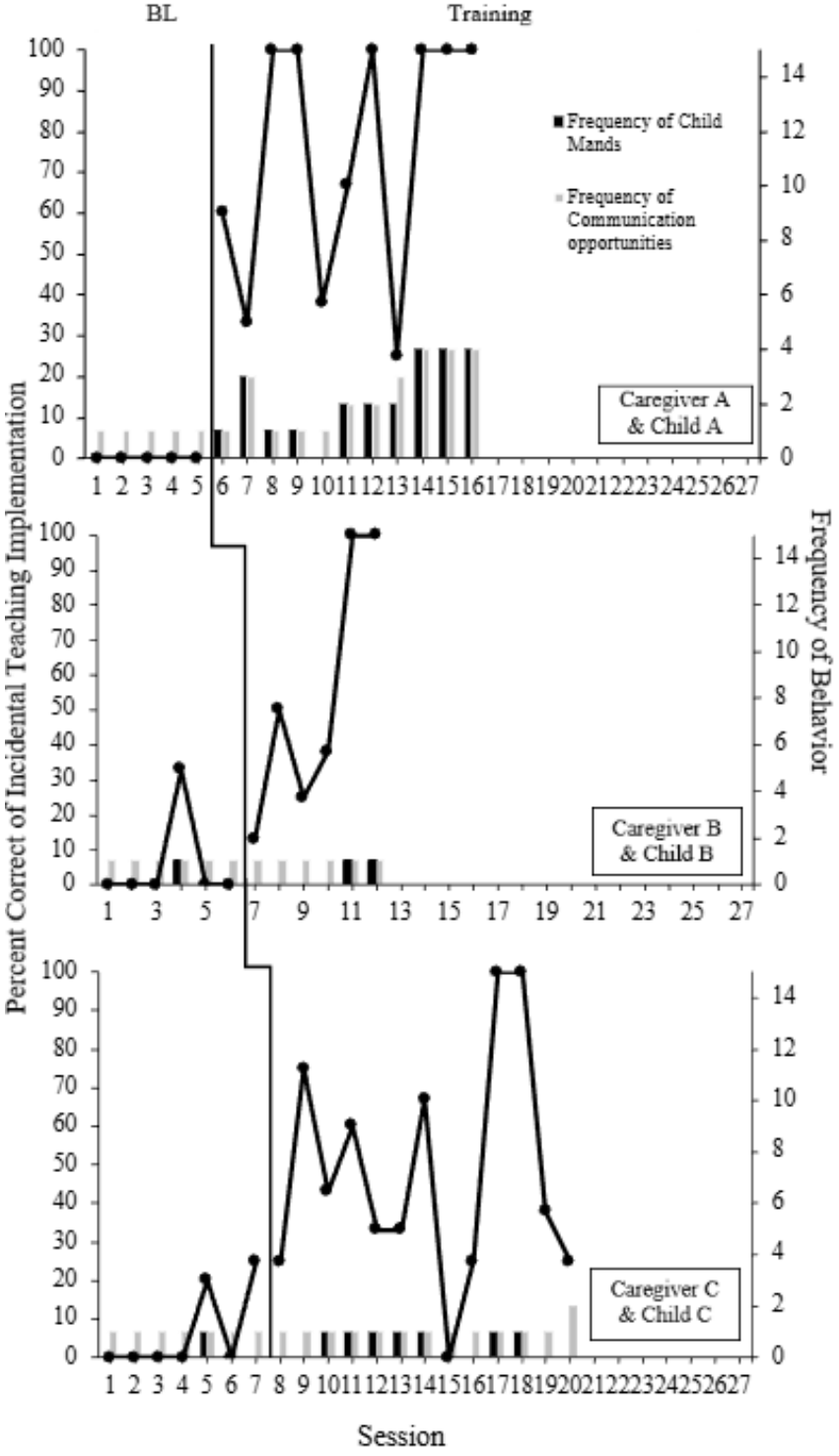
Abstract

Telehealth is becoming a vital tool for preparing and training caregivers to support children with autism spectrum disorder (ASD). The purpose of this study was to examine whether a telehealth-based behavioral skills training (BST) approach could strengthen caregivers' fidelity of incidental teaching implementation during everyday routines. The study also evaluated caregivers' perceptions of the BehaviorBuddy application with respect to acceptability, usability, and feasibility. A single-case multiple-baseline design was employed to evaluate the effects of the training on caregiver fidelity of implementation, the frequency of communication opportunities provided, and the frequency of child mands. Three participants were taught to implement incidental teaching through a telehealth-delivered BST that included instruction, modeling, rehearsal with their child, and feedback. Following the training, caregivers were instructed to download the BehaviorBuddy app and use it independently once per day to practice their learned skills for approximately one week. Results showed that all caregivers demonstrated improvements in their fidelity of incidental teaching implementation, with each participant reaching 100% fidelity. Caregivers provided consistent communication opportunities across both baseline and training phases, while child mands increased for one of the three child participants. Caregivers rated the BehaviorBuddy application highly in acceptability and usability, and feasibility outcomes for caregiver satisfaction, attendance, and clinician fidelity were also high. Overall, these findings suggest that the telehealth-delivered BST was effective in improving caregivers' implementation of incidental teaching and that caregivers perceived the BehaviorBuddy application as highly acceptable, easy to use, and feasible to implement. However, low rates of independent at-home app usage indicate that additional support may be needed to promote more consistent integration of the application into their daily routines.

BehaviorBuddy Application

BehaviorBuddy is a phone application that was designed to support caregiver-led incidental teaching for vocal communication. The app records audio from caregiver-led practice sessions and uses artificial intelligence (AI) and machine learning to analyze the practice sessions. The app provides behavior-specific feedback to caregivers on their performance of incidental teaching and tracks child communication progress.



		N=3		
	TARF-R Items	Mean	SD	Range
1.	How acceptable do you find the BehaviorBuddy app to be regarding your concerns about your child?	6.00	1.00	5.00-7.00
2.	How willing are you to use the BehaviorBuddy app?	6.00	1.00	5.00-7.00
3.	Given your child's communication/behavioral problems, how reasonable do you find the BehaviorBuddy app to be?	6.00	1.00	5.00-7.00
4.	How costly will it be to use the BehaviorBuddy app?	4.33	2.52	2.00-7.00
5.	To what extent do you think there might be disadvantages in using the BehaviorBuddy app?	4.66	2.08	3.00-7.00
6.	How likely is BehaviorBuddy app to make permanent improvements in your child's communication?	6.00	1.00	5.00-7.00
7.	How much time will be needed each day for you to use the BehaviorBuddy App?	5.00	2.00	3.00-7.00
8.	How confident are you that the BehaviorBuddy app will be effective?	5.66	1.52	4.00-7.00
9.	How disruptive will it be to use the BehaviorBuddy app?	4.66	2.52	2.00-7.00
10.	How effective is the BehaviorBuddy app likely to be for your child?	5.66	1.15	5.00-7.00
11.	How affordable is the BehaviorBuddy app?	5.33	1.52	4.00-7.00
12.	How much do you like the procedures used by the BehaviorBuddy app?	5.66	1.15	5.00-7.00
13.	How willing will other family members be to use the BehaviorBuddy app?	6.00	1.00	5.00-7.00
14.	To what extent are undesirable side effects likely to result from using the BehaviorBuddy app?	5.33	2.08	3.00-7.00
15.	How much discomfort is your child likely to experience during the course of you using the BehaviorBuddy app?	5.33	2.08	3.00-7.00
16.	How willing would you be to change your routines to use the BehaviorBuddy app?	5.66	1.15	5.00-7.00
17.	How well will using the BehaviorBuddy app fit into your existing routines?	5.66	1.15	5.00-7.00
Total TARF-R Score		93	23.30	74-119

		N=3		
	SUS Items	Mean	SD	Range
1.	I think that I would like to use this app frequently	3.33	0.57	3.00-4.00
2.	I found the app unnecessarily complex	2.66	1.52	1.00-4.00
3.	I thought the app was easy to use	3.66	0.57	3.00-4.00
4.	I think that I would need the support of a technical person to be able to use this app	2.33	2.08	0.00-4.00

5. I found the various functions in this app were well integrated	3.66	0.57	3.00-4.00
6. I thought there was too much inconsistency in this app	2.33	0.57	2.00-3.00
7. I would imagine that most people would learn to use this app very quickly	3.66	0.57	3.00-4.00
8. I found the app very cumbersome to use	3.00	1.73	1.00-4.00
9. I felt very confident using the app	3.33	0.57	3.00-4.00
10. I needed to learn a lot of things before I could start using this app	2.66	1.52	1.00-4.00
Total SUS Score	76.66	18.76	57.5-95.0

Measures	Outcome	Range
Attrition (%)	0	-------
Attendance (%)	100	100
Adherence (%)	29.3	0-29.3
Satisfaction (1-5 scale)	4.00	3-5
Clinician Fidelity (%)	100	100
Clinician Time (hours)	4	3-5

This was assessed using a procedural task list adapted from Neely et al. (2016), which was adapted from Franzone (2010) and Hart and Risley (1968). There was a total of 10 possible behaviors (see Table 1). Each communication opportunity was reviewed to determine the percentage of correctly completed steps.

	Anticipated Caregiver Behavior
1	Does the caregiver start the opportunity by asking "what do you want"
2	Does the caregiver wait 3-6 seconds after asking "what do you want?" (or 1st prompt) before prompting again?
3	If the child does not correctly respond to "what do you want?" (or 1st prompt), does the caregiver provide a clear vocal model at the target communication level?
4	Does the caregiver wait 3-6 seconds after the first vocal model before prompting again?
5	If the child does not correctly respond to the first vocal model, does the caregiver provide a second vocal model at the target communication level?
6	Does the caregiver wait 3-6 seconds after the second vocal model before prompting again?
7	If the child does not correctly respond to the second vocal model, does the caregiver provide a final vocal model at the target communication level?
8	If the child provides a correct response, does the caregiver repeat and expand within 3 seconds?
9	Does the caregiver provide no more than 3 vocal models in a single opportunity?

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