergent bilinguals who use AAC?

Method

Survey Development

An anonymous online survey was developed to collect descriptive information about SLPs' perspectives, practices, and perceived confidence in providing AAC services to emergent bilinguals who use AAC and to investigate how the COVID-19 pandemic affected service provision for this population. This study focused on a subset of questions related to the COVID-19 pandemic; however, the overall survey development is described below.

Survey questions were based on a literature review of bilingualism and AAC and early reports describing how the disruption in services due to the global COVID-19 pandemic impacted children with disabilities. To provide

feedback on the survey questions, an expert panel composed of nine SLPs with specialized knowledge in AAC services for emergent bilinguals reviewed an initial version of the survey and provided feedback on the content and respondent experience. Five expert panel members had a PhD and were in academic positions, and four were master's level clinicians with clinical and teaching positions. Members of the expert panel were provided with a rating and comment form and were asked to rate (using a 5-point scale) 12 statements about the survey. These statements related to whether the survey would sufficiently address the research questions and evaluated the content of the survey questions and instructions (e.g., depth, breadth, appropriateness, and clarity). Panel members were also encouraged to provide written comments along with each rating. The qualitative and quantitative feedback from the expert panel was compiled and informed revisions and refinements of the survey. The revised version was pretested by three speech-language pathology graduate students who provided feedback regarding the survey experience (length of time, clarity of instructions, and questions).

The final survey consisted of six sections containing multiple-choice questions, text entry questions, and matrix tables with select all that apply or Likert-style ratings. The survey sections included (a) five screening questions, (b) 20 demographic information questions, (c) 14 perspectives questions, (d) 13 practices questions, (e) six confidence questions, and (f) seven questions related to the impact of the COVID-19 pandemic. Screening questions verified whether respondents were eligible to participate in the study (e.g., over 18 years of age and a licensed SLP or SLP Clinical Fellow in the United States or Puerto Rico) and asked respondents to confirm that they provided clinical services to emergent bilingual children who used AAC. Data from the demographic and impact of COVID-19 sections were used to address this study's research questions. These questions are included in Supplemental Material S1. The demographic questions gathered information about SLPs' workplace and work experience (e.g., types of workplace settings, years of speech-language pathology experience, state in which they were licensed to practice). Respondents were also asked to report their age, gender, race and ethnicity, and proficiency and experience speaking languages other than English. Caseload characteristics were also queried, including the total number of children and the number of children who were emergent bilinguals who used AAC on their caseload. When considering the emergent bilinguals on their caseload who used AAC, respondents also reported the languages spoken by these children, their ages, and the characteristics of their AAC systems. The demographic questions also asked about respondents' prior training experience in multilingual and multicultural service provision in general and specific to AAC.

The COVID-19 questions included six matrix-style multiple-choice questions and one open-ended question. The first two questions asked respondents to indicate the type of assessment and intervention services (e.g., in-person, telepractice, hybrid) they provided to emergent bilinguals who used AAC across three time points: Prior to the COVID-19 pandemic ("Prior to March 2020"), March to July 2020, and August 2020 to Spring 2021. Additional questions asked respondents to select (from a list of options) the challenges they and their clients experienced related to AAC assessment and intervention across the three time points. Challenges related to assessment and intervention were queried separately, and respondents could indicate additional challenges not listed using an open response option. To assess how the COVID-19 pandemic impacted intervention outcomes for this population, respondents were asked to indicate whether, overall, their clients who were emergent bilinguals who used AAC met their intervention goals across the three time points using a 5-point scale from "never" to "always." In a multiple-choice question, respondents also indicated whether, due to the COVID-19 restrictions, collaboration with the families of their clients who were emergent bilinguals who used AAC increased, decreased, remained the same, or ceased. The final question was an open-ended question prompting respondents to share their experiences providing services during the COVID-19 pandemic to clients who were emergent bilinguals who used AAC.

Procedure

The study received approval from an institutional review board at Utah State University. Following the screening questions, SLPs were presented with an informed consent page and were notified that choosing to continue the survey indicated their wish to participate. SLPs who participated in the survey could do so at any location and time of their choosing during the data collection period. Target participants were SLPs or SLP Clinical Fellows who (a) were licensed to practice in the United States or Puerto Rico and (b) at the time of the survey worked with emergent bilinguals who used AAC. The survey was created using the Qualtrics Survey Platform and was open for completion for 60 days from January to March 2021. Survey access was limited to one use per respondent, and fraud and bot-detection features of Qualtrics were implemented. Upon completing the survey, participants could elect to access a separate survey link to provide contact information to receive a $10 Amazon gift card for participating in this study. Personal information collected via this particular link was not connected to survey responses. Potential participants were recruited via social media, electronic mailing lists, and direct e-mail. First, an announcement containing a link to the survey was posted on six private SLP/AAC

Facebook groups and was shared on personal Facebook pages and Instagram stories by four AAC specialists who have large social media followings. Second, researchers shared the announcement and survey link on two forums for assistive technology professionals and SLPs and three ASHA Special Interest Group (SIG) online communities (SIG 12: AAC, SIG 14: Cultural and Linguistic Diversity, SIG 16: School-Based Issues). Following recommendations for Internet survey strategies from Dillman et al. (2008), a second announcement was posted in the Facebook groups and electronic mailing lists after 3–4 weeks. Third, researchers e-mailed administrators from local and regional school districts, universities, and clinics and asked them to disseminate the survey link. Finally, appeals to personal contacts via e-mail provided additional advertising regarding the availability of the survey. A total of 255 people responded to the survey. A total of 76 did not pass the screening questions and an additional 19, who passed the screening questions, only partially completed the survey. Ultimately, 160 SLPs completed the survey in its entirety (89% completion rate), and these data were used in the analysis.

Participants

Of the 160 SLPs who completed the survey, 148 (92.5%) were ASHA certified, 11 (6.9% were Clinical Fellows, and one (0.6%) was state-licensed only. Table 1 summarizes respondent demographic information, including participant gender, race/ethnicity, age, workplace setting, and geographic location. Most participants (93.1%) identified as women and White (81.9%), and half (50.0%) were in the 25- to 35-year-old age range. The SLPs surveyed worked in various clinical settings (e.g., school, clinic, university, hospital, home health, early intervention), although most (75.6%) reported that they sometimes, often, or always worked in a school. Participants represented 27 different states, most practicing in urban and suburban areas (88.8%). The average number of years participants had been in the profession was 10.6 years ($SD = 9.09$), with experience ranging from less than 1 year to 40 years. Participants also indicated the languages they spoke other than English and their level of proficiency in each language. Two thirds of respondents ($n = 108$) reported speaking one or more languages other than English, with varying proficiency.

Participant Caseload Characteristics

Table 2 summarizes the caseload characteristics of the SLPs surveyed. We gathered information about their emergent bilingual clients who used AAC including the AAC systems used by the clients and the languages spoken. Most respondents (64.4%) had over 40 participants

Table 1. Participant demographics by gender, race/ethnicity, age, languages spoken, workplace setting, geographic region, and location.

Characteristic	Participants n	%
Gender		
Female	149	93.1
Male	8	5
Nonbinary	1	0.6
Race/ethnicity		
White/Caucasian	131	81.9
Black or African American	1	0.6
Hispanic or Latinx	25	15.6
Asian[a]	8	5
Other[b]	3	1.9
Age		
Under 25 years	3	1.9
25–35 years	80	50
35–44 years	41	25.6
45–54 years	25	15.6
55–64 years	10	6.3
Languages spoken[c]		
American sign language	2	1.3
French	2	1.3
Polish	2	1.3
Spanish	57	35.6
Other	8	5.2
Workplace setting[d]		
School	121	75.6
Clinic	42	26.9
Private practice	31	19.7
University or research setting	11	7.1
Rehabilitation/habilitation facility	17	11
Hospital	19	12.3
Home health	23	14.8
Early intervention/birth–3 services	41	26.1
Geographic region		
New England	9	5.7
Mideast	5	3.1
Southeast	24	15.1
Great Lakes	25	15.8
Plains	4	2.5
Southwest	12	7.5
Rocky Mountains	41	25.8
Far West	41	25.8

Note. $N = 160$. Totals for each domain may not equal 160 participants (100% response rate) due to nonreporting of data and/or the option to select multiple answers for race/ethnicity, languages spoken, and workplace setting.

[a]Asian subcategories included East Asian ($n = 4$), South Asian ($n = 1$), Southeast Asian ($n = 2$). [b]Jewish, Native American/Indigenous, Pacific Islander. [c]Languages included in the table were those that participants reported they spoke with advanced or superior proficiency, or they were a native speaker of the language. The "other" category includes: Cantonese, Chinese, German, Japanese, Mandarin, Tagalog, Tamil, and Telugu. [d]n varied by workplace setting due to question type: school $n = 160$, clinic $n = 156$, private practice $n = 157$, university or research setting $n = 155$, rehabilitation/habilitation facility $n = 155$, hospital $n = 155$, home health $n = 155$, early intervention/birth–3 services $n = 157$.

on their caseload during an average calendar year. While all respondents worked with at least one emergent bilingual who used AAC, 53.1% reported that they currently worked with between three and 10 children who were

Table 2. Description of participants' clients who were emergent bilinguals who used augmentative and alternative communication (AAC).

Characteristic	Participants	
	n	%
# of clients on caseload who were emergent bilinguals who used AAC		
1–2	45	28.1
3–5	56	35
6–10	29	18.1
11–20	13	8.1
21–30	9	5.6
More than 30	8	5
AAC systems used by clients		
AAC device or mobile technology with vocabulary and voice output in English only	95	59.4
AAC device or mobile technology with vocabulary and voice output in their home language only	18	11.3
AAC device or mobile technology with vocabulary and voice output in both English and their home language	110	68.8
Low-tech AAC system with vocabulary in English only	86	53.8
Low-tech AAC system with vocabulary in their home language only	37	23.1
Low-tech AAC system in both English and their home language	89	55.6
Languages spoken by clients[a]		
Amharic	6	3.8
Arabic	40	25
Chinese	30	18.8
French	9	5.6
German	6	3.8
Hindi	13	8.1
Hmong	12	7.5
Korean	11	6.9
Portuguese	11	6.9
Russian	11	6.9
Spanish	153	95.6
Tagalog	13	8.1
Vietnamese	25	15.6
Other	17	10.7
Age of clients[b]		
0–2 years	28	17.8
3–5 years	98	62
6–11 years	121	75.6
12–21 years	86	54

Note. *N* = 160. Totals for each domain may not equal 160 participants (100% response) due to nonreporting of data and/or the option to select multiple answers for AAC systems used by client, languages spoken by clients, and age of clients.

[a]Other languages reported by four or fewer participants: Armenian, Bengali, Bulgarian, Burmese, Cape Verdean, Chuukese, Creole, Danish, Farsi, Greek, Gujarati, Haitian Creole, Hebrew, Hungarian, Italian, Karen, Khmer, Kinyarwanda, Lithuanian, Macedonian, Malayalam, Mandarin, Mixtec, Mongolian, Nepali, Non-Hindi languages from India, Non-Hindi South Asian languages, Persian, Polish, Romanian, Somali, Swahili, Tamil, Telugu, Tigrinya, and Urdu. [b]Includes participants who "sometimes," "often," or "always" worked with clients in these age groups, *n* varied due to missing data: 0–2 years *n* = 158, 3–5 years *n* = 158, 6–11 years *n* = 160, 12–21 years *n* = 159.

emergent bilinguals who used AAC. From a list of options, respondents also selected the types of aided AAC systems used by the emergent bilinguals on their caseloads. Most indicated that they used AAC devices or mobile technology with vocabulary and voice output in both English and the client's home language (68.8%). Respondents indicated that these clients spoke 49 languages, with Spanish being the most frequently selected language (95.6% of respondents), followed by Arabic (25.0%), Chinese (18.8%), Vietnamese (15.6%), Tagalog (8.1%), and Hindi (8.1%). The remaining 42 languages were selected by less than 8% of respondents. Most respondents indicated that the emergent bilinguals on their caseloads were school-aged with 75.6% reporting that they sometimes, often, or always worked with 6- to 11-year-olds and 54.0% indicating that they worked with 12- to 21-year-olds.

Data Analysis

Descriptive analyses (averages, frequencies, and percentage responses) summarized respondents' demographic and caseload information. Further descriptive analyses were conducted using bar charts to assess raw counts of responses, Sankey diagrams ("flow charts") to investigate changes over time (from prior to COVID-19 to Spring 2021) for categorical outcomes (e.g., modality of assessments, modality of interventions, barriers to service delivery), and line graphs to understand change over time for counts of responses. Due to limitations of other techniques (e.g., the McNemar test), nonparametric chi-square tests were used to test for significant changes between time points for each categorical outcome (i.e., service delivery type, barriers to service delivery, child and family outcomes). Although not ideal with repeated measures, chi-square is valuable here to assess changes with minimal assumptions. Nonparametric Kruskal–Wallis rank sum tests were used to test for relationships between SLP demographic and caseload factors and child and family outcomes, given the child and family outcomes were ordinal measures (ranging from rarely to always) and the SLP and caseload characteristics were independent groups. The quantitative analyses were performed in R version 4.1.0 (R Core Team, 2021). All data, code, and output of the quantitative analyses are provided at https://osf.io/sx3nf/.

We used thematic analysis (Braun & Clarke, 2006) to qualitatively examine participant responses to the final, open-ended question, which asked participants to elaborate on their experience providing AAC services to emergent bilinguals during the COVID-19 pandemic. Eighty-one participants responded to this open-ended question and their responses were imported to NVivo (QSR International Pty Ltd, 2020), a qualitative analysis program. Two of the authors then separated the data into

thought units to assign each segment its own code (Fraenkel, 2006; Vaughn et al., 1996). Thought units were defined as "the minimum meaningful utterance having a beginning and end" (Hatfield & Weider-Hatfield, 1978, p. 46), and further operationalized as a simple sentence or independent clause containing an idea that stands alone. Typically, these thought units corresponded with a sentence; however, when a sentence included more than one idea, the resulting thought units were phrases. Thought units were given context in brackets when only a portion of a sentence was extracted. This process resulted in 234 thought units.

All data were coded in NVivo using an inductive structured coding process (Saldaña, 2013) to allow for presentation of the participant voices and to reduce researcher bias through reflexivity (Cresswell & Poth, 2018). In the first coding cycle, the first and second authors read through the comments at least 3 times and determined a provisional list of codes. The second author coded the text using this provisional coding scheme. The first and second authors then refined and grouped the codes into themes and subthemes and developed definitions for these codes and themes (see Supplemental Material S2). The second coding cycle was a consensus cycle. The first and second authors and two undergraduate research assistants, trained in the coding protocol, recoded the text together using the provisional coding scheme as a guide. During this second coding cycle, focused coding methods were used to categorize the data and identify themes (Braun & Clarke, 2006), and final coding decisions were made through intensive group discussion. Ultimately, five broad themes were extracted: (a) barriers, (b) outcomes related to change in service delivery, (c) descriptive factors, (d) future implications and recommendations, and (e) unclear or other.

Results

Impact of the COVID-19 Pandemic on AAC Services for Emergent Bilinguals

The first research question asked how the COVID-19 pandemic affected speech-language pathology assessment and intervention services for emergent bilinguals who use AAC. We examined reported changes in assessment and intervention services for this population and barriers to service delivery throughout the pandemic. Qualitative analyses provided additional detail related to the nature of these barriers. SLPs reported the format of service delivery for emergent bilinguals who use AAC across three time points: before the pandemic shutdowns (prior to March 2020), during the early phase of lockdowns (March 2020 to July 2020), and during the first school year when many COVID-19 restrictions were lifted across the country

(August 2020 to Spring 2021). Figure 1 describes the pandemic-driven changes in assessment and intervention service delivery for these clients. The bars are stacked bars (much like in a stacked bar chart, with the *y*-axis representing the number of SLPs) while the colored lines show proportions of SLPs and whether they change from one time point to another. For instance, of the few SLPs using hybrid delivery for assessment prior to March 2020, many used multiple delivery options during March to July 2020 and the remaining SLPs used telepractice. Chi-square tests indicated significant changes between time points, for both assessment, $\chi^2(10) = 374.5$, $p < .001$, and intervention, $\chi^2(10) = 392.0$, $p < .001$. Prior to March 2020, most SLPs we surveyed indicated that they provided in-person assessment (92%) and intervention (94%) services to their clients who were emergent bilinguals who used AAC. From March to July 2020, approximately one-third of these shifted to telepractice or hybrid for assessment, and over half provided telepractice or hybrid intervention. From August 2020 to Spring 2021, most SLPs provided hybrid or telepractice assessment and intervention services, with a few shifting to in-person. Notably, more SLPs in our survey reported that they discontinued assessment services from March to July 2020 (31%), compared to intervention (only 15%). However, by August 2020, most SLPs had resumed services in some capacity, with only 12% and 4% still discontinuing assessment and intervention services, respectively.

Barriers to Service Delivery

SLPs also indicated AAC assessment and intervention challenges for their emergent bilingual clients by identifying barriers to service provision across the three time points. While assessment and intervention barriers were prevalent before the pandemic (20 indicated 3+ barriers for assessment and 15 for intervention) the frequency of SLPs reporting three or more barriers to assessment and intervention increased substantially during the initial phase of the pandemic (36 and 33, respectively) and remained high (43 and 35, respectively). Figure 2 provides additional detail regarding the specific barriers SLPs selected across the time points including: lack of/limited Internet, language barrier, limited funding for therapy and/or AAC, technology barriers, and other barriers. For assessment, lack of/limited Internet increased significantly during the initial phase of the pandemic and remained high, $\chi^2(2) = 24.3$, $p < .001$, with technology barriers possibly showing a significant increase as well, $\chi^2(2) = 5.45$, $p = .066$. For intervention, both lack of/limited Internet and technology barriers increased significantly, $\chi^2(2) = 34.6$, $p < .001$ and $\chi^2(2) = 13.2$, $p = .001$, respectively, during the initial phase of the pandemic and remained high.

Barriers to service delivery were also a key theme that emerged from the qualitative analysis with 97 (41.5%)

Figure 1. Sankey diagram showing the flow of changes to service delivery over time, stratified by assessment services and intervention services. The bars are stacked bars (much like in a stacked bar chart, with the y-axis representing the number of speech-language pathologists [SLPs]) and the colored lines show the flow from each time point to the next. For instance, of the few SLPs using hybrid delivery for assessment prior to March 2020, many used multiple delivery options for March to July 2020 and the remaining used telepractice.
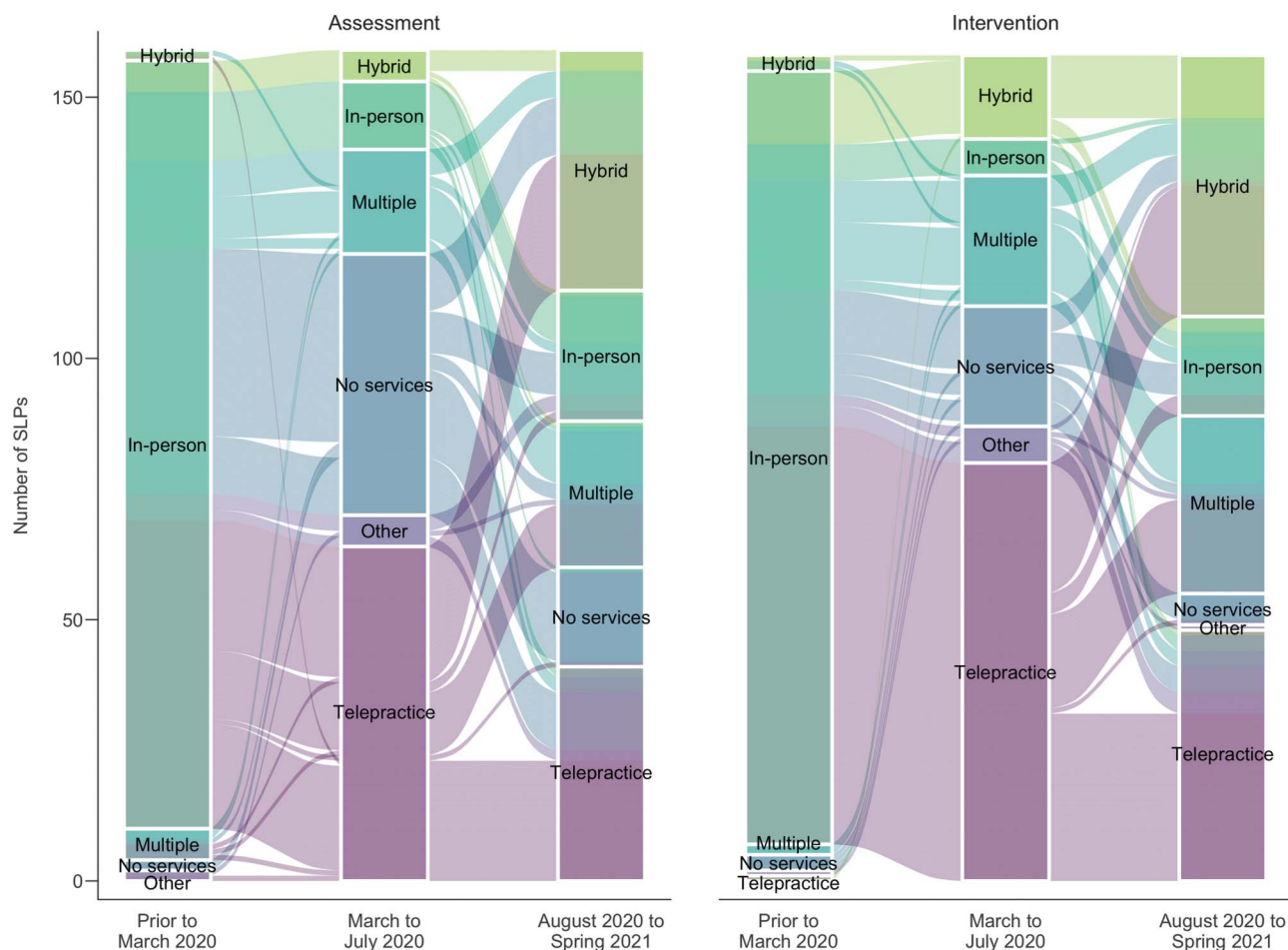
thought units relating to various barriers. Some of these barriers corresponded to those queried in the choice matrix, while others provided new insights. Within the barriers theme, 11 subthemes were created including: (a) assessment-specific challenges due to COVID-19, (b) financial barriers, (c) general barriers related to AAC tech or resources for CLD populations, (d) insufficient time for the clinician, (e) Internet or technology barriers, (f) lack of caregiver availability or involvement, (g) lack of caregiver follow-through, (h) lack of in-person interaction/difficulty of telepractice, (i) lack of provider education or training in bilingual AAC, (j) language and interpreter difficulties, and (k) other barriers (mentioned by only one participant or general statements of difficulty). Except for the "other barriers" category, the most frequently reported barriers subthemes were "lack of in-person interaction/difficulty of telepractice" (16 mentions) and "lack of caregiver availability or involvement" (14 mentions). Table 3

includes a list of these barriers with example responses and frequencies.

Changes in Service Delivery and Child and Family Outcomes

Research Question 2 considered how shifting service delivery from in-person to telepractice influenced child therapy outcomes and provider-family collaboration. We used quantitative and qualitative analyses to address this question. Using a 5-point scale from "never" to "always," we asked respondents to report whether their emergent bilingual clients who used AAC met their intervention goals across the three time points. Overall, outcomes decreased over time, with responses of "always" and "often" decreasing from prior to March 2020 to March to July 2020 time points, $\chi^2(2) = 6.7$, $p = .003$ and $\chi^2(2) = 106.0$, $p < .001$. Responses to "rarely" and "sometimes"

Figure 2. Line graph showing changes in frequency (observed frequency stated in graph near each point) of individual barriers across time, stratified by assessment services and intervention services. AAC = augmentative and alternative communication.
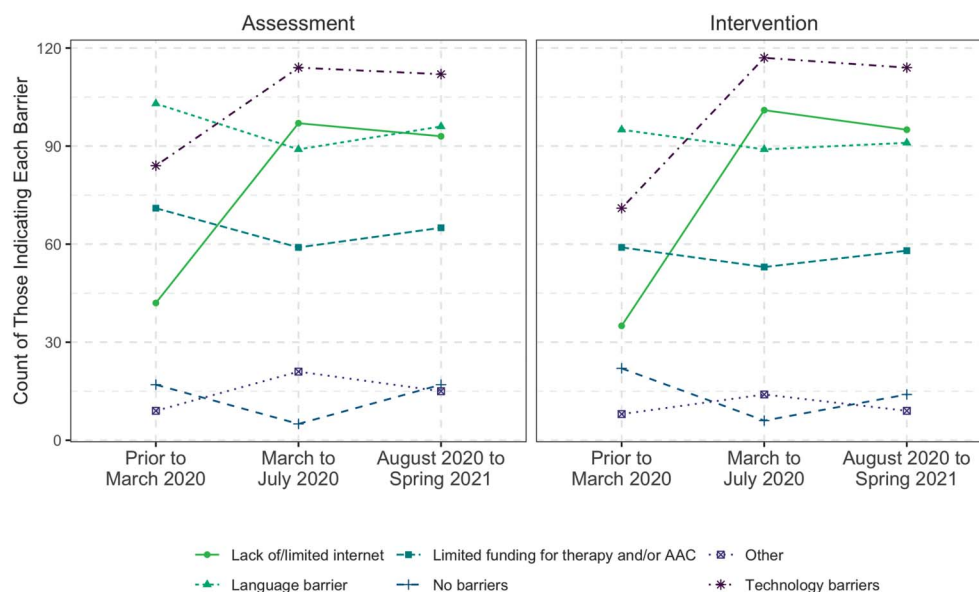
mirrored that of "always" and "often," $\chi^2(2) = 76.0$, $p = .003$ and $\chi^2(2) = 61.2$, $p < .001$, each showing increases. Furthermore, from March to July 2020 to August 2020 to Spring 2021, there were significant increases of "often" and "sometimes," $\chi^2(2) = 43.4$, $p < .001$ and $\chi^2(2) = 69.8$, $p < .001$, while "rarely" decreased $\chi^2(2) = 45.9$, $p < .001$.

We then compared responses for client outcomes from SLPs who reported using telepractice from March to July 2020 compared to those who did not. As portrayed in Figure 1, by March 2020, approximately half of SLPs in our survey reported using telepractice with their emergent bilingual clients who used AAC. Figure 3 shows how child outcomes varied, stratified by whether the SLPs were using telepractice or not from March to July 2020. Similar to Figure 1, Figure 3 diagrams the number of SLPs (*y*-axis) reporting each outcome and how these changed over time. For example, for the no telepractice group, those "always" meeting goals prior to March 2020 were mostly continuing to achieve "always" while a portion moved to "sometimes." Both groups showed significant changes, $\chi^2(6) = 32.9$, $p < .001$ and $\chi^2(6) = 50.1$, $p < .001$. Those that did use telepractice showed decreases in outcomes; however, the trend for those who did not use telepractice from March to July 2020 had a larger decrease in outcomes from March to July, with many having clients "rarely" meeting goals. Both those that used telepractice and those that did not had similar improvement patterns between March to July 2020 and August 2020 to Spring 2021. That is, from August 2020 to Spring 2021, SLPs reported an increase in clients "often" meeting their goals and a decrease in clients "rarely" meeting

their goals, although outcomes did not improve to prepandemic levels for either group.

In addition to reporting on their clients' intervention goals, we also asked respondents to indicate whether, due to the COVID-19 restrictions, collaboration with the families of their clients who were emergent bilinguals who used AAC increased, decreased, remained the same, or ceased. Almost half (46%) reported that collaboration increased, 24% said collaboration remained the same, 27% indicated a decrease, and 1% reported that collaboration ceased.

Qualitative analyses allowed us to further explore the nuances in child and family outcomes reported by our respondents. Seventy-four (31.6%) respondents thought units were coded under the broad theme "outcomes related to change in service delivery," for which we created six subthemes. These subthemes included (in order of frequency): (a) increased collaboration or engagement, (b) improved outcomes for the child, (c) service providers adapting and innovating, (d) diminished outcomes for the child, (e) decreased collaboration or engagement, and (f) increased understanding of the home environment. Descriptions of the most frequently occurring subthemes are included below, and additional frequencies and examples for the remaining subthemes can be found in Table 3.

The most frequently recurring subtheme, "increased collaboration and engagement" (38 mentions), was defined as increased collaboration, engagement, involvement, or education with the family or team due to telepractice. For example, one participant noted, "Although there were barriers...my district's requirement to try telehealth services

Table 3. Coding categories and examples of responses to the question, "Are there any other comments you would like to make about your experience providing services during the COVID-19 pandemic to your clients who are emergent bilinguals who use AAC?"

| Codes	Examples of responses	*n*	%
Barriers		**97**	**41.5**
Other barrier	School setting felt practically impossible.	26	11.1
Lack of in-person interaction, Difficulty of telepractice	Due to camera view, I am then unable to see the AAC and support child in use.	16	6.8
Lack of caregiver availability or involvement	During remote learning they are not home to get child on the Internet.	14	6.0
Language and interpreter difficulties	With some of the families, who have very limited English proficiency, I am finding it harder to access interpreters and ensure that I am giving them all the information they need.	10	4.3
Internet or technology	Biggest barrier has been lack of Internet service and/or data caps for mobile users.	7	3.0
Lack of caregiver follow-through	Even though I trained my two families in person and sent videos and AAC books to use with the device, it was too overwhelming for them to include the use of it in everyday activities at home without support.	7	3.0
General barriers related to AAC tech or resources for CLD populations	So far, the limited availability of AAC options in other languages besides Spanish has been limited.	5	2.1
Assessment-specific challenges or changes due to COVID-19	Due to COVID-19, the county does not or has slowed down offering AAC assessments.	4	1.7
Financial	More funding is also needed from insurance companies.	3	1.3
Insufficient time for clinician	How much time can you spend outside of work hours to train in AAC, counseling for it, learning the client's language enough to provide services in it, and give the rest of your caseload the same attention?	3	1.3
Lack of provider education or training in bilingual AAC	I don't have the knowledge on how to support this one student I have.	2	0.9
Outcomes Related to Change in Service Delivery		**74**	**31.6**
Increased collaboration and engagement	When I was working in the schools (up until December), there was increased engagement with families due to the necessity of caregivers being present for distance learning.	38	16.2
Improved outcomes for child	Child's use of the AAC device has increased.	12	5.1
Service providers adapting and innovating	I started focusing less on the actual goal (production of 2 + words, navigation, etc.) and focused more on parent coaching	12	5.1
Diminished outcomes for child	Very few of my students have been using their aided AAC systems at all since the pandemic/distance learning, most have used residual speech skills and unaided means to participate or have taken on a very receptive role in their education.	5	2.1
Decreased collaboration and engagement	Some families had decreased participation due to work schedule conflicts, having multiple children engaging in online learning, etc.	4	1.7
Increased understanding of home environment	The transition to providing telehealth services was overall productive to allow me as the clinician to get a glimpse into the child/family's home life.	3	1.3
Future Implications and Recommendations	A hybrid model can possibly work where parent interview, and observations could be done virtually. However, implementation of probes and device setup is best done in person.	**6**	**2.6**
Descriptive Factors Related to Service Delivery	Our students are typically in school this year, but speech-language services are mostly remote.	**20**	**8.5**
Unclear or Other	It is important to be aware, educated, and prepared to promote effective communication in this unprecedented time.	**37**	**15.8**

Note. *n* = 153. Total meaningful units = 234. Boldfaced data indicate totals for the broad codes. AAC = augmentative and alternative communication; CLD = culturally and linguistically diverse.

only facilitated more collaboration, as I was virtually entering my students' homes on a weekly basis." Another participant said, "I have found that with some families, there has been increased involvement and acceptance of supporting home language (since their child is always in the home)."

The subthemes "improved outcomes for the child" and "service providers adapting and innovating" both received 12 mentions. The first of these subthemes was

defined as any response that described increased, better, or enhanced outcomes for the child due to the change in service delivery compared to outcomes before the COVID-19 pandemic. The most reported improvements in child outcomes included increased AAC device use and maintenance of skills. This subtheme is reflected in comments such as, "they [the families] in turn have become more comfortable working with their child's communication device" and "[the] child's use of the AAC device has increased." Five

Figure 3. Sankey diagram showing the flow of student outcomes across time, stratified by whether the speech-language pathology (SLP) used telepractice from March to July 2020. The bars are stacked bars (much like in a stacked bar chart, with the *y*-axis representing the number of SLPs) and the colored lines show the flow from each time point to the next. For example, for the "no telepractice" group, those always meeting goals prior to March 2020 were mostly continuing to achieve always, but some moved to sometimes.
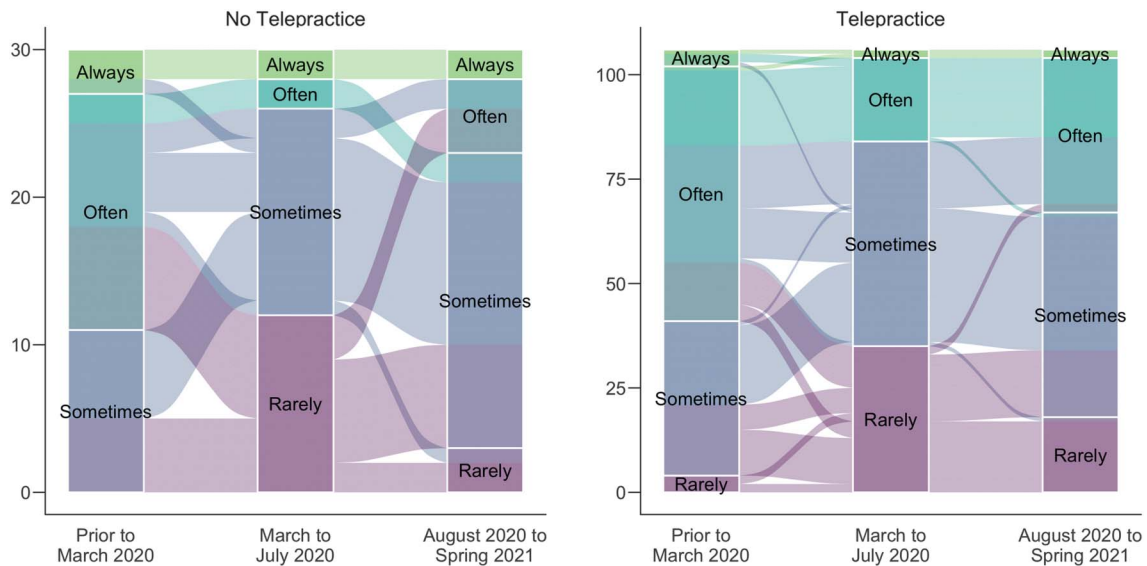
participants noted that these improvements were due to collaboration with the child's family. For example, "for those parents who can attend regular virtual meetings and do the work at home, collaboration between SLP and parents have increased, and the child has been able to maintain AAC skills." The subtheme "Service providers adapting and innovating" was defined as adaptations or innovations made to assessment and/or intervention procedures, and materials, effectuated by the restrictions of the COVID-19 pandemic. For example, one participant noted, "I have learned a lot about adapting how I model and teach AAC in a telepractice environment." Another observed, "I started focusing less

on the actual goal (production of 2+ words, navigation, etc.) and focused more on parent coaching."

Predictors of Child and Family Outcomes

Our final research question examined relationships between SLP demographic and caseload factors and child and family outcomes using Kruskal–Wallis rank sum tests (see Table 4 and Table 5). Investigated variables included SLP bilingual status, training in service provision for children from CLD backgrounds, service delivery format (in-person, telepractice, hybrid, no services), and caseload

Table 4. Relationships between demographic and caseload characteristics with child and family outcomes.

	Able to meet goals March to July				Able to meet goals August to Spring 2021			
Characteristic	**Rarely** *n* = 48	**Sometimes** *n* = 63	**Often or always** *n* = 27	*p* value	**Rarely** *n* = 28	**Sometimes** *n* = 74	**Often or always** *n* = 48	*p* value
Speaks or understands any language in addition to English	38 (79%)	37 (59%)	18 (67%)	.076	21 (75%)	50 (68%)	31 (65%)	.600
Received prior training in multicultural/ multilingual service provision	42 (88%)	55 (87%)	26 (96%)	.400	23 (82%)	65 (88%)	46 (96%)	.150
Types of intervention services provided to emergent bilinguals who use AAC between March and July 2020?								
In-person	2 (4.2%)	4 (6.3%)	10 (37%)	< .001	4 (14%)	20 (27%)	19 (40%)	.058
Telepractice	30 (62%)	42 (67%)	18 (67%)	.900	16 (57%)	40 (54%)	22 (46%)	.600
Hybrid (in-person and telepractice)	7 (15%)	9 (14%)	6 (22%)	.600	12 (43%)	34 (46%)	20 (42%)	.900
No services	13 (27%)	9 (14%)	3 (11%)	.130	7 (25%)	1 (1.4%)	0 (0%)	< .001

Note. Reported statistics are *n* (%). *p* values are from Kruskal–Wallis rank sum tests. AAC = augmentative and alternative communication.

Table 5. Relationships between demographic and caseload characteristics with collaborations with families.

Characteristic	Collaboration with families			
	Ceased or decreased $n = 46$	Increased $n = 74$	Remained the same $n = 38$	p value
Speaks or understands any language in addition to English	38 (83%)	43 (58%)	25 (66%)	.021
Received prior training in multicultural/multilingual service provision	42 (91%)	62 (84%)	36 (95%)	.200
Frequency of work with various age groups				
Ages 0–2 years				.026
Always	0 (0%)	1 (1.4%)	1 (2.6%)	
Often	4 (8.7%)	1 (1.4%)	3 (7.9%)	
Sometimes	10 (22%)	6 (8.1%)	2 (5.3%)	
Rarely	7 (15%)	9 (12%)	9 (24%)	
Never	25 (54%)	56 (76%)	22 (58%)	
Ages 3–5				.200
Always	3 (6.5%)	7 (9.5%)	2 (5.3%)	
Often	11 (24%)	22 (30%)	9 (24%)	
Sometimes	14 (30%)	15 (20%)	13 (34%)	
Rarely	9 (20%)	14 (19%)	7 (18%)	
Never	9 (20%)	15 (20%)	6 (16%)	
Ages 6–11 years				.500
Always	5 (11%)	13 (18%)	9 (24%)	
Often	12 (26%)	27 (36%)	9 (24%)	
Sometimes	16 (35%)	17 (23%)	11 (29%)	
Rarely	3 (6.5%)	4 (5.4%)	4 (11%)	
Never	10 (22%)	13 (18%)	5 (13%)	
Ages 12–21 years				.120
Always	1 (2.2%)	9 (12%)	2 (5.3%)	
Often	9 (20%)	24 (32%)	6 (16%)	
Sometimes	12 (26%)	12 (16%)	10 (26%)	
Rarely	11 (24%)	9 (12%)	7 (18%)	
Never	13 (28%)	20 (27%)	12 (32%)	
Type of intervention services provided to emergent bilinguals who use AAC between March and July 2020?				
In-person	5 (11%)	3 (4.1%)	8 (21%)	.019
Telepractice	24 (52%)	52 (70%)	24 (63%)	.140
Hybrid (in-person and telepractice)	7 (15%)	4 (5.4%)	11 (29%)	.003
No services	15 (33%)	17 (23%)	4 (11%)	.057
Type of intervention services provided to emergent bilinguals who use AAC between August 2020 and Spring 2021?				
In-person	10 (22%)	19 (26%)	14 (37%)	.300
Telepractice	20 (43%)	46 (62%)	15 (39%)	.035
Hybrid (in-person and telepractice)	16 (35%)	36 (49%)	17 (45%)	.300
No services	7 (15%)	1 (1.4%)	2 (5.3%)	.010

Note. Reported statistics are: n (%). p values are from Kruskal–Wallis rank sum tests. AAC = augmentative and alternative communication.

characteristics (total caseload size, age of emergent bilingual clients who use AAC). Outcome variables included whether children met their intervention goals during the March to July 2020 and August 2020 to Spring 2021 time points and overall family collaboration outcomes. Results revealed that from March to July 2020, in-person service provision was significantly associated with whether children met their intervention goals. However, from August 2020 to Spring 2021, service delivery formats were not significantly associated with child outcomes unless no services were provided. There were no significant associations between SLP demographic factors and caseload characteristics and child outcomes during either time point.

There was a significant relationship between SLPs' bilingual status and family collaboration outcomes (whether collaboration increased, remained the same, decreased, or ceased). Bilingual SLPs were more likely to report that family collaboration increased during the pandemic. The frequency that the SLPs served children ages 0–2 years was associated with family collaboration. SLPs who indicated they never provided AAC intervention to emergent bilingual children ages 0–2 years were also more likely to report that family collaboration increased during the pandemic. No other age groups were associated with family collaboration. The type of intervention service was also significantly associated with family collaboration outcomes across both time points. For instance, SLPs who provided in-person or hybrid services from March 2020 to July 2020 were most likely to report that collaboration with the family remained the same. Family collaboration was also

significantly associated with telepractice service provision from August 2020 to Spring 2021 (more likely to have increased collaboration).

Discussion

This study used quantitative and qualitative analyses, mixed at the point of interpretation to examine the impact of the COVID-19 pandemic on changes and challenges to service delivery for emergent bilingual children who use AAC. We explored how a widespread shift to remote service delivery influenced child and family outcomes for this population. Results of our investigation revealed a sizable change from in-person service provision to telepractice or hybrid service delivery for emergent bilinguals who use AAC. Respondents to our survey reported that the pandemic exacerbated barriers to AAC service delivery for this population, heavily influenced by technology and Internet-access challenges. Overall, child intervention outcomes declined during the pandemic regardless of service delivery format, although family collaboration largely increased. Increased family collaboration was associated with a younger caseload and with bilingual respondents.

Persistent Barriers and Challenges to Service Provision

Findings from this survey reveal the serious impact of the COVID-19 pandemic on AAC service provision for emergent bilinguals. While this research did not directly compare service delivery and outcomes for monolingual versus bilingual children who use AAC, the results suggest that, as in other areas of health care, the pandemic exacerbated barriers to services for bilingual families (e.g., Macias Gil et al., 2020; Tai et al., 2021). Qualitative analyses further illuminated barriers to service provision resulting from pandemic-specific restrictions as well as barriers that appear to be systemic. Our findings made clear that even before the pandemic, service providers faced multiple barriers to delivering AAC services to emergent bilinguals. These challenges included language barriers and limited funding for therapy and AAC equipment. Many qualitative responses further described persistent obstacles to service provision, reflecting a dearth of empirical research and a lack of professional training and resources. It remains clear that the pandemic exacerbated disparities in AAC services for emergent bilinguals.

Telepractice and Child and Family Outcomes

The finding that child intervention outcomes decreased overall during the pandemic is not surprising given the substantial barriers described by our respondents. The trend analysis indicates that many SLPs who initially switched to telepractice reported that their clients did not frequently meet their intervention goals during the early phase of the pandemic as many families were reeling after the abrupt shutdowns, and service providers were scrambling to adapt and initiate telepractice services. However, after several months, many providers who switched to telepractice or hybrid services reported improved outcomes, presumably, as they became more familiar with remote service delivery and as families had more time to adapt. It is also possible that, for many SLPs, the goals set for clients prepandemic did not translate well to the remote service delivery model. This mismatch in goals may also have contributed to the abrupt decline in outcomes reported during the early phase of the pandemic. Presumably, the improvement in outcomes during the August 2020 to Spring 2021 time points was influenced by SLPs adjusting their goals to better align with a telepractice model. Overall, however, our results suggest that regardless of service delivery format, child outcomes did not improve to prepandemic levels even 10 months into the pandemic. This finding underscores the significant detrimental impact of the pandemic on the communication outcomes of emergent bilingual children who use AAC.

One key finding was that almost half of SLPs reported increased collaboration with families of emergent bilinguals who used AAC. While a substantial group of our survey respondents reported that collaboration remained the same or decreased, it is notable that for many, remote service delivery provided new opportunities to engage and connect with families. Also noteworthy is that significant effects for increased family collaboration were not found for any age groups, except for SLPs who did not provide services to children ages birth to 2 years for whom parent-coaching and training is a primary intervention model (Romski et al., 2015). Before the pandemic, research in telepractice and AAC was gaining slow but steady traction, although research with bilingual families was minimal. Results from this survey indicate that telepractice may provide novel avenues to provide AAC partner coaching and intervention strategies for some providers and families although efficacy research is needed.

It is also well established that family buy-in is critical for successful AAC implementation. Training and coaching families in AAC partner communication strategies is vital for this process. SLPs may educate families about AAC options and potential outcomes. Still, they must also work with families to understand their goals and values surrounding their child's communication and their perspectives toward AAC and telepractice technologies. Several studies have found that families from CLD backgrounds may be reluctant to embrace AAC technologies, especially if they lack language-specific features and

culturally relevant vocabulary and symbols (Huer et al., 2001; Joginder Singh et al., 2017; McCord & Soto, 2004). Despite these challenges, our survey revealed that telepractice might increase collaboration opportunities with families of emergent bilinguals who use AAC. Several SLPs observed that telepractice improved family-centered service provision by understanding the families' home life. Others noted that they would attempt to retain a hybrid model to maintain the collaboration even after in-person restrictions were lifted. However, it is essential to note that not all SLPs reported successful collaborations during the pandemic and that outcomes were highly varied and dependent on individual client and SLP circumstances. This variability in outcomes underscores the necessity of an individualized, family-centered intervention model that is tailored to address families' unique needs, priorities, values, and resources. Nonetheless, this research suggests that for families of emergent bilinguals who use AAC, telepractice or hybrid services may be a promising option to ultimately provide more culturally responsive family-centered care.

The finding that collaboration increased for some families is in line with conclusions from Biggs et al. (2022). In a survey of SLPs providing AAC services via telepractice during the early phase of the pandemic, the authors found that many SLPs reported increased family collaboration following the switch to telepractice. Furthermore, the authors observed that often the distinction between consultative and direct services blurred as many providers found themselves collaborating with family members during direct teletherapy sessions. In our study, we also found that SLPs who were bilingual reported increased family collaboration compared to monolingual SLPs. Prior research indicates that bilingual SLPs reported increased self-efficacy when working with families from CLD backgrounds, compared to monolingual SLPs (Santhanam & Parveen, 2018). This increased self-efficacy has been linked to providers' ability to relate to their clients by building a collaborative, trusting relationship. While language homophily between provider and client does not always equate to improved client outcomes (Lor & Martinez, 2020), a shared cultural and linguistic background can build rapport, which is a key element to therapeutic success (Akamoglu et al., 2018).

Limitations and Future Directions

The survey results are limited by the sample, which was a convenience sample of SLPs who reported providing AAC services to emergent bilingual children. Thus, our findings may not represent all SLPs, as many providers do not offer AAC services, even if their clients may benefit from AAC interventions (Moorcroft et al., 2019). Compared to the broader population of U.S.-based SLPs

(ASHA, 2021a, 2021b), our sample also skewed younger, more bilingual, and included SLPs who already worked with emergent bilinguals who used AAC. These SLPs may have had a higher interest in AAC and were potentially more familiar with technologies including aided AAC and telepractice. Due to our Internet-based recruitment strategy, it was also not possible to calculate a response rate for this survey thus limiting the generalizability. Furthermore, our research described SLPs' (retrospective) perspectives of their experiences with service provision to emergent bilinguals who use AAC. Families' views, experiences, and needs are critical to fully understanding the impact of the COVID-19 pandemic on service provision and the advantages and disadvantages of telepractice. Regarding the effect of the COVID-19 pandemic on service provision for this population, our study does not provide a clear indication of how many clients were excluded from telepractice because parents were unable to attend therapy sessions or for other reasons. Our survey asked respondents to answer questions based on their caseload. However, it is essential to note that their clients' experiences varied greatly for many SLPs. Respondents may also have had varying interpretations of what telepractice encompasses which may have influenced their responses. In addition, qualitative descriptions for the response options "always," "often," "sometimes," and "never" were not provided. Quantitative analyses were limited in some cases by the response patterns (e.g., little variance in some items) and ability to handle categorical variables. As such, nonparametric statistics were used throughout.

Future research is required to identify factors that contribute to positive telepractice outcomes and increased collaboration for families of emergent bilingual children who use AAC. Most providers switched to telepractice during a time of crisis, thus more research is needed to examine the outcomes of telepractice beyond the pandemic as well as how different models of telepractice (hybrid, synchronous, and asynchronous) may support family participation and child outcomes differentially. Lack of training in telepractice and in providing bilingual AAC services was a key barrier that emerged from our study, emphasizing the immediate need for increased graduate and continuing education training in telepractice as well as in culturally and linguistically responsive AAC assessment and intervention. Furthermore, administrative and policy changes are necessary to address barriers surrounding resources and funding for various forms of telepractice that account for the additional provider time required to provide training and counseling and programming in AAC, particularly for families from diverse linguistic backgrounds. Many respondents also described barriers in access to AAC services for families of emergent bilingual children who use AAC. Addressing inequities in access to telepractice as well as AAC options that are

culturally and linguistically responsive should be prioritized by expanding high-speed Internet access, mobile technology access, and increasing the aided AAC options that support multilingual communication.

Conclusions

The COVID-19 pandemic caused immense disruption in service provision for children with communication impairments. Findings from our survey illustrate the impact of this disruption for a subset of these children, emergent bilinguals who use AAC, from the perspective of SLP service providers. While this research did not directly compare service delivery and outcomes for monolingual versus bilingual children who use AAC, the findings suggest that, as in other areas of health care, the pandemic exacerbated barriers to services for bilingual families. At the same time, results from this survey indicate that for some providers and families, telepractice may provide novel avenues to implement AAC partner coaching and intervention strategies. Although more research is needed, the results of our study suggest that for families of emergent bilinguals who use AAC, telepractice or hybrid services may be a promising option to ultimately provide more culturally responsive family-centered care.

Author Contributions

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