

Ethical Considerations When Delivering Behavior Analytic Services for Problem Behavior via Telehealth

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Delivery of health care services via telehealth has been growing in popularity, and work completed by behavior analytic researchers and practitioners have supported this trend. Behavior analysts at the University of Iowa Children's Hospital (UICH) developed a telehealth model of service delivery to build upon their already established in-clinic and in-home services. Results from their telehealth studies showed positive effects. Social functions were identified for most children, and problem behavior decreased by an average of 94.14%. Additionally, parent satisfaction was quite high, suggesting this mode of service delivery was acceptable to caregivers. Given the increasing empirical support for providing behavior analytic services via telehealth, careful consideration needs to be given to the numerous ethical issues involved in telehealth service delivery. The current article describes the telehealth service delivery model developed at UICH as well as the ethical issues considered at different points when delivering these telehealth services. Following these ethical considerations, implications for future research and clinical practice are discussed.

Keywords: ethics, functional analysis, functional communication training, telehealth

Telehealth is defined as the delivery of health care services via electronic modalities (Institute of Medicine, 2012), and has been incorporated into the fields of psychiatry (e.g., Grubaugh, Cain, Elhai, Patrick, & Frueh, 2008), nursing (e.g., Hunkeler et al., 2000), speech pathology

(e.g., Mashima & Doarn, 2008), psychology (e.g., Wade & Wolfe, 2005), and behavior analysis (e.g., Fisher et al., 2014; Frieder, Peterson, Woodward, Crane, & Garner, 2009; Machalicek et al., 2009a, 2009b; Wacker et al., 2013b, 2013a), among others. With the constantly evolving state of technology, telehealth has become an increasingly attractive area of research and practice. One reason for its popularity is that major metropolitan areas attract the most specialty care providers, leaving patients in rural or remote areas with little to no routine access to these providers (Chan, Hart, & Goodman, 2005). This lack of access often requires patients from these areas to travel extended distances to receive services, which may be a limiting factor for families from a lower socioeconomic status. Thus, researchers and practitioners, alike, have an interest in determining the conditions under which their evidence-based procedures can be effectively delivered via telehealth to expand the availability of their services. As an increasing number of professional service groups join the telehealth movement, it is important for researchers and practi-

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tioners to consider their ethical responsibilities. This is especially important because services provided via telehealth are likely to expand.

One example of a telehealth program was developed by David Wacker, Ph.D., Scott Lindgren, Ph.D., and their colleagues at the University of Iowa Children's Hospital (UICH). The program was developed to investigate the utility of using telehealth for assessing and treating young children's problem behavior via behavior analytic technologies. The telehealth program at UICH is an extension of the BioBehavioral Outpatient Service (BBS-Outpatient; Wacker et al., 2016), which was originally created to deliver in-clinic behavioral assessment and treatment services to individuals who engage in severe problem behavior. As described by Lindgren et al. (2016), there are three main goals for modern health care: (a) to increase accessibility of services, (b) to decrease cost for service, and (c) to maintain positive outcomes. The telehealth services at UICH attempted to address each of these goals.

In this article, we review the evolution of BBS-Outpatient at UICH from an in-clinic mode of service delivery to one that included in-home telehealth. Descriptions of the development of the Iowa telehealth model are provided to highlight some of the most relevant ethical considerations encountered and addressed when delivering behavior analytic services to assess and treat problem behavior via telehealth.

Evolution of Service Delivery Models in Iowa

In-Clinic Service Delivery

BBS-Outpatient serves children and adults diagnosed with developmental disabilities who engage in severe problem behavior (e.g., self-injurious behavior [SIB], aggression) within a 90- to 120-min appointment at UICH. Brief functional analyses (Northup et al., 1991) are conducted and caregivers (e.g., parents, school teams) are taught by the BBS-Outpatient psychology team to implement function-based treatments to decrease their child's problem behavior. These evaluations are also supported by the expertise of a multidisciplinary team consisting of medical and speech-language pathology providers. For full descriptions of the BBS-

Outpatient model, please refer to Wacker, Schieltz, and Romani (2015).

While the results from the brief outpatient analyses have made important contributions to the literature (e.g., Cooper, Wacker, Sasso, Reimers, & Donn, 1990; Derby et al., 1992; Northup et al., 1991), there are several limitations to this method of service delivery. Some examples include the necessity for caregivers to travel to the clinic for their appointment and having the procedures conducted in an analog environment (rather than in the natural environment). Regarding travel, many families may find it difficult-or uncomfortable-traveling from the rural areas of Iowa to a clinic in one of the major metropolitan areas of the state for this specialized service (Wacker et al., 2013a). Seventy-eight of the 99 counties in Iowa are considered rural (State Data Center, 2015), and as of October 2015, there were 74 Board Certified Behavior Analysts (BCBAs) in the state of Iowa (Behavior Analysis Certification Board, 2015), with the majority (approximately 78%) of these practitioners being located in or near the metropolitan areas of the state (e.g., Iowa City, Des Moines). Thus, for some families travel may include distances upward of 340 miles one way (e.g., Lyon county, IA to Iowa City, IA) to receive these behavior analytic services. Economically, this may pose a barrier for people coming from disadvantaged backgrounds or those without consistent access to transportation, which, as described by Wacker et al. (2015), is primarily the clientele served by BBS-Outpatient. As a result, accessibility and costs of service delivery may be limiting factors for some families when referred to an outpatient clinic.

In-Home Service Delivery

Given the limitations of the in-clinic model described above, Wacker and his colleagues received a series of federal grant funds (Wacker & Berg, 1992; Wacker, Berg, & Harding, 1996, 2000, 2004) to determine if caregivers could be coached by behavior analysts to implement functional analysis (FA; Iwata, Dorsey, Slifer, Bauman, & Richman, 1994) and functional communication training (FCT; Carr & Durand, 1985) procedures with their young children (6-years-old or younger) engaging in severe problem behavior within their homes. All families participating in these studies lived within a 100-

to 150-mile radius of UICH. Specific descriptions of the FA and FCT procedures and the behaviors they targeted are beyond the scope of this paper, but can be obtained in [Harding, Wacker, Berg, Lee, and Dolezal \(2009\)](#). Results of these studies were positive, and showed that the average reduction in problem behavior was 95.76% (range, 59.07%–100%) for children who completed FCT treatment ([Lindgren et al., 2016](#)). In addition, treatment acceptability data were gathered from the Treatment Acceptability Rating Form-Revised (TARF-R; [Reimers & Wacker, 1988](#)), which was a rating form employing a Likert-type scale of 1 (*unacceptable*) to 7 (*very acceptable*). Caregiver's response to the question "How acceptable do you find the treatment to be regarding your concerns about your child?" was high ($M = 6.55$; range, 5–7). These data suggested that the caregivers found the FA and FCT procedures to be highly acceptable.

Overall, this in-home model of service delivery maintained and improved upon the in-clinic model. Specifically, the physical presence of the behavior analysts continued to allow for immediate feedback and modeling to shape caregiver behavior, which likely led the caregivers to implement procedures with acceptable fidelity. However, at the same time, having a behavior analyst travel to a home each week can be expensive and time consuming (e.g., [Shore, Brooks, Savin, Manson, & Libby, 2007](#)). The average cost to complete treatment in the in-home studies conducted by Wacker and his colleagues was \$5,949.97 per child, and travel was limited to a 100- to 150-mile radius around UICH ([Lindgren et al., 2016](#)). While the in-home model of service delivery improved several aspects of the in-clinic model, those improvements were not sufficient for improving the services and care for all families in Iowa with children who engaged in severe problem behavior. Therefore, the need to identify alternative services that increased accessibility and decreased costs became the focus of additional research endeavors led by Wacker, Lindgren, and colleagues.

Telehealth Service Delivery

The first attempt at bridging the in-clinic and in-home models of service delivery was conducted by [Barretto, Wacker, Harding, Lee, and](#)

[Berg \(2006\)](#), who offered behavior analytic services via the Iowa Communications Network (ICN) to two children who lived in a rural area of the state of Iowa. The ICN was a network of fiber-optic cables that connected most of the hospitals and high schools throughout the state; thus, allowing for accessibility to specialists at greater distances without the need for extensive travel. In this study, the remote ICN connection allowed the behavior analysts to connect directly from UICH to the children's school or a Department of Human Services office. For both participants, caregivers and local service teams were coached by the behavior analysts at UICH to conduct FAs to identify the variables maintaining each child's problem behavior. Results from these analyses showed that problem behavior was maintained by escape from nonpreferred activities. These findings suggested that conducting FAs via telehealth could be a safe and convenient alternative to the in-clinic or in-home modes of service delivery while simultaneously decreasing the travel requirements for families and professionals.

In-Clinic Telehealth

With the growing capacities of the Internet and the initial positive results regarding the ability to conduct FAs via telehealth (e.g., [Barretto et al., 2006](#)), [Lindgren and Wacker \(2009\)](#) received federal funding to further evaluate the utility of coaching caregivers to conduct FAs and FCT. To continue bridging the in vivo models (in-clinic and in-home) and telehealth models, the remote connection occurred between UICH and satellite clinics affiliated with UICH across the state of Iowa. Lindgren and Wacker approached this extension of the telehealth work completed by [Barretto et al. \(2006\)](#) with caution by ensuring the safety of the child and caregiver with the presence of additional on-site support in a clinic setting. In general, procedures were similar to the in-home model previously described. Participants were young children (aged 2–6 years) diagnosed with autism spectrum disorder (ASD) who engaged in severe problem behavior and lived within 50 miles of the satellite clinic. In addition to the children and caregivers, parent assistants were also present throughout the study to provide on-site support to the caregivers prior to and during the evaluations. All FA and FCT proce-

dures were conducted in the same way as those referenced earlier for the in-home project. For a complete description of the study procedures, please refer to [Wacker et al. \(2013a, 2013b\)](#). Results from this in-clinic telehealth project showed a mean reduction in problem behavior of 91% (range, 47.4%–100%) for children who completed treatment and an average caregiver acceptability rating of 6.53 (range, 5–7). These data showed similar reductions in problem behavior, and similar caregiver acceptability was achieved via in-clinic telehealth ([Lindgren et al., 2016](#)).

In-Home Telehealth

In their continued attempt to provide services directly in the home environment, [Lindgren and Wacker \(2011\)](#) again received federal funding to extend their telehealth research to the home setting. Children participating in this project were aged 2–6 years, diagnosed with ASD, engaged in severe problem behavior, and lived in Iowa at the time of enrollment. All FA and FCT procedures were conducted in the same way as the in-home model previously referenced. Detailed procedures for this model were described by [Suess et al. \(2014a\)](#). The average reduction of problem behavior was shown to be 97.27% (range, 77.01%–100%) for children completing treatment, and caregiver acceptability ratings ranged from 4–7, with an average of 6.25 ([Lindgren et al., 2016](#)).

Taken together, all three models of service delivery (in-home, in-clinic telehealth, in-home telehealth) obtained comparable results in terms of behavioral outcomes: specifically, reductions in problem behavior and similar caregiver acceptability ([Lindgren et al., 2016](#)). These results supported the utility of telehealth as an effective model of service delivery. To further support telehealth as a viable service delivery option, [Lindgren et al. \(2016\)](#) evaluated the treatment costs across all three models, and showed that the mean total cost per child (including staff, facility, and family costs) decreased with each service-delivery model. The most significant decrease in costs occurred between both in-home models, with the mean total cost per child decreasing from \$5,949.97 (in-home model) to \$2,145.64 (in-home telehealth model), which was a savings of \$3,804.33. Thus, the three goals of modern health care were addressed through the in-home telehealth project.

Ethical Considerations Related to Telehealth

Given the supporting evidence for the use of telehealth as an effective service delivery model, various aspects related to the development of a telehealth service need to be considered including technological, administrative, clinical practice, and ethical guidelines. Broad guidelines for each of these areas are available from organizations such as the American Telemedicine Association ([ATA, 2013, 2014](#)) and the American Psychological Association ([APA, 2013](#)). Our ethical obligations require further discussion as they relate to providing direct behavior analytic services via a telehealth service delivery model. Although all APA ([APA, 2010](#)) and Behavior Analysis Certification Board ([BACB; BACB, 2014](#)) ethical guidelines apply to telehealth, we will focus on several specific guidelines to highlight how telehealth may facilitate and/or raise potential concerns when attempting to comply with them. This discussion will occur within the context of a case study conducted during the in-home telehealth project. Our case example follows the Iowa telehealth model ([Wacker et al., 2016](#)) for treating severe problem behavior via telehealth, which, as described by [Wacker et al. \(2016\)](#) included a three-step sequence consisting of (a) determining equipment needs, (b) conducting an initial meeting, and (c) conducting the evaluation procedures. Although this sequence of activities was procedurally linear, this was not the case when considering potential ethical issues. Thus, ethical considerations that occurred in this case are described in chronological order, meaning that some ethical issues were recurring throughout the child's participation in the project. Please refer to [Table 1](#) for a summary of the ethical procedures discussed and their potential implications.

Case Introduction

Eli was a 56-month-old boy diagnosed with ASD. His home was located 84 miles from UICH. Problem behaviors targeted during the FA and FCT were SIB (e.g., head banging, head hitting), aggression (e.g., biting, hair pulling, kicking), property destruction (e.g., throwing things), and elopement (e.g., running out of the house). He communicated using some gestures

Table 1

Summary of Specific BACB and APA Ethical Guidelines Related to Telehealth Service Delivery and Associated Examples That Facilitate or Raise Potential Ethical Concerns

Ethical code	Ethical guideline themes	Implications	Associated telehealth model step(s)
BACB 1.02 & APA 2.01	Boundaries of competence	Therapist skills needed to conduct procedures effectively	Choosing a service delivery model
BACB 1.05	Professional and scientific relationships	Building rapport; Remotely attending to social cues from caregivers	Initial meeting & evaluation procedures
BACB 1.06 & APA 3.05	Multiple relationships	Could decrease opportunity as therapist and caregiver likely have never met in person	Choosing a service delivery model
BACB 2.01	Accepting clients	Selecting clients that the behavior analyst feels comfortable treating.	Choosing a service delivery model
BACB 2.06, APA 4.01, & APA 4.02	Maintaining & discussing the limits of confidentiality	Security is known if HIPAA & FERPA compliant; Concern about unauthorized person accesses sessions	Initial meeting & evaluation procedures
BACB 2.09	Treatment/intervention efficacy	Understanding the conditions under which procedures can be communicated with sufficient clarity to promote procedural fidelity.	Choosing a service delivery model & evaluation procedures
BACB 2.12 & APA 6.04	Contracts, fees, and financial arrangements	Need to advocate for insurance coverage for telehealth services	Choosing a service delivery model
BACB 2.15, APA 10.09, & APA 10.10	Interrupting or discontinuing services	Behavior analysts should facilitate transition of service delivery to new providers to avoid service interruption/disruption	Evaluation procedures
BACB 3.03 & APA 3.10	Informed Consent	Need for written consent for treatment	Initial meeting & evaluation procedures
BACB 3.04, BACB 4.05, & APA 9.10	Explaining assessment results	Reliance on vocal only information; Modeling is difficult to implement via telehealth	Evaluation procedures
BACB 4.07 & APA 3.04	Avoiding harm	Almost always have view of client when others physically present do not; Severity of behavior; safety within the environment	Initial meeting & evaluation procedures
BACB 8.04	Media presentations and media-based services	Ability to troubleshoot technology issues; Ability to maintain familiarity with changing equipment and systems needs	Determining equipment, initial meeting, & evaluation procedures

Note. APA = American Psychological Association; BACB = Behavior Analysis Certification Board; HIPAA = Health care Insurance Portability and Accountability Act; FERPA = Family Educational Rights and Privacy Act.

(e.g., clapping for “more”) and single words (e.g., “mama,” “no”). Eli’s mother was a 27-year-old stay-at-home caretaker. She was unmarried and her highest level of education was technical school. Eli and his mother participated in nine and 12 weekly visits during the FA and FCT, respectively. Compared with other children enrolled in the in-home telehealth project (Lindgren et al., 2016), Eli experienced more visits, on average, during both the FA ($M =$

4.90 weekly visits; range, 2–11) and FCT ($M =$ 9.10 weekly visits; range, 2–23).

Determining Equipment Needs

We interviewed Eli’s mother by telephone to determine her equipment needs. She did not have access to the necessary equipment (computer, web cam, Ethernet cable, and Internet service) needed to conduct the telehealth ses-

sions. Therefore, a laptop computer and other needed equipment (web cam and Ethernet cable) were shipped to her from our equipment-lending library. In addition, Internet service to the home was purchased through a local-cable provider. Following the arrival of the equipment and the set up of the Internet service, we held a technology meeting to familiarize Eli's mother with the equipment and steps needed to connect via telehealth. This meeting occurred initially by telephone and ended with a test of the Skype connection. A complete description of the technology specifications we used in our telehealth projects is summarized by Lee et al. (2015).

Determining Equipment Needs: Ethical Considerations

One of the biggest limitations to the delivery of behavior analytic services via telehealth is determining that a communication program is compliant with the Health care Insurance Portability and Accountability Act (HIPAA) and/or the Family Educational Rights and Privacy Act (FERPA). According to the BACB Ethical and Compliance Code (8.04 Media Presentations and Media-Based Services) and APA Ethics Codes (4.01 Maintaining Confidentiality), behavior analysts have a responsibility to determine the safety of various web-based communication programs to maintain their patient's confidentiality and privacy. Thus, it is important to determine which web-based communication programs are HIPAA or FERPA compliant as well as understand the limitations of the communication system so as to inform patients of the limits of confidentiality (APA 4.02 Discussing the Limits of Confidentiality) and to obtain their informed consent (APA 3.10 Informed Consent; BACB 3.03 Behavior-Analytic Assessment Consent). One benefit of using a telehealth communication system that claims HIPAA and/or FERPA compliance (e.g., Adobe Connect, Vidyio, vSee, HIPAA-Chat) is that security is known. However, even with the known security of these types of communication systems, patients should still be made aware of the possibilities that an unauthorized person may find a way to obtain access to the assessment or treatment sessions. At the time of our projects, Skype had not yet been identified as an HIPAA approved

program. However, with all cases, including Eli's, caregivers were informed of potential privacy violations, and were asked to provide written consent if they agreed to continue participating in the telehealth project. During these conversations, many parents were not concerned with the use of Skype or any other communication system as using these were common practice (e.g., military families who connected remotely with each other on a weekly basis) and facilitated access to behavioral services for their children that may not have been available before.

Initial Meeting

Following an interview with Eli's mother (Eli was not present during this meeting), the living room was chosen for conducting the sessions. The living room was ideal because (a) the computer could be connected directly to the cable modem providing the most optimal Internet connection and (b) most areas of the apartment could be blocked off with a baby gate which decreased the availability of nonviewable areas. Limiting nonviewable areas was important for minimizing lost session time and potential harm when the behavior analyst could not observe Eli and, thus, not be able to coach Eli's mother. The computer and web cam were placed on top of an entertainment center which allowed the behavior analyst to observe Eli playing with toys and completing task demands.

Initial Meeting: Ethical Considerations

During the initial meeting via telehealth, several BACB (1.05 Professional and Scientific Relationships; 4.07 Environmental Conditions that Interfere with Implementation) and APA (3.04 Avoiding Harm) ethics codes were discussed. During this meeting, Eli's mother was able to express her concerns regarding Eli's problem behavior. It was also a chance to discuss how the procedures may address those concerns. In addition, the behavior analyst was able to view the environment, assess for potential harm, and develop a plan with his mother for conducting these sessions, which included discussing response options if Eli were to elope from the living room. In essence, this initial telehealth meeting provided an opportunity to build rapport with Eli's mother by ensuring that

her son would remain safe during our assessment and treatment conditions.

Evaluation Procedures

During the FA sessions, Eli appeared unaware of the computer screen and the behavior analyst coaching his mother via Skype. However, his mother frequently reported that Eli played with the Ethernet cables and web cam throughout the week. Overall, Eli's appropriate behavior was limited. Thus, during sessions, Eli was routinely observed playing with the Ethernet cords, obtaining food from the refrigerator, climbing on the stove and kitchen table, or running through the baby gates. In response to these behaviors, Eli's mother was coached by the behavior analyst to remove or block his access to activities that were deemed unsafe. For example, when Eli twirled the Ethernet cords or climbed on things in the kitchen, his access was removed and he was redirected to more appropriate activities, such as playing with toy cars.

Prior to each FA session, the behavior analyst vocally described the purpose and procedures for each condition. Throughout FA sessions, vocal praise and encouragement were delivered for conducting procedures accurately and corrective feedback was provided when procedural errors compromised the integrity of the FA. Eli's mother appeared to understand all vocal directions prior to and during FA sessions. Therefore, the behavior analyst was not required to determine other means for communication. In addition, as the FA progressed, the behavior analyst only had to provide minimal information about the condition to conduct, such as the condition name (e.g., "free play").

One technology problem that occurred early on and throughout our work with Eli and his mother was that the web cam automatically flipped the view of the living room, in which the front door was shown on the right side of the screen instead of the left where it was actually located. Because this did not interfere with the procedures for the project, the behavior analyst never attempted to determine and troubleshoot the technological issue. Other technology issues that occurred throughout Eli's involvement in the project were frozen video feeds, delays in audio or video feeds, and lost connections. These technology problems only prevented ses-

sions from being conducted one time during the telehealth project, and the problem was quickly resolved by our institutional technology (IT) support person.

During the FA, Eli and his mother moved to a different house. The new house was located 80 miles from UICH. During the move, delays in the project occurred. Because we bought the Internet service for Eli and his mother to participate in our project, we had to transfer this service to the new residence. When we were able to reconnect with Eli's mother, we had to reestablish a location for the sessions. Again, the living room was chosen for sessions to be conducted. The living room in the new residence was long and narrow and shared a half-wall with the kitchen which was the only place to which Eli could escape. The computer and web cam were again placed on top of the entertainment center because it was the best option for capturing most of the living room and kitchen. However, if Eli played with toys on the floor or went to certain areas of the kitchen, he could not be seen on camera. The only solution we had for this problem was for Eli's mother to direct the web cam toward Eli when he was in these unviewable areas. A total of 29 sessions across nine telehealth meetings were conducted during the FA. Results suggested that Eli's problem behavior was maintained by negative reinforcement in the form of escape from demands.

Prior to beginning the FCT treatment, a brief meeting via Skype occurred. During this meeting, the results of the FA and the upcoming FCT procedures were described to Eli's mother. Please refer to [Harding et al. \(2009\)](#) for specific information about the FCT procedures. In the middle of FCT, the behavior analyst moved out of state to begin a new position. To address this change in providers, the behavior analyst discussed this transition with Eli's mother a couple of months before the transition. In addition, the replacement behavior analyst was introduced to Eli and his mother, and shadowed the behavior analyst during a couple of sessions. Because the behavior analysts worked together on the same in-home telehealth project, the replacement behavior analyst was already familiar with Eli's programming and progress. FCT was implemented for 38 sessions across 12 telehealth visits, and Eli's problem behavior was reduced by 100% by the end of treatment.

Evaluation Procedures: Ethical Considerations

Throughout the evaluation procedures, numerous ethical issues arose at different points in time with some being facilitative and others raising concern. One ethical code that appeared at various points throughout our evaluations of Eli was BACB 4.07 (Environmental Conditions that Interfere with Implementation). Issues related to this code ranged from broken equipment or interrupted service to potentially harmful behaviors. In most instances, we were able to address the issue with little disruption to the evaluations. Specifically, when equipment broke, alternative options (e.g., use of the integrated webcam) were determined fairly quickly, which bought us time to get the ideal equipment shipped to Eli's mother. When the behavior analyst observed potentially harmful behaviors (e.g., climbing on the stove), these were also addressed fairly quickly by coaching Eli's mother to make adjustments to her responses within the environment. The fact that the behavior analyst almost always had sight of Eli even though his mother did not was a benefit for the use of telehealth. For example, in an FA attention session in which Eli's mother was instructed to turn her back on him and only respond to problem behavior, the behavior analyst was able to coach the mother's responses almost immediately when Eli was observed to engage in the potentially harmful behaviors. Although potentially harmful behaviors were easily addressed in this case, caution should be taken when assessing and treating severe problem behaviors via telehealth as not all harm may be avoided. For example, the severe problem behaviors for one case on our project switched mid-evaluation from being socially maintained to being automatically maintained. The behaviors were of such severity that our research team decided to discontinue services via telehealth and transfer those services to our day treatment program because we felt we could no longer keep the child safe.

Several other ethical challenges arose related to communication and continuity of services. First, telehealth is inherently a mostly vocal communication device whereby presenting information visually or physically is difficult at best. Therefore, BACB 4.05 (Describing Behavior-Change Program Objectives), BACB

3.04 (Explaining Assessment Results), and APA 9.10 (Explaining Assessment Results) need to be considered carefully. In Eli's case, this issue did not arise as his mother was capable of processing all of the vocal information given to her by the behavior analyst. In other cases, this limitation of telehealth may need to be considered more carefully if the caregiver cannot follow vocal-only instructions. An alternative may be to consider how visual instructions may be utilized and supplement the service. Similar to these issues, BACB 1.05 (Professional and Scientific Relationships) may also be hindered if social cues are not read accurately. For example, because the caregiver is often further away from the webcam than the behavior analyst, it may be difficult to determine whether the caregiver is upset or understanding vocal directions or comments made by the behavior analyst.

Continuity of services, specifically BACB 2.15 (Interrupting of Discontinuing Services), APA 10.09 (Interruption of Therapy), and APA 10.10 (Terminating Therapy), is another area that poses some challenges to telehealth. Related to Eli, the behavior analyst moved to another state during treatment, which required a change of providers. In our projects, the behavior analysts never physically met the families. However, our team was large enough that this transfer was rather seamless as the other behavior analyst could shadow during Eli's sessions and meet the mother before connecting in the absence of the original behavior analyst. Thus, transfer of services could become complicated if there is not a team of providers at the host site.

Finally, technology issues routinely arose throughout the evaluation procedures. Therefore, BACB 8.04 (Media Presentations and Media-Based Services) becomes important for behavior analysts to consider. As technology evolves, behavior analysts must stay abreast of these advancements, not only with the ways in which to troubleshoot technology issues, but with the benefits and limitations of new equipment and programs. As mentioned earlier, being familiar with communication systems that are HIPAA or FERPA compliant is important, however, many other programs and systems are involved when conducting services via telehealth such as video recording programs, updated computers, and so forth. Given the chal-

lenges of staying up-to-date with equipment needs, behavior analysts should also consider the extent of their capabilities with troubleshooting technology issues as they arise after the telehealth system is in place. In our projects, all of our telehealth behavior analysts became proficient in troubleshooting technology issues on a day-to-day basis.

Other Considerations Related to Clinical Practice

Wacker et al. (2016) suggested a conceptual model for determining whether telehealth is an appropriate service delivery model. This model addressed five issues including whether (a) the problem can be treated safely via telehealth, (b) the Internet connection between sites is sufficient, (c) insurance reimbursement is provided for telehealth services, (d) a naturalistic setting for the service is beneficial, and (e) in-person support is needed. These were proposed as a decision-making tool when choosing service-delivery options.

First, the conceptual model asks practitioners to consider whether behaviors to be assessed and treated can occur safely via telehealth which directly addresses APA 3.04 (Avoiding Harm). Criteria used to determine the safety of telehealth services included whether the individual's problem behaviors could be managed safely by one person or if the problem behaviors could produce immediate harm to the child or the caregiver. Second, determining if the Internet connection is sufficient for services via telehealth falls under BACB 8.04 (Media Presentations and Media-Based Services). It is recommended that behavior analytic providers work with their IT departments to determine software that can be used to ensure the confidentiality and privacy of the patients they serve. It may be the case that several pieces of software need to be tried to determine the most effective one for the specific needs of the clinic. Practitioners should plan to give themselves plenty of time to go through this process to determine software that will be both HIPAA and FERPA compliant and also meet the needs of the clinic.

While technology has expanded access to health care services for a variety of individuals and disciplines (e.g., Grubaugh et al., 2008; Hunkeler et al., 2000), it may also serve as a

limiting factor for many others. Several of the families enrolled in the in-home telehealth project needed high-speed Internet service purchased for them. The grant funds purchased this service for families enrolled in the in-home telehealth service, though this might not be an option for families without high-speed Internet wanting to receive routine clinical care via in-home telehealth. Thus, as BACB 4.07 (Environmental Conditions that Interfere with Implementation) indicates, lack of high-speed Internet or technology capability in the home environment might limit the extent to which the behavior analyst can coach the caregiver to conduct FA and FCT.

Third, considering whether insurance reimbursement is possible for telehealth services encompasses BACB 2.12 (Contracts, Fees, and Financial Arrangements) and APA 6.04 (Fees and Financial Arrangements). These ethical guidelines are important at the initial step of developing a telehealth service because they will likely determine the course of treatment. Some states have legislation that reimburses services provided via telehealth; however, not all do. Thus, practitioners are encouraged to check with their state policies as well as the policies across jurisdictional lines. To address some of these limitations, practitioners may consider advocating at the state level for legislation (if it does not currently exist). In addition, insurance companies or institutions may have resources available to help families obtain these services. For example, university libraries may have computers and other equipment available for check out for families who would benefit from telehealth service. Behavior analysts need to be cognizant of these limiting factors to deliver the highest quality care for the children and families they serve.

In addition, to the questions posed by the conceptual model, practitioners should also consider other ethical guidelines such as BACB 1.02 (Boundaries of Competence), APA 2.01 (Boundaries of Competence), BACB 2.01 (Accepting Clients), and BACB 2.09 (Treatment/Intervention Efficacy), as these may directly impact the effectiveness of the telehealth service as well as the safety of the patient. For example, in Eli's case, the behavior analyst had at least 10 years of clinical experience with the in-clinic and in-home models of service delivery. Even with that experience, the behavior

analyst found that conducting those same assessments and treatments via telehealth was challenging and required reliance on good vocal communication skills rather than modeling the procedures, which was routinely done when physically present during the sessions.

Regarding the acceptance of clients, behavior analysts delivering telehealth services also need to be aware to only accept clients they feel qualified to treat. For example, a behavior analyst with training and supervision working with adults diagnosed with developmental disabilities may find it difficult to work with a young child. Pairing the child with the correct behavior analyst may be important to ensure successful treatment.

Finally, one other ethical area to consider is BACB 1.06 (Multiple Relationships and Conflicts of Interest) and APA 3.05 (Multiple Relationships). Telehealth may be one service delivery model that facilitates this ethical guideline by decreasing the opportunity to engage in multiple relationships. Because practitioners and clients may not ever physically meet in person, the likelihood of a multiple relationship being present or developing may be decreased. However, in contrast, multiple relationships may also be unavoidable if the telehealth practitioner is the only one in the state providing those services. This could potentially lead to the practitioner providing services to a family member.

Implications for Future Research

The delivery of health care services via telehealth is becoming an increasingly appealing mode of service delivery. Behavior analysts have shown a high level of interest in adapting services historically provided in-clinic or in-home to a telehealth model of service delivery (Fisher et al., 2014; Lindgren et al., 2016). This first generation of telehealth research related to the direct assessment and treatment of severe problem behavior has shown that young children (aged 2–6) diagnosed with ASD who engaged in problem behavior were likely to benefit from in-clinic or in-home telehealth treatment of problem behavior (Lindgren et al., 2016; Suess et al., 2014b; Wacker et al., 2013a). However, much work needs to be done to determine the conditions under which telehealth should be used to treat children engaging in

severe problem behavior. This work likely falls into at least four categories. First, novel research groups and practitioners should be encouraged to replicate and extend the results produced by previous researchers. Systematic replication is an effective way to establish the reliability and validity of the telehealth mode of service delivery.

Second, behavior analytic treatments delivered via telehealth have only been evaluated with socially maintained problem behaviors displayed by young children. Specifically, the children, presented in the Lindgren et al. (2016) and Wacker et al. (2013a, 2013b) studies, displayed problem behavior maintained by positive and/or negative reinforcement or did not show problem behavior during the FA. Thus, absent from these analyses are individuals who engage in problem behavior maintained by automatic reinforcement. Therefore, research is needed to determine the conditions under which treatment of automatically maintained problem behaviors via telehealth will be successful. As Roane, Fisher, Kelley, Mevers, and Bouxsein (2013) indicated, clinical judgment is an important factor in determining behavior function and the treatment strategies likely to decrease problem behavior. It can be argued that problem behaviors maintained by automatic reinforcement may require a high quality of clinical judgment that may be difficult for a behavior analyst to demonstrate remotely. Future research should continue evaluating the conditions under which children engaging in problem behavior maintained by automatic reinforcement can be treated via telehealth. In addition to studying automatic reinforcement, other researchers may want to evaluate the utility of telehealth with other populations of individuals such as adolescents or young adults. Older individuals may engage in problem behaviors with extensive histories of reinforcement, which may thus be more resistant to treatment. Another issue is that adults may be physically larger than their caregivers, which increases the risk for physical injury as a result of arranging conditions evocative for problem behavior.

Third, future research should investigate the assessment and treatment of severe problem behaviors that occur under idiosyncratic conditions, which are unlikely to be contrived well in a clinic setting. For example, the treatment of pediatric sleep disorders might benefit from

telehealth. Placing a night-vision web cam into a child's room might permit a behavior analyst to observe problem behaviors likely to occur at night when caregivers are sleeping. Research investigating conditions under which these behaviors can be successfully assessed and treated might be helpful.

It might be important to understand caregiver preference for the dose of telehealth treatment. Dose of treatment refers to the proportion of visits conducted via telehealth or via another mode of service delivery (e.g., in home). While the caregivers who completed the acceptability ratings in our projects responded favorably to questions about the acceptability of telehealth services, it was unclear whether they would have preferred at least a portion of the visits be on-site with a behavior analyst.

Conclusion

Within the field of behavior analysis, telehealth is a burgeoning area of research, in which the first generation of studies have shown that it has positive effects on behavioral outcomes, increased accessibility, and decreased costs. With these positive outcomes, it may be tempting to develop a research or clinical telehealth practice under the guise that it will be wholly successful. However, we caution future researchers and practitioners, alike, to be mindful of not only the technology aspects (which are summarized elsewhere) of such an endeavor, but the ethical aspects as well. As described, all APA and BACB ethical guidelines are relevant to any telehealth practice, but some specific guidelines appear to facilitate while others raise potential concerns. Therefore, as future telehealth research and clinical practice are developed, it is important for researchers and practitioners to evaluate and disseminate the conditions under which telehealth is and is not effective so that we continue to provide best practice to the individuals and families we serve.

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