

Educators' experiences and reflections on the implementation of evidence-based practices for autistic students in public schools during the COVID-19 pandemic

Implementation Research and Practice

Volume 4: Jan-Dec 2023 1–12

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DOI: 10.1177/26334895231189197

journals.sagepub.com/home/irp



Alyssa M. Hernandez¹ , Olivia Michael², Gabriella Canning², Mahima Joshi², Anthony Osuna³ and Jill Locke² 

Abstract

Introduction

In 2020, the COVID-19 pandemic forced many schools to close their doors and transition to remote learning, disrupting how autistic students received school-based services and support. While school structure changes were challenging for all students, autistic students were uniquely affected, considering their reliance on predictability and routine; moreover, education settings are where most autistic children receive services. Much has been studied regarding the use of evidence-based practices (EBPs) for autistic students in traditional school settings, yet little is known about how educators use EBPs in remote learning environments in the wake of the COVID-19 pandemic.

Method

In this study, we explore educators' experiences with EBP implementation at the height of the pandemic and educators' reflections of its impact on autistic students and their school systems. Qualitative data were collected from 81 educators (general educators, special educators, and paraeducators) in semi-structured interviews regarding EBP use at the onset of the pandemic.

Results

Four themes emerged from interviews: (1) pandemic and remote learning environment challenges to inclusion and EBP use; (2) EBP use adaptations for remote learning environments; (3) pandemic and remote learning environment benefits for EBP use; and (4) considerations for EBP use beyond the pandemic.

Conclusion

These findings elucidate educators' experiences using EBPs during the COVID-19 pandemic and highlight important areas of consideration for autism-focused EBP implementation as remote instruction continues to be a learning format. More research is needed to understand how to best implement EBPs for autistic students in this emerging instruction context.

Plain Language Summary: The COVID-19 pandemic forced many schools to shift to remote or hybrid learning, which impacted how autistic students received school-based services. School settings are where most autistic children receive support and accommodations. Evidence-based practices (EBPs) are strategies shown by high-quality research to support

¹Department of Psychology, University of Pennsylvania, Philadelphia, Pennsylvania, USA

²Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, Washington, USA

³Center for Child Health, Behavior and Development, Seattle Children's Research Institute, Seattle, Washington, USA

Corresponding author:

Jill Locke, Department of Psychiatry and Behavioral Sciences, University of Washington, 6200 NE 74th Street, Suite 110, Seattle, Washington, USA 98115-6560.

Email: jjlocke@uw.edu.



autistic children, and there are strong efforts to increase the use of EBPs in schools. While much is known about how autism-focused EBPs are used in traditional classroom settings, little is known about how these practices are used in remote learning environments. This paper explored educators' experiences using EBPs at the height of the pandemic and educators' reflections of its impact on autistic students and their school systems. Interviews with general educators, special educators, and paraeducators revealed important information. There were pandemic-specific and remote learning environment challenges to inclusion and EBP use. Many educators reported making adaptations to EBPs when instruction was pivoted to remote learning. While there were challenges to remote instruction, there were also pandemic- and remote learning environment-related benefits for EBP use. Educators also reflected on considerations for EBP use beyond the pandemic, including more educator training opportunities to support EBP use in remote settings. Considering the rise in remote and hybrid learning settings, future research should explore how to support educators, autistic students, and their caregivers in remote setting EBP use.

Keywords

autism, remote learning, evidence-based, educators/teachers, COVID-19, educational/school, service system

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by challenges in social communication and restricted and repetitive patterns of behaviors and interests (American Psychiatric Association, 2013). As the prevalence of autism continues to increase (1 in 36 youth in the United States; Maenner et al., 2023), there is a growing need for effective interventions. Schools are the primary service system in which autistic children receive intervention, with 1 in 81 school-aged children meeting special education eligibility (Safer-Lichtenstein et al., 2020). In accordance with the Individuals with Disabilities Education Act (IDEA, 2004), schools must provide education in the least restrictive environment; therefore, many autistic children are partially or fully included in general education settings (Majoko, 2016) in addition to receiving special education services and supports (Autism Speaks, 2022). There have been significant efforts to increase the implementation of evidence-based practices (EBPs), defined as practices shown by high-quality research to have meaningful effects on student outcomes (Cook & Odom, 2013; Stahmer et al., 2014); however, EBPs have been inconsistently adopted, implemented, and sustained in school settings (Brock et al., 2019; Brookman-Frazee et al., 2011; Hess et al., 2007).

There are many potential barriers that make successful EBP implementation in schools difficult. For certain EBPs, intervention structure, complexity, and training (Stahmer et al., 2014) make implementation challenging for educators with limited time. This, combined with large class sizes, finite resources (e.g., staff, technology, and space), time constraints, and required curriculum, makes it increasingly onerous for educators to shift focus to the use of autism-focused EBPs (Barry et al., 2020; Mandell et al., 2013; Wilson & Landa, 2019). Research has also identified how factors such as individual attitudes toward EBP training, social influences, commitment to

training, and expectations contribute to the use of EBPs in the classroom (Locke et al., 2019; Lyon et al., 2013). In addition, organizational factors, such as leadership and administrative support, have also played a role in the implementation of EBPs (Aarons et al., 2015; Ehrhart et al., 2014). Given these factors, teachers often report combining or modifying focused EBPs to meet the needs of their autistic students, which may affect fidelity (Dickson et al., 2021; Stahmer et al., 2005). While a significant body of literature is dedicated to EBPs for autistic students, most of this research predates the COVID-19 pandemic.

In the spring of 2020, the COVID-19 pandemic forced many schools into abrupt closures. School districts responded in various ways based on location, infrastructure, resources, socioeconomics, and community needs (Brooks et al., 2020; Reich et al., 2020). While school buildings were closed, much of education was shifted to virtual or remote learning, and educators were forced to suddenly revise their teaching methods (Mohan et al., 2020). There were various challenges and disruptions to providing an appropriate education, including limited access to the required technology, applications, technology skills, or internet connectivity to participate in remote instruction (Spain et al., 2021). Many teachers reported challenges in providing meaningful educational experiences to all their students (Merrill, 2020) as students struggled at home with social isolation and loneliness (Brooks et al., 2020). These changes were difficult for all students, but autistic students were uniquely vulnerable due to their reliance on predictability, routine, structured supports, and educational accommodations (Eshraghi et al., 2020; Pellicano & Stears, 2020; Spain et al., 2021).

Despite significant changes to the educational environment, schools were still expected to meet the requirements of IDEA (2004). Educators continued holding Individualized Education Program (IEP) meetings, conducting assessments, and providing intervention services (Womack & Monteiro, 2022).

However, many of the EBPs commonly used to support autistic students (e.g., physical prompting, social skills training, etc.) were challenging to implement remotely (Hume et al., 2021; Hurwitz et al., 2021). Little is known about how educators used EBPs during this time. In a study of 106 educators from 40 school districts in Indiana, teachers reported several changes to IEPs and EBPs, including reduced service minutes, adjusted goals, reduced goal difficulty, altered progress monitoring, and elimination of social goals (Hurwitz et al., 2021). Educators reflected that adapting EBPs during the pandemic was overwhelming, required innovation, and benefited from collaboration with caregivers (Hurwitz et al., 2021). More research is needed to understand how educators provided EBPs to autistic students during the height of the pandemic and future EBP implementation in an ever-changing postpandemic world.

The consequences of the pandemic on schools and EBP use continue to impact autistic students. Some schools have adopted a hybrid or fully remote structure (Denkman et al., 2022). In Washington State, some school districts offer ongoing options for remote learning and are experiencing waitlists and high demand for remote learning alternatives (Jadran, 2022). The pandemic and remote learning exacerbated service utilization (Manning et al., 2020; Neece et al., 2020) and resulted in both challenges (i.e., loss of academic support, services, and programming; Neece et al., 2020) and benefits (i.e., no social pressures of in-person school; Lugo-Marín et al., 2021; Reicher, 2020) for autistic students. The reliance on remote learning calls for the continued understanding of barriers to and facilitators of the use of autism-focused EBPs (Brookman-Frazer et al., 2011; Hess et al., 2008). In this paper, we describe educators' experiences with EBP implementation at the height of the pandemic and educators' reflections of its impact on autistic students and their school systems. Using semi-structured interview data from a mixed-methods study, we explored the following research questions:

1. During the height of the pandemic, what was autism-focused EBP implementation like in inclusive general education settings?
2. What have we learned about remote EBP implementation from educators' reported experiences?

Analysis of these data can provide insights into how EBPs may be utilized in remote learning environments to support the inclusion of autistic children and elucidate educators' perceptions of remote learning environment's impact on autistic students.

Method

This study occurred as part of a larger federally funded project that examined which EBPs general and special education teachers and paraeducators have heard of, been trained in, and used to include and retain autistic children in general education settings (Locke et al., 2021). This study was funded at

the onset of the COVID-19 pandemic, which led to rich and unprompted semi-structured interview data regarding the pandemic and remote EBP implementation.

Educators and Setting

The authors aimed to capture a broad range of perspectives on using EBPs in general education settings to achieve data saturation (Tipton & Miller, 2022). A free web-based tool, <https://thegeneralizer.org>, was used to obtain a representative sample of Washington State schools. The target sample was intended to infer to Washington State schools from kindergarten-fifth grade (K-5), with representative balance based on school characteristics (size, percentage of free and reduced lunch, gender, race, and urbanicity/rurality) and district characteristics (number of schools, percentage of English Language Learners, percentage of language at home, English only, and urbanicity/rurality). The generalizability index is a score between 0 and 1, with 1 indicating that the sample is the same as the population on the characteristics described above and a 0 indicating that the sample and population share no common features (Tipton, 2014). The final recruited sample achieved a generalizability index score of 0.92 for Washington State (considered very high) and 0.78 for the U.S. population of schools (considered high). In total, 56 schools in 28 districts were invited to participate. Approximately 126 interest forms from school educators were received. Educators were screened per established criteria: (1) identified as a general education teacher, special education teacher, or paraeducator; (2) supported an autistic student who participates in a general education setting (i.e., any setting during the school day in which an autistic student interacts with their neurotypical peers) at least 15 min per day; and (3) worked in a Washington State public elementary school.

One hundred and four interested educators who met the criteria were sent the study survey via a Qualtrics™-generated hyperlink. Eighty-six educators from 50 schools from 24 districts in Washington State completed surveys. Of the educators who completed the survey, 81 educators from 49 schools from 23 districts completed the follow-up interview used in this study; five educators declined or did not respond to the interview invitation.

Educator Demographics and School Characteristics

Educator Demographics

Table 1 presents descriptive information on interviewed educators. A total of 81 educators were interviewed across three roles: general educators ($n = 26$), special educators ($n = 31$), and paraeducators ($n = 24$) who supported at least one autistic student in a general education setting between grades K-5. Most educators were between the ages of 35

Table 1
Educator Demographics

	<i>n/M</i>	<i>%/SD</i>
<i>n</i>	81	100
Educator role		
General education teacher	26	32.1
Special education teacher	31	38.3
Paraeducator	24	29.6
Sex		
Female	76	93.8
Male	5	6.2
Age (years)		
25–34	21	25.9
35–44	27	33.3
45–44	18	22.2
55–64	14	17.3
65–74	1	1.2
Ethnicity		
Latinx	0	0
Race ^a		
White	69	85.2
Asian	3	3.7
Multiracial	8	9.9
Education		
High school diploma	5	6.2
Associate degree	4	4.9
Bachelor's degree	26	32.1
Master's degree	46	56.8
Years in current position	6.4	4.8

^aMultiracial breakdown: 1. White, Black or African American, and American Indian/Alaskan Native, 2. White, Asian, and Pacific Islander, 3. White and Asian, 4. White and American Indian/Alaskan Native, 5. White and Black or African American.

and 44 ($n=27$, 33.3%) and had an average of 6.4 years in their current position ($SD=4.8$). Sex distribution was 93.8% female ($n=76$) and 6.2% male ($n=5$). Educators self-identified as Asian ($n=3$, 3.7%), White ($n=69$, 85.2%), or multiracial ($n=8$, 9.9%). No educators identified exclusively as Black, Native American, or Hawaiian/Pacific Islander. No educators identified as Latinx.

School Characteristics

Table 2 presents descriptive information from the National Center for Education Statistics (NCES, 2022) on the 49 schools of interviewed educators. Over half of the schools ($n=27$) were considered Title 1. The average number of students served per school was approximately 399 ($SD=139.6$) and ranged from 67 students to 664 students at the time of the study. On average, these schools served approximately 67 ($SD=27.3$) students with disabilities (range 17–142 students).

Procedures

Recruitment

The University of Washington's Institutional Review Board (IRB) approved the study. When applicable, school district IRB approval was obtained. We contacted school

Table 2
School Demographics

	<i>n/M</i>	<i>SD/%</i>	Min.	Max.
School ($n=49$)				
Title I school wide	27	55	—	—
<i>n</i> Students	398.7	139.6	67	664
Sex				
Female	193.3	68.2	37	299
Male	204.7	72.3	30	356
Ethnicity				
Hispanic/Latinx of any race(s)	79.2	71.6	3	412
Race				
American Indian/Alaskan Native	3.2	3.7	0	23
Asian	26.1	28.7	0	133
Black/African American	23.1	38.8	0	169
Native Hawaiian/Other Pacific Islander	5.1	8.3	0	47
Two or more races	38.6	23.2	0	99
White	223.5	110.8	17	485
Other characteristics				
Low income	163.8	93.2	10	401
Students with disabilities	67.3	27.3	17	142
Services				
Section 504	7.1	6.2	0	24

district officials to obtain a list of elementary schools that have enrolled autistic children who are partially or fully included in a general education setting and then contacted school principals via email. Approximately 358 school principals were emailed. Subsequently, the research team distributed all recruitment materials (e.g., flyers and consent materials) to general and special education teachers and paraeducators. Before participation, the research team provided a full description to all educators of study procedures and activities included in study participation and obtained informed consent via an electronic form.

Survey Measures

Upon consent, educators were asked to complete an online survey that included a modified Autism Treatment Survey (ATS; Hess et al., 2007) and demographic items. The ATS was modified to include practices that have been identified as evidence-based for autistic students since its publication according to the National Professional Development Center on Autism (NPDC; Steinbrenner et al., 2020). To develop a set of EBPs used to support inclusion of autistic children in general education settings, we used explicit criteria for exclusion of EBPs from the NPDC review—EBPs could not: be assessments (e.g., functional behavior assessment), be implemented only outside of schools (e.g., parent-implemented), or require EBP-specific certification (e.g., Sensory Integration TherapyTM). The authors' examination of the NPDC list with the outlined criteria led to the removal of seven EBPs from the final EBP list. The criteria and the final set of evidence-based multi-component practices and strategies were reviewed with an

external autism intervention researcher. Twenty-one EBPs from the 28 listed in the NPDC were included. Multicomponent EBPs included antecedent-based interventions, direct instruction, discrete trial training, functional communication training, peer-mediated instruction and intervention, naturalistic intervention, self-management, social narratives, and social skills training. Evidence-based strategies included augmentative and alternative communication, behavioral momentum intervention, extinction, modeling, prompting procedures, reinforcement, response interruption/redirection, task analysis, technology-aided instruction and intervention, time delay, video modeling, and visual supports.

The online survey included the updated EBP definitions and examples that align with the NPDC (Hugh, 2020) for educators to reference as they completed the survey. The list and definitions of 21 evidence-based strategies and multicomponent practices queried are displayed in Table 3. The survey asked educators to select EBPs they used to support the inclusion of autistic students. After completion, the educators ($n=86$) were invited to an audio-recorded semi-structured interview (30–45 min) at a convenient time for the educator (via Zoom™). Of this group, 81 completed a follow-up interview. As an incentive for their participation, educators were offered a \$40 gift card and a resource kit of materials to use with autistic children (e.g., Velcro, visual timers, visual supports, sensory toys, fidgets, etc.).

Semi-Structured Interview

We developed a systematic and comprehensive interview guide with questions that explored EBP use from their survey responses (see Supplemental Materials). Questions were carefully constructed to elicit clear information without assigning valence to EBP use. We asked each educator about inclusion (e.g., *Tell me what inclusion means to you.*), EBPs broadly (e.g., *What do you think would make evidence-based practices and strategies more acceptable to educators?*), and specific questions about two to four EBPs from their survey (e.g., *What are the reasons you decided to use [insert practice/strategy] for a specific autistic student?*). To achieve saturation across EBPs heard of, trained in, and use frequency, we selected each educator's EBPs based on the following decision guide: one practice that they had been trained in but did not use, one practice and one strategy that they used frequently regardless of training, and one practice or strategy that was rarely used regardless of training. When necessary, interviewers provided educators EBP definitions and examples. Interviews were approximately 25–45 min long. Note, we did not specifically ask about the impacts of the COVID-19 pandemic or remote instruction.

Three team members were trained by the principal investigator to conduct qualitative interviews. Four team members conducted interviews. Interviews were conducted from October 2020 to June 2021. Audio and visual media

were recorded following the educator's verbal consent. Following the interview, interviewers uploaded audio media to Rev.com for transcription. Interviewers reviewed transcripts for accuracy, scanned transcript text to confirm validity to audio recording, provided clarity around inaudible segments, and removed identifiable transcript text (e.g., name of school, district, city, etc.).

Data Analysis

Survey Analysis

Summary statistics (i.e., count, percentage, mean, and standard deviation) were calculated for the educator demographics and educational characteristics.

Semi-Structured Interview

For the larger study, six team members, including the principal investigator, postdoctoral fellow, research coordinator, and research assistants, independently coded seven transcripts randomly selected across educator roles to identify codes and met as a group to discuss recurring codes. A codebook was developed with operational definitions and examples of when to use and not use the code. An integrated approach to coding was used as certain codes were conceptualized during the interview guide development (i.e., deductive approach), and other codes were developed through a close reading of the initial set of transcripts (i.e., inductive approach; Bradley et al., 2007). The coding scheme was refined throughout the data analytic process (Bradley et al., 2007).

Following the development of a stable codebook, three coders coded 10 randomly selected transcripts to achieve interrater reliability. After achieving an initial reliability of 95.1%, coders independently coded the remaining transcripts, overlapping on 20% of randomly selected transcripts to assess drift (drift reliability was 95.5%). To capture data complexity, avoid errors, reduce groupthink, and circumvent some researcher biases, a consensus process was used in which all reviewers independently coded reliability transcripts and met to compare their coding to arrive at consensus judgments through open dialogue (DeSantis & Ugarriza, 2000; Hill et al., 1997; Hill et al., 2005). The inductive thematic saturation approach was used to determine when there were no new emerging codes or themes, meaning data saturation has been reached (Saunders et al., 2017). Coders used NVivo™ computer software package for qualitative data analysis.

Remote Instruction and Virtual EBP Implementation during the COVID-19 Pandemic. One of the codes developed through a close reading of the initial set of transcripts (i.e., inductive approach; Bradley et al., 2007) was "COVID-19 Pandemic." The "COVID-19 Pandemic" code was defined as "any mention of remote instruction or the COVID-19 pandemic."

Table 3
Evidence-Based Practices and Definitions

Practice	Definition
Antecedent-based interventions	Modifying the environment to decrease an identified interfering or inappropriate behavior and increase engagement.
Functional communication training	A positive behavior support intervention designed to reduce problem behaviors by replacing them with meaningful or functional communication, whether verbal or gestural.
Naturalistic intervention	A specific collection of practices including environmental arrangement, interaction techniques, and behavioral strategies designed to encourage specific target behaviors based on learners' interests by naturally reinforcing them.
Peer-based instruction and intervention	Explicitly training peers to provide social learning opportunities through interaction, modeling, and reinforcement as a way to improve social reciprocity in more natural social contexts.
Self-management	Teaching learners to discriminate between appropriate and inappropriate behavior, accurately monitor and record their own behaviors, and reward themselves for appropriate behavior or use of skill.
Social narratives	A description of social situations for learners by providing relevant cues, explanation of the feelings and thoughts of others, and descriptions of appropriate behavior expectations.
Social skills training	A specific form of group or individual instruction designed to teach learners ways to appropriately interact with peers, adults, and other individuals.
Direct instruction	A systematic approach to teaching using a sequenced instructional package with scripted protocols or lessons that employ systematic and explicit error correction procedure.
Discrete trial training	A one-to-one instructional approach used to teach skills in a planned, controlled, and systematic manner. It often is characterized by repeated, or massed, trials that have a definite beginning and end.
Augmentative and alternative communication	Teaching the use of a system of communication that is not verbal/vocal including aided (e.g., gestures) and unaided communication systems (e.g., exchanging objects, using a technological device).
Behavioral momentum intervention	The organization of behavior expectations in a sequence in which low probability, or more difficult, responses are embedded in a series of high probability, or less effortful, responses to increase persistence and the occurrence of the low probability responses.
Differential reinforcement ^a	A systematic procedure for providing reinforcement for desired behaviors, while inappropriate behaviors are ignored.
Extinction	A procedure whereby a behavior that was formerly reinforced is no longer reinforced.
Modeling	A specific demonstration of a desired target behavior that results in imitation of the behavior by the learner and leads to the acquisition of the imitated behavior.
Prompting procedures	Systematic use of supports that provide help to the learner that assists them in becoming independent in using a specific skill.
Reinforcement	Something that is done or provided after a behavior that increases the likelihood that the target behavior/skill will occur again in the future.
Response interruption/redirection	A procedure that involves introduction of a prompt, comment, or other distractors when an interfering behavior is occurring.
Task analysis	The process of breaking a skill into smaller, more manageable steps in order to teach the skill.
Technology-aided instruction and intervention	Instruction or interventions in which technology is the central feature supporting the acquisition of a goal for the learner.
Time delay	A practice that focuses on systematically fading the use of prompts during instructional activities.
Video modeling	A mode of teaching that uses video recording and display equipment to provide a visual model of the targeted behavior or skill.
Visual supports	Concrete supports are used to support a learner's understanding or expression.

Note. Multicomponent EBPs: antecedent-based interventions; direct instruction; discrete trial training; functional communication training; peer-mediated instruction and intervention; naturalistic intervention; self-management; social narratives; and social skills training. Evidence-based strategies: augmentative and alternative communication; behavioral momentum intervention; extinction; modeling; prompting procedures; reinforcement; response interruption/redirection; task analysis; technology-aided instruction and intervention; time delay; video modeling; and visual supports. EBPs = evidence-based practices.

^aDifferential reinforcement of alternative, incompatible, or other behavior.

Results

The authors coded text from 59% of educators ($n = 47$) as the “COVID-19 Pandemic” code. Four basic themes emerged from the coded responses: (1) pandemic and remote learning environment challenges to inclusion and EBP use; (2) EBP use adaptations for remote learning environments; (3) pandemic and remote learning environment benefits for EBP use; and (4) considerations for EBP use beyond the pandemic.

Theme 1: Pandemic and Remote Instruction Environment Challenges to Inclusion and EBP Use

At the height of the pandemic, support centers and resources, such as special education technology centers, experienced cuts to their budgets. Protected educator collaboration and professional development time also were suspended. These budget cuts and loss of protected time impacted educators’ ability to use EBPs. One special educator stated that their use of technology-aided instruction and intervention was negatively impacted because materials, such as iPads, were no longer getting renewed nor were they being serviced. When asked about the acceptability of EBPs more broadly, they emphasized the necessity for protected planning time, which was lacking:

...And all the schools normally in a normal year, every Thursday, we would have a late starting time. And we don’t have that anymore. The district felt like it was easier to have just all the students start at one time, which I get ... I totally get it, but it would be nice to have more planning time because there are a lot of pieces to it all. There’s a lot of people to meet with, and it’s hard to get anybody let alone the ones you need to meet with...

EBPs used to better include children were restricted, inaccessible, and/or difficult to use in a remote learning environment. When asked about the use of a specific EBP, direct instruction, one special educator lamented that while a remote learning environment provided a better setting to work uninterrupted with one student, helpful for direct instruction use, their student would not turn on their screen nor their microphone. Their student “regressed to the point where he was under the table.”

Special education teachers and paraeducators further highlighted the loss of cooperation with general education teachers leading to EBP use challenges as well as lost opportunities for the inclusion of autistic children in general education settings. A special educator said, “I have to really push for inclusion ... I think that they [general education teachers] just haven’t been given enough tools in their toolbox. And then especially now

with our teaching situation, it’s like one more thing in the way.” One paraeducator said there was no communication with general education teachers, “It’s been cut completely ... They [general education teachers and students] don’t even know our students [autistic students] right now.” Educators highlighted EBP feasibility challenges due to seclusion and an inability to collaborate with their colleagues. One special education teacher discussed these challenges as they relate to modeling:

We had kids five days a week where things were a lot easier for us to start to model and to instruct in prior to going and building that scaffolding. And then within that classroom setting, we could see the teachers every single day, we could see results, or we could see no results, either way, we would be able to see whether or not what we were doing was working, tweaking it, seeing results. It’s really hard to do that right now.

Educators also expressed a desire to receive training and feedback on their use of EBPs but described these opportunities as absent in the remote learning context. For example, one general education teacher shared “we are in isolation.” They explained their desire for social narrative guidance, stating it would be helpful “seeing another teacher using a social narrative story with their students, or like seeing the management around how it’s working in another room.”

Theme 2: EBP Use Adaptations for Remote Instruction Environments

Many educators described how they adapted EBPs and made an effort to continue EBP use during the height of the pandemic. While tangible EBP materials, such as token economies, were not accessible for educators teaching virtually, they described pivoting to verbal praise and positive feedback as forms of reinforcement. Educators described making use of Zoom™ features, such as breakout rooms, that aided in EBPs requiring more one-on-one environments, including self-management and direct instruction. One special education teacher described success in using discrete trial training in a remote learning environment with support from parents:

I’m actually doing it [discrete trial training] on Zoom with two of my students because their parents are rockstars. And so I was able to kind of teach them [parents] how to do it.

Overall, educators that continued to use EBPs in their remote learning environments often stated that while it was feasible to use EBPs, it was challenging, and they did not believe it to be as effective as in-person implementation.

Theme 3: Pandemic and Remote Instruction Environment Benefits for EBP Use

Some educators described that both they and their students received technological aids, to be used for technology-aided instruction and intervention, which had been requested for some time but were now given priority. When asked what district-level supports may facilitate social skills training use in a general education classroom, an educator mentioned a pandemic-driven prioritization of students' social learning and abilities. Their district implemented daily "social emotional communication mornings," which included 30 min protected time for social emotional learning. They shared, "...the school district is saying this is important, so it [social emotional learning] does garner official time in our schedule." The general education educator believed district-level changes in priorities may benefit social skills training.

Educators across roles also shared benefits to EBP use related to remote learning environments. Some described their remote learning environment as providing space to use EBPs with students where there is no classroom distraction. One special education teacher, explained, "...we're working individually, we are writing about very abstract things or her interests, where if I was in the classroom with her, like we typically would be, we wouldn't get to have those same conversations."

Theme 4: Considerations for EBP Use Beyond the Pandemic

In spring 2021, some educators described their return to in-person learning environments or hybrid learning environments (i.e., a partial return to in-person school, a few days a week). They discussed their concern over students' regression in social skills and social-emotional well-being, but often they described EBPs as valuable tools in aiding challenges. One paraeducator described regression in students' skills that occurs following periods without in-person school:

...Sometimes when they come back from summer or COVID, the regression was pretty good. So, there's always those ideas [EBPs]. I'm so glad that I've learned those different ideas [EBPs] because I can always go back to it. If I have to make an icon or something, I will go back to that.

Educators also began to discuss the desire for new EBP training opportunities to be better equipped in a remote learning environment. Many described returning to in-person learning will not be returning to what in-person learning was like before the pandemic. While describing EBP use difficulties related to resources and time, one general education teacher said:

I think after this whole pandemic settles a little bit I think it's going to be probably a bit of an opportune time to step in with some different ideas [EBPs] because everyone's going to be starting again. Yeah they're going to be burned out, but it's an opportunity to say, "Okay, this is what we've learned during this time, what worked remotely, what didn't work remotely, how can we meld this together?"

Discussion

In this study, we explored educators' remote use of autism-focused EBPs during the COVID-19 pandemic. Educators provided a rich description of the ways in which they responded to the pandemic and the implementation of autism-focused EBPs in remote learning environments. The qualitative results of this study highlighted four basic themes: (1) challenges to general education inclusion and EBP use during the pandemic; (2) adaptations to EBPs for use in remote settings; (3) pandemic and remote learning environment benefits to EBP use; and (4) considerations for EBP use beyond the pandemic. These data illustrate educators' nascent experiences and methods to incorporate EBPs in remote learning environments.

Educators shared new challenges to inclusion and EBP use that occurred during the pandemic. They highlighted broader district and school pandemic-related challenges, such as resource program cancellations and loss of funding, and unique barriers directly related to remote learning, such as inaccessibility of EBP materials like visual supports at home and decreased opportunities for social engagement (e.g., some educators had to halt the use of peer-mediated instruction entirely). Educators credited remote instruction for increased social isolation for both autistic students (e.g., limited inclusion) and from their colleagues (e.g., lost opportunities for EBP-specific coteaching and coplanning). The remote setting did not allow educators opportunities to collaborate with their teams further limiting EBP implementation. Because remote instruction continues to be an option for many autistic students (Denkman et al., 2022), it is critical to understand best practices in which educators can continue to use EBPs and to collaboratively team around EBP implementation.

While educators shared that some EBP materials (e.g., tokens and tangible reinforcements) were inaccessible and other EBPs were not feasible to implement, educators continued EBP use through innovative adaptations. For example, educators described they were still able to use visual supports as they could "whip something up on the screen really quickly." Other educators found Zoom™ helpful for facilitating video modeling. Consistent with the findings of Hurwitz et al. (2021), educators reported that remote learning also led to an unanticipated opportunity for parents/caregivers to learn EBPs and renewed caregiver-teacher collaboration. This evidence suggests that

the home–school continuum and collaboration may facilitate EBP use. Although, it is important to consider that not all autistic students will have the same support from caregivers (i.e., some parents may not have the resources or time to use EBPs in partnership with educators). Fell et al. (2023) report that telehealth services worked well when caregivers were able to fully engage and attend to video sessions and when autistic clients had more verbal capacity.

Contrary to difficulties presented by the pandemic and remote instruction, educators also acknowledged some benefits prompted by the pandemic and related to remote EBP use. For example, educators found their use of some EBPs, such as direct instruction, was more feasible in a remote learning context. Educators noted that autistic students included in a general education classroom were not distracted by the classroom environment—including distraction from “being othered” as peers could not “pick out the special ed kid from a non-special ed kid.” The option of a hybrid learning environment may provide opportunities for autistic students to access EBPs in private, comfortable, and safe spaces.

Many educators expressed their thoughts on the greater implications of their remote EBP use experiences. They highlighted its potential for making technology-aided instruction and intervention more supported and accepted by school and district leaders. Others noted that district- and school-level investment in social-emotional learning may lead to investment in EBPs such as social skills training and social narratives. Many educators called for training in adaptation and implementation of EBPs in a remote learning environment. Educators needed to quickly pivot to remote instruction at the onset of the pandemic. They were swift to adapt and adjust to remote EBP use, yet no road maps were provided. In particular, there were few opportunities to collaborate or consult with colleagues, attend or adjust to individual students, and evaluate best practice use. Future efforts may consider what EBP delivery looks like now that remote learning will likely remain a commonly used instruction modality, as well as develop training opportunities on how to use autism-focused EBPs remotely.

Limitations

Some important limitations should be considered. First, these data were collected in Washington State and while the generalizability index was representative of Washington State and the broader United States, the generalizability of these findings cannot be guaranteed. Findings are grounded in Washington State COVID-19 policies and public school districts’ transitions between 100% remote, hybrid, and in-person learning. Second, because the larger project began prior to the onset of COVID-19, the semi-structured interview did not include questions specifically aimed at understanding remote learning modalities’ effect on EBP use, nor the exact

context (e.g., fully remote, hybrid, or fully in-person) in which educators were implementing autism-focused EBPs when they were interviewed. On March 15, 2021, Washington State issued an emergency proclamation requiring all public school districts and charter schools to provide an opportunity for all K-12 students to “engage in both remote/online instruction and on-campus/in-person instruction, otherwise known as a hybrid model of K-12 instruction” by April 5, 2021, for all elementary grade students (The Office of the Governor, 2021). Although, it is understood that prior to the Governor’s emergency proclamation, public schools were largely operating between fully remote and hybrid learning modalities, more specific information on the context of remote learning in the fall semester of 2020 may have provided more clarity (Washington State Board of Health, 2021). Future research should be initiated with specific aims at understanding remote EBP implementation for inclusion of autistic children in general education settings with additional data being collected on the changing and nuanced education context.

Future Implications

According to the NCES (2022), all public schools (100%) offered full-time in-person learning by fall 2021, and over one-third (34%) offered remote instruction. In Washington State, multiple large districts launched pilot remote programs and virtual academies. One byproduct of the COVID-19 pandemic has been the possibility of remote learning as an alternative or complementary mode of instruction, which has far-reaching implications for how EBPs may be delivered in the future (e.g., during inclement weather, traumatic events, etc.). In agreement with the findings of Hurwitz et al. (2021), this shift requires adaptations to be made to the way autism-focused EBP materials are designed, implemented, and monitored virtually. As remote learning continues, it is important to take into consideration which students benefit from this modality, and which students may struggle due to more intense needs or restricted support from caregivers (Hurwitz et al., 2021). When considering interventions, virtual or not, we must examine how effective interventions are on an individual level for autistic students.

The transition to the remote learning environment during the pandemic was challenging for educators and contributed to high rates of educator dropout due to additional demands related to instructional requirements (Pressley, 2021). In order for the implementation of remote autism-focused EBPs to be successful in the future, feasible ways to promote EBP use in this environment must be developed. In accordance with the recommendations of Spain et al. (2021), educators and researchers must work together with autistic students and their families to use the information gathered from the pandemic to develop methods for everyone to be supported effectively in the future. Remote learning presented not

only incredible challenges for educators serving autistic children but also new opportunities for EBP use and greater demands for support and resources to meet autistic students' needs. Other recent evidence from community clinicians suggests that telehealth services similarly presented both barriers and facilitators for delivering services to autistic individuals and their families (Fell et al., 2023). As remote learning continues to be a potential modality, further research is needed to understand EBP delivery for autistic students in remote settings with consideration of the vast number of EBPs developed to support autistic children, physical elements and requirements of particular autism-focused EBPs (e.g., data collection and monitoring, and materials), and complexity and demand (e.g., difficult to use EBPs and frequency of use), which may uniquely impact the quality of remote EBP implementation.

Acknowledgments

The authors thank the Washington Office of Superintendent of Public Instruction's Learning Options, Achievement Data, and Student Information teams for their consult and publicly available data. The authors also thank Dr. Maria Hugh (University of Kansas) for her contributions to qualitative data collection.



Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded by the Institute of Education Sciences (Grant R324A200033).

ORCID iDs

Alyssa M. Hernandez  <https://orcid.org/0000-0002-5573-8657>
Jill Locke  <https://orcid.org/0000-0003-1445-8509>

Supplemental Material

Supplemental material for this article is available online.

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