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## An Evaluation of the Effects of Behavioral Skills Training on a Mindfulness-Based Protocol

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AN EVALUATION OF THE EFFECTS OF BEHAVIORAL SKILLS TRAINING ON A  
MINDFULNESS-BASED PROTOCOL

by

Chealsy M. Darby

A creative project submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF EDUCATION

in

SPECIAL EDUCATION

Approved:

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Logan, Utah

2020

## **ABSTRACT**

An Evaluation of the Effects of Behavioral Skills Training on a Mindfulness-Based Protocol

by

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Utah State University, 2020

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This evaluation examined the effects of behavioral skills training on the correct implementation of a mindfulness-based protocol by direct support staff who provide services to adults with intellectual disabilities in a community, residential setting. Participants included two direct support staff who provide services to two different adults with intellectual disabilities who have a mindfulness-based protocol as an intervention for problem behavior described in their behavior support plan. The participants were exposed to a behavioral skills training package and were required to demonstrate mastery criteria of the mindfulness-based protocol as part of their regular job duties. The results of this evaluation show that when this behavioral skills training package was implemented, the percentage of correctly implemented mindfulness-based protocol steps increased.

(39 Pages)

## **Introduction**

Providing effective staff training is commonly expected of behavior analysts who work in community, residential settings (Parsons, Rollyson, & Reid, 2012). The Behavior Analyst Certification Board®, Inc. (BACB®) outlines professional and ethical requirements for behavior analysts to follow. Requirements include guidelines that specify that behavior analyst must provide “effectively designed” training (BACB, 2014). Traditionally, behavior analysts have relied on verbal teaching strategies, such as vocal and written instructions to train staff. Generally, these teaching strategies have been shown to be ineffective because staff do not acquire the skills necessary to implement the intervention as intended (Parsons, Rollyson, & Reid, 2013).

Treatment integrity is the consistent and accurate implementation of an intervention as it is written (DiGennaro-Reed, Coddling, Catania, & Maguire, 2010). If an intervention is not implemented with high treatment integrity, positive client outcomes such as learning a new skill and reducing challenging behavior, are less likely to be achieved. In residential community settings, treatment integrity is very important. In these settings, staff are responsible to implement behavioral intervention plans, support adults in accessing community activities, perform housekeeping skills, and assist with activities of daily living, among various other necessary tasks. Staff who work in these settings frequently come in contact with challenging behaviors, such as physical and verbal aggression (Lambert, Bloom, Kunnavatana, Collins, & Clay, 2013). As a result, they are at a greater risk of burnout and physical health concerns due to incidents of challenging behaviors being a stressful aspect of their job (Van Oorsouw, Embregts, Bosman, , & Jajoda, 2010). In addition, staff are often minimally trained and do not have previous experience supporting adults with intellectual disabilities or implementing behavior

interventions. They often require extensive training and supervision from behavior analysts. However, there are many barriers that behavior analyst face when training in residential, community settings, such as, high turn-over rates in staff, high time consumption needed for training, high-supervisor-to-staff ratios, and staff working in various locations.

### **Behavioral Skills Training**

One method of training staff to implement behavioral interventions that is well researched and has been shown to be effective in many contexts is behavioral skills training (BST). BST is an evidence-based performance- and competency-based training strategy that requires the trainer to actively participate in the following steps: (a) provide verbal instructions, which often includes vocally describing the target skill and providing a written description of the skill to the trainee, (b) model or demonstrate the target skill to the trainee, (c) require the trainee to practice the target skill and (d) provide corrective feedback to the trainee during practice until the trainee reaches mastery criteria (Parson, et al., 2012). BST has been shown to improve staff performance in a wide range of behavioral interventions including discrete-trial teaching procedures (Clayton & Headley, 2018; Sarokoff & Strumey, 2004), picture exchange communication systems (Homlitas, Rosales & Candel, 2014) and behavioral interventions plans (Hogan, Knez & Kahng, 2014).

Although BST has been shown to be effective in many contexts, a common concern with BST is that it can require more time, than traditional verbal teaching strategies. However, more research is being conducted and is showing that BST can require minimal time from behavior analysts to effectively train staff. In the study conducted by Clayton and Headley (2018), researchers were able to train staff in a school setting to implement discrete-trial teaching procedures during a brief 10-minute procedure that resulted in improvements in staff

performance. When it came to using BST with staff to implement behavioral intervention plans, Hogan, Knez, and Kahng (2014) were able to demonstrate that a modest amount of time (45 minutes to 2.5 hours) was a sufficient amount of time for staff to meet mastery criteria during the training phase. These studies suggest that BST is a time efficient method of training.

While the research conducted on BST as an effective method of training staff is growing, we cannot assume that it will be effective in every instance. Even an extremely well-supported procedure such as BST must be carefully monitored to assess whether it is effective in the particular clinical or educational setting, and make adjustments if they are needed. Evidence-based practice does not remove the need for progress monitoring and case-by-case evaluation.

### **Mindfulness-Based Protocols**

Interest in mindfulness-based protocols (MBP) as clinical interventions continues to grow. MBP's appear to be effective and have positive outcomes for people without intellectual disabilities. Similar results have been observed when MBP's are applied to people with intellectual disabilities. Mindfulness can be described as nonjudgmental acceptance of internal and external stimuli in a person's present environment (Singh, N., Singh, J., Singh, A. D., Singh, A. N., & Winton, A., 2011). In clinical settings, MBPs have been developed to train people to practice mindfulness in their daily lives (Shapiro, G., Greenberg, J., Pedrelli, P., De Jong, M., and Desbordes, G., 2018). Mindfulness can be trained and practiced in many ways. One common way that mindfulness is taught is through guided meditation. During guided meditation, a trainer directs the trainee to focus their attention on the present environment and to accept the moment-to-moment changes without judgement. MBPs have been shown to be effective in treating a wide variety of disorders, such as, anxiety, depression, and post-traumatic stress disorder. Research on implementation of MBPs with individuals with intellectual disabilities show that they are able to

learn mindfulness practices and that mindfulness is an effective intervention for reducing incidents of problem behavior (Hwang & Kearney, 2013). MBPs implemented with adults with intellectual disabilities have been shown to reduce incidents of aggression (Singh, Wahler, Adkins & Myers, 2003) and symptoms of depression and anxiety (Idusohan-Moizer, Sawicka, Dendle, & Albany, 2015).

### **Meditation on the Soles of Your Feet**

One of the most well researched MBPs for adults with intellectual disabilities is *Meditation on the Soles of Your Feet (SoF)*. SoF is a mindfulness-based practice where the individual is taught to direct their attention to a neutral part of their body (e.g. the soles of their feet) from negative emotions or thoughts that trigger behaviors of concern (Hwang et al., 2013). SoF has been implemented with adults with mild to moderate disabilities in community, residential placements and has shown to decrease aggressive behaviors to a level where their community placement is no longer jeopardized (Singh, et al., 2003). Most research conducted on SoF has used experienced researchers as implementers providing direct training and coaching to individuals with intellectual disabilities. However, at least one study demonstrated that community-based therapists could train individuals with intellectual disabilities to implement the SoF protocol effectively (Adkins, Singh, Winton, McKeegan & Singh, 2010) suggesting that staff working in a community, residential setting could be trained to implement the protocol with individuals that they support.

### **Purpose Statement**

Previous research has shown that the use of BST is an effective way to train staff who implement behavioral interventions. In addition, SoF appears to be effective for individuals with intellectual disabilities so it is a worthy program for staff supporting these individuals to learn.

However, the process of evidence-based practice recognizes that the highest quality and most relevant evidence is an evaluation of the specific implementation in question. As a result, the purpose of this creative project is to evaluate the effectiveness of BST on two specific direct support staff implementing the SoF protocol in a community, residential setting with two adults who have intellectual disabilities.

### **Evaluation Questions**

Note: This creative project is designed to evaluate the effects of an instructional procedure on the behavior of two specific direct support staff. As an evaluation, it is intended to document the extent to which these *particular* direct support staff changed; it is not intended to create generalizable knowledge.

1. What are the effects of this use of BST on the percentage of correctly implemented steps of the SoF protocol by two direct support staff working in a community, residential setting with two adults who have intellectual disabilities?
2. To what extent will these two direct support staff find this implementation of behavioral skills training intervention meaningful and useful?

### **Method**

#### **Participants**

Two direct support staff who provide services to two different adults with intellectual disabilities who reside in separate residential homes participated in the study. Staff were recruited for participation because they were scheduled to begin offering the SoF protocol to clients with intellectual disabilities and had not been trained on the protocol. Both of the staff (a) had been employed by the residential provider for at least one month, (b) worked a minimum of 20 hours per week, (c) worked with an adult who had a mindfulness-based protocol outlined in



their behavior support plan, and (d) had no formal academic training in applied behavior analysis as determined by the *Direct Support Staff Background Questionnaire* (see Appendix A). The staff completed the direct support staff background questionnaire to determine what their educational and training background was. For this evaluation, the student evaluator targeted staff who do not have previous training in applied behavior analysis or implementing mindfulness-based protocols with adults with intellectual disabilities because monitoring their learning of the protocol is most important.

Clients (who are not participants in the evaluation, but are related because the participants will work with the clients) (a) reside in a residential home, (b) have a diagnosis of an intellectual disability, (c) are 18 years or older, (d) engage in behaviors of concern which include verbal or physical aggression (i.e. behaviors that are target for reduction in behavior support plans), and (e) have a mindfulness-based protocol in their behavior support plan.

Modifications were made to the selection of participants in this evaluation due to the COVID-19 Pandemic. Modifications include, (a) selecting direct support staff and clients who have been determined to be low-risk in contracting COVID-19, and (b) direct support staff who provide support to clients that live in homes where the clients go into the community frequently due to work, day program, etc.

## **Setting**

All sessions of the evaluation were conducted in two different residential homes for adults with intellectual disabilities where the direct support staff participants are assigned to work. One to three additional adults with intellectual disabilities who did not participate in the evaluation were present. One direct support staff, who is not a participant, was also present

during sessions because they were carrying out their daily routines and duties for the client participant and the other adults who reside in the home.

## **Materials**

The materials used during the intervention condition included written instructions for the mindfulness-based protocol (see Appendix B for protocol), a role-playing script for the BST of the mindfulness-based protocol with the direct support staff (see Appendix D for the BST Role-Playing Script), and data collection materials, such as writing utensils and the data collection sheets (see Appendix C and Appendix E). During all sessions of the evaluation, the direct support staff had access to written instructions for the mindfulness-based protocol and data collection materials, such as writing utensils and a data collection sheet.

## **Outcome**

The outcome of the evaluation is the percentage of the mindfulness-based protocol steps implemented correctly by two direct support staff. Percentage of correct implementation of the mindfulness-based protocol was based on observations of the direct support staff on the implementation of 24 separate steps that are outlined in the *Soles of the Feet Data Collection Sheet* (see Appendix C). A percentage measure was used to determine the correct implementation of the mindfulness-based protocol steps. Correct implementation of these steps were scored +. One or more deviations were scored as -. To derive a percentage, the total number of correctly implemented steps were divided by the total number of steps and multiplied by 100% to produce a measure of the percent of opportunities in which the direct support staff correctly implemented the mindfulness-based protocol.

## **Treatment**

The treatment is the implementation of the BST package by the student evaluator. When implementing the BST package, the student evaluator used the *BST Role-Playing Script* (See Appendix D) to ensure that all steps of BST were performed. Prior to implementation of this evaluation, the student evaluator practiced implementing the BST package with two novel staff participants across eight sessions. The student evaluator was observed via Zoom by two trained assistants who provided feedback to the student evaluator on their implementation using the *BST Data Collection Sheet* (See Appendix E).

### **Evaluation Design**

A single-subject design was used to evaluate the effects of the BST package on the percentage of correctly implemented steps of the mindfulness-based protocol by the direct support staff. The design included three conditions: baseline, intervention and post-intervention. The staff participants moved from the baseline condition to the training condition after the student evaluator observed implementation of the mindfulness-based protocol with the client participant one time. During the intervention condition, the staff participant was exposed to the BST package and was required to reach mastery criteria prior to moving to the post-intervention condition. Mastery criteria was set at 80% or higher. Effective implementation was demonstrated by a change in the percentage of correctly implemented mindfulness-based protocol steps when the two participants were exposed to the BST package.

### **Procedures**

#### **Baseline Condition**

During the baseline condition, the student evaluator observed the two direct support staff implementing the mindfulness-based protocol in the adults with intellectual disabilities' home. The student evaluator typically observes implementation of behavioral interventions in the

natural environment to ensure that staff are able to run behavioral interventions as intended. No contingency was in place requiring the direct support staff to read or review the procedures. The session began when the student evaluator entered the residential home. During these observations, upon arrival the student evaluator greeted the direct support staff and adults with intellectual disabilities on shift and let them know that they will be observing the implementation of behavioral interventions. After greeting the direct support staff and adults with intellectual disabilities, the student evaluator prompted the direct support staff to demonstrate three different behavioral interventions, with one of the behavioral interventions being the mindfulness-based protocol from the behavior support plans of the adults with intellectual disabilities. The three behavioral interventions were selected for this evaluation because data collected on these interventions suggested that training was needed and/or the direct support staff asked the student evaluator for additional training on the interventions during the staff training meeting that was conducted the month prior to the evaluation being implemented. This is exactly what the student evaluator does when identifying monthly trainings on interventions in the behavior support plan. The student evaluator observed the direct support staff implementing the behavioral interventions with the adult with intellectual disabilities and collected data on all three behavioral interventions. All three behavioral interventions were evaluated so that the direct support staff were not aware of what behavioral interventions were targeted for the evaluation. When collecting data on the mindfulness-based protocol, the student evaluator used the *Soles of the Feet Data Sheet* (see Appendix C). No other instruction, prompting, or feedback, were provided. In the clinical setting when the student evaluator is observing staff, the first observation does not always include instruction, prompting, or feedback. Instead, the student evaluator just observes

the staff in the natural environment to gather information on what support is needed. This process was reflected during baseline.

### **Intervention Condition**

During the intervention condition, the direct support staff were exposed to the BST package on the mindfulness-based protocol conducted by the student evaluator. The student evaluator used the *BST Role-Playing Script* (see Appendix D) and the *Soles of the Feet Data Collection Sheet* (see Appendix C). The *BST Role-Playing Script* was used as a guide for the student evaluator when training the direct support staff. When the direct support staff were prompted by the student evaluator to demonstrate the mindfulness-based protocol, the *Soles of the Feet Data Collection Sheet* was used to collect data on their demonstration. This data was used to provide corrective feedback to the direct support staff and to ensure that they reach mastery criteria. Mastery criteria was set at 80%. As soon as the direct support staff reached mastery criteria, they moved into the intervention condition. If the direct support staff did not reach mastery criteria, the student evaluator required the direct support staff to practice the mindfulness-based protocol with them again. The student evaluator provided corrective feedback to the direct support staff during practice until the direct support staff reached mastery criteria. The training condition was conducted in the residential home in a quiet location without the client present. The implementation of BST as described above is very similar to what the student evaluator does outside of this evaluation. The only difference was the development of the BST role-playing script, which was developed for this evaluation so that it could be used as a tool for other behavior analyst to use to quickly implement BST on the SoF protocol with other direct support staff.

### **Post-Intervention Condition**

During the post-intervention condition, after the direct support staff were exposed to the BST package and demonstrated mastery criteria of the mindfulness-based protocol with the student evaluator, the student evaluator conducted an observation of the direct support staff's implementation of the mindfulness-based protocol. During these observations, upon arrival the student evaluator greeted the direct support staff and adults with intellectual disabilities on shift and let them know that they will be observing the implementation of behavioral interventions. After greeting the direct support staff and adults with intellectual disabilities, the student evaluator prompted the direct support staff to implement the same three behavioral interventions that they demonstrated during the baseline condition. During the observation, the student evaluator collected data on staff implementation of all three behavioral interventions. The Soles of the Feet Data Collection Sheet (see appendix C) was used to collect data on staff's implementation of the mindfulness-based protocol. If data collected on the direct support staff's implementation of the mindfulness-based protocol did not meet mastery criteria of 80% or higher, the student evaluator provided feedback to the direct support staff using the data collected on the data sheet. After providing feedback, the student evaluator said goodbye to the direct support staff and adults with intellectual disabilities and left the home. This process was implemented until the direct support staff were able to score 80% or higher on the mindfulness-based protocol with the client participant.

### **Social Validity**

Following the completion of the evaluation, the two direct support staff were provided with a series of questions regarding the methods that were used during the project to determine the social validity of BST and the mindfulness-based protocol based on their opinions. The questionnaire that was used is shown below in *Appendix F*. The direct support staff provided

answers to these questions using a forced Likert scale. Their responses were used to determine the extent to which the two direct support staff felt the training was acceptable and effective and the skills learned were meaningful and useful.

## **Results**

**Staff Participant Ones' Results.** Figure 1 shows the percentage of correctly implemented steps of the mindfulness based protocol by Staff Participant 1. During baseline prior to exposure of the BST package, data show that Staff Participant 1 implemented 21% of the mindfulness-based protocol steps correctly and implemented 50% of the medication protocol steps correctly. Due to previous client behavior, the session of the Rewards Program had to be implemented as simulation with the student evaluator role-playing the client. Data show that Staff Participant 1 implemented 83% of the reward program steps correctly. During the intervention condition when Staff Participant 1 was exposed to the BST package, data show that staff implemented 95% of the mindfulness-based protocol steps correctly in a simulated role-playing session with the student evaluator. Staff participant 1 was able to reach mastery criteria after exposure to the BST package during one session. During the post-intervention condition, Staff Participant 1 implemented 90% of the mindfulness-based protocol steps correctly, which is an increase in percentage from baseline. Data collected on the other behavioral interventions during the post-intervention condition show Staff Participant 1 implemented 50% of the medication protocol steps correctly, which shows no change in percentage of correct implementation from baseline, and Staff Participant 1 implemented 50% of the reward program steps correctly, which is a decrease in percentage from baseline. This decrease is most likely due to the fact that the reward program was implemented as a role-play with staff during baseline and implemented with the client during post-intervention.

**Staff Participant Twos' Results.** Figure 2 shows the percentage of correctly implemented steps of the mindfulness based protocol by Staff Participant 2. During baseline, data show that Staff Participant 2 implemented 4% of the mindfulness-based protocol steps correctly. Staff Participant 2 was only able to complete step 4 of the written protocol (Staff participant locates the written protocol) during baseline. Data show that Staff Participant 2 implemented 14% of the earned reward protocol steps correctly and implemented 0% of the skin picking intervention protocol steps correctly. During the intervention condition when Staff Participant 2 was exposed to the BST package, data show that staff implemented 76% of the mindfulness-based protocol steps correctly in a simulated role-playing session with the student evaluator. Staff participant 2 was unable to reach mastery criteria after exposure to the BST after one exposure. As a result, BST was implemented again with Staff Participant 2. During the second exposure of BST, Staff Participant 2 implemented 95% of the mindfulness-based protocol steps correctly and reached mastery criteria. During the post-intervention condition, Staff Participant 2 implemented 61% of the mindfulness-based protocol steps correctly, which is an increase in percentage from baseline. Data collected on the other behavioral interventions during the post-intervention condition show Staff Participant 2 implemented 14% of the earned reward protocol steps correctly and implemented 0% of the skin picking intervention protocol steps correctly, which shows no change in percentage of correct implementation from baseline. Since Staff Participant 2 was unable to meet mastery criteria during the post-intervention condition, exposure to the BST package was implemented again. During the third exposure of BST, Staff Participant 2 implemented 90% of the mindfulness-based protocol steps correctly and reached mastery-criteria. The post-intervention condition was implemented again and Staff Participant 2 implemented 81% of the mindfulness-based protocol steps correctly and reached



mastery criteria. Data collected on the other behavioral interventions during the second implementation of the post-intervention condition show Staff Participant 2 implemented 43% of the earned reward protocol steps correctly, which is an increase from baseline, and implemented 0% of the skin picking intervention protocol steps correctly, which shows no change in percentage of correct implementation from baseline. The increase in Staff Participants 2's implementation of the reward program could be due to reactivity from the student evaluator coming in multiple times and asking to observe the same three behavioral interventions and a component of the earned reward protocol where the Staff Participant 2 was asked to identify how the client earns rewards in the AM. Staff Participant 2 was allowed to provide a vocal response to this step, due to Staff Participant 2 working in the evening only and not implementing the reward program steps until the evening (i.e. student evaluator observed evening implementation of reward program by Staff Participant 2, but only asked questions about implementation of the reward program in the AM).

### **Social Validity Results**

When the evaluation was complete, the participants responded to a series of questions about the BST package and the mindfulness-based protocol. The participants provided answers to these questions using a forced Likert scale that ranged from 1 (Strongly Disagree) to 4 (Agree). Results are shown below in table 1. It is important to note, when the student evaluator implemented the social validity questions with staff, an error was made in regards to the labels of the scale (i.e. the scale ranged from strongly disagree to agree and should have ranged from strongly disagree to strongly agree). This may have impacted staff responses in this area.

#### **Table 1**

##### ***Social Validity Results of Staff Participants***

Question	Staff Participant 1	Staff Participant 2
I enjoy implementing the soles of the feet training with my client.	4	4
<i>Soles of the Feet</i> is a good training for other clients to learn.	4	4
Doing the <i>Soles of the Feet</i> training with my client is too hard.	2	1
There are better trainings to help my client build skills than <i>Soles of the Feet</i> training.	1	2
I could use the skills that I learned in <i>Sole of the Feet</i> training in my personal life.	4	4
My client is better able to control his/her anger now that they can use <i>Soles of the Feet</i> .	3	2
During training I learned how to implement <i>Soles of the Feet</i> with my client quickly.	4	3
I feel more confident implementing <i>Soles of the Feet</i> training with my client after training.	4	1
I prefer the BST training that was used in this evaluation better than the agencies standard training practices (i.e. verbal teaching strategies).	2	4
My understanding of <i>Soles of the Feet</i> is clearer because of the training I received.	4	4

Ratings on a 4-Point Likert Scale

**Mindfulness-Based Protocol Social Validity.** When participants were asked social validity questions about the mindfulness-based protocol implemented in this evaluation, both staff agreed that they enjoyed implementing the *Meditation on the Soles of the Feet* training with the client they support, that *Meditation on the Soles of the Feet* is a good training for their clients

to learn, and that they could use the skills that they learned in *Meditation on the Soles of the Feet* in their personal life. In response to the question, “doing the Soles of the Feet training with my client is too hard,” Staff Participant 1 disagreed while Staff Participant 2 strongly disagreed. This suggest that both participants felt like the training was easy to implement with their client. In response to the question, “my client is better able to control his/her anger now that they can use Soles of the Feet,” Staff Participant 1 slightly agreed and Staff Participant 2 disagreed.

**Behavioral Skills Training Social Validity.** When participants were asked social validity questions about the behavioral skills training implemented in this evaluation, both staff agree that their understanding on the *Meditation on the Soles of the Feet* protocol is clearer because of the training that they received. In regards to the question, “I feel more confident implementing Soles of the Feet Training with my client after training,” Staff Participant 1 agreed, while Staff Participant 2 strongly disagreed. In regards to the question, “I prefer the BST training that was used in this evaluation better than the agencies standard training practices (i.e. verbal teaching strategies), Staff Participant 1 disagreed, while Staff Participant 2 agreed.

### **Discussions**

Given these results, the evaluation demonstrated that the implementation of a BST package was effective in increasing correct implementation of a mindfulness-based protocol by these two direct support staff working in a community, residential setting.

During the evaluation, data collected show an increase in percentage of staff implementation of the mindfulness-based protocol steps after being exposed to the BST package. While this increase was observed, the student evaluator notes that improvement was not observed in the quality in which the mindfulness-based protocol was implemented with clients. That is, although the staff implemented the steps, they did so in a manner that did not appear to

be high quality. While there was no specific data collected on the quality of staff participants performance during this evaluation, the student evaluator noted that the staff participants read the written protocol of the mindfulness-based protocol verbatim after being exposed to the BST package. Thus, it appears that the evaluation measure was not sufficiently sensitive to more subtle aspects of high-quality implementation. More practice of the mindfulness-based protocol is needed so that the staff participants are able to implement the protocol naturally, which in the opinion of the student evaluator, would improve quality and have better outcomes for the client participants. In future evaluations on mindfulness-based protocols I would develop fidelity of implementation measures that reflect these kinds of features and focus trainings on these aspects of quality of implementation.

The student evaluator implemented the BST package one-on-one with the staff participants in the natural environment during this evaluation. While this process was shown to increase percentage of staff implementation of the mindfulness-based protocol, in the clinical setting it is not always practical for a behavior analyst to meet with all of the direct support staff and train them one-on-one on behavioral protocols. In community, residential settings, state budgets often dictate client funding which impacts the time and resources that the behavior analyst has to provide high quality staff training. Future evaluations on BST packages will need to seek other methods of implementation which will reduce the amount of training time required of behavior analysts. The use of video models or pyramidal teaching of BST should be considered to address this concern.

In regards to social validity on the mindfulness-based protocol, staff participant's responses are overall positive due to their responses reflecting that the protocol is enjoyable and easy to implement, and an appropriate protocol for their client to learn. When staff participants

were asked if their client could better control their anger after training on the mindfulness-based protocol, staff participants had conflicting responses. This discrepancy could be due to the client's responses to implementation of the mindfulness-based protocol and the difference in topography and intensity of aggression that the clients engage in. While running sessions with the staff participants and clients, the student evaluator observed the clients making comments after the mindfulness-based protocol was implemented, that suggested that they doubted this training would help them (i.e. "That's supposed to help me with my anger?" or "How does thinking about my feet make me feel better?"). In addition, the topography and the intensity of aggression that the two client participants engaged in were significantly different (i.e. one client engaged in physical aggression towards staff and the other client engaged in verbal aggression typically directed towards family or friends and not staff). These could have had an impact on the staff participant's response on how their clients are managing their anger. In the future, social validity from the client participant's should be gathered to determine how they feel about the mindfulness-based training in their plans.

Social validity responses from these two staff participants on the BST package show that they were able to learn how to implement the mindfulness-based protocol quickly and that their understanding of the protocol was clearer after being exposed to the BST package. However, these two staff participants disagreed on their confidence level after training. Staff Participant One reported that they felt more confident implementing the protocol after BST training, while Staff Participant Two reported that they felt less confident. This discrepancy could be due to one of the participants being able to reach mastery criteria quickly and discontinue sessions after being exposed to BST on one occasion while the other participant required exposure to BST several times. During observations, the student evaluator noted that Staff Participant Two would

frequently make negative self-comments about themselves (i.e. “I can’t read this word,” or “I don’t know what I am doing.”) and required vocal prompts of encouragement (i.e. “You can do this,” or “You got this!”) from the student evaluator to implement the mindfulness-based protocol. Discrepancy in responses was also observed in the staff participant’s responses to their preference on the BST training compared to the agencies standard training practices (i.e. verbal teaching strategies). Staff Participant One reported that they preferred the standard training practices while Staff Participant Two reported that they preferred the BST training. In the future, the student evaluator will need to collect further information from staff and clients in regards to their opinions on mindfulness-based protocols to determine if these trainings are acceptable in community, residential settings with adults with intellectual disabilities.

One limitation of this evaluation is that it did not address the effects of increased treatment integrity of the mindfulness-based protocol had on the clients that the direct support staff support. The purpose of this evaluation was to determine the effects of the BST package on staff implementation. Future evaluation may consider the effects that increased treatment integrity of a mindfulness-based procedure has on these clients.

Another limitation that needs to be considered, is the impact the COVID-19 Pandemic had on this evaluation, such as, finite data collected by the student evaluator. Due to the COVID-19 Pandemic, staff participants and the student evaluator were required to follow the safety guidelines that were implemented by the state of Utah (i.e. wear face coverings, maintain social distancing practices, etc.) and by the service provider agency which impacted the number of session that could be conducted. This resulted in minimal observations and data collection opportunities. The COVID-19 Pandemic has been stressful for many people including direct support staff who work in community, residential settings. These stressors may impact how the

staff participants respond to the BST package, mindfulness-based protocol, and other job responsibilities that they have. Anecdotally, the student evaluator has data that shows that the implementation of the mindfulness-based protocol did not continue on shifts when the student evaluator was not present. This could be due to the additional stressors that direct support staff are experiencing due to the COVID-19 pandemic.

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## Appendices

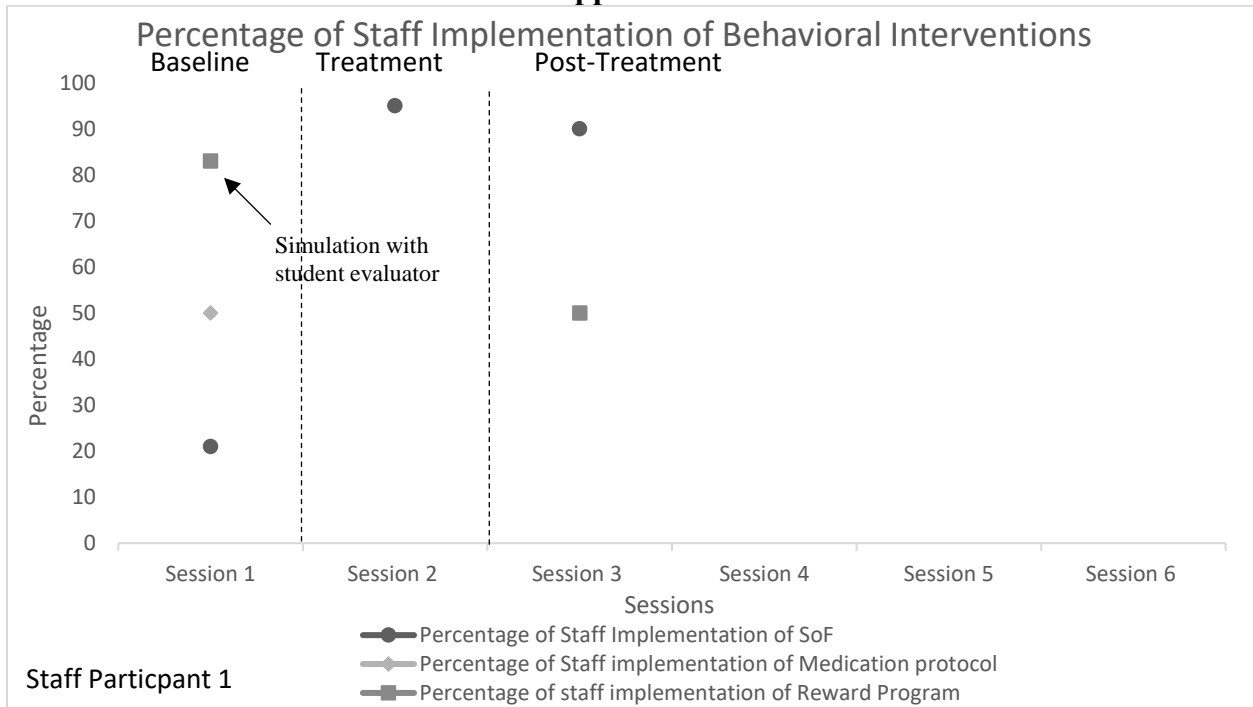


Figure 1. The effects of the intervention on percentage of correct implementation of the mindfulness-based protocol steps by Participant 1.

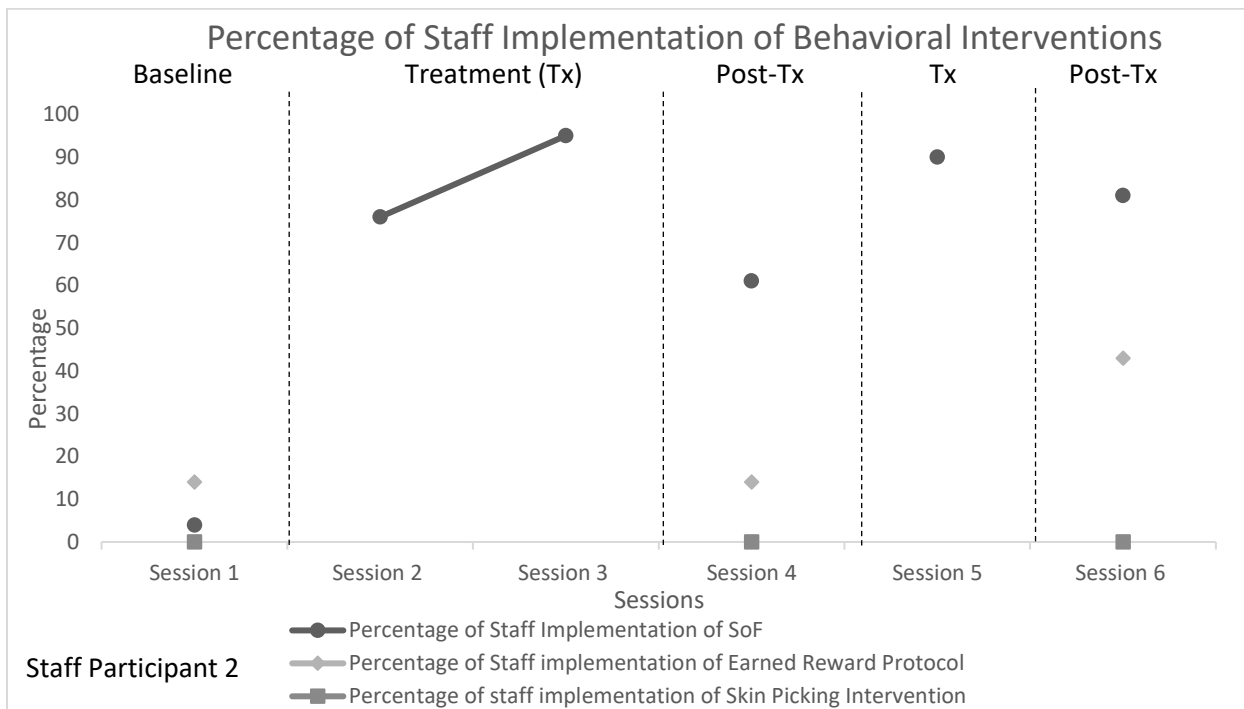


Figure 2. The effects of the intervention on percentage of correct implementation of the mindfulness-based protocol by Participant 2.

Appendix A: Direct Support Staff Background Questionnaire

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. How long have you worked for the community, residential provider agency?

2. How many hours do you work per week?

3. What is the highest degree or level of school you have completed?

- a) High School Graduate, diploma or the equivalent (GED)
- b) Some college credit, no degree
- c) Associate degree
- d) Bachelor's Degree
- e) Master's Degree
- f) Doctorate Degree

4. Have you received formal training in applied behavioral analysis (ABA)?

Yes No Not Sure

5. If yes, please describe your training in ABA:

6. Have you received formal training on mindfulness?

Yes No Not Sure

7. If Yes, please describe your training?

8. Do you practice mindfulness in your personal life?

Yes No Not Sure

9. If Yes, please describe how you practice mindfulness in your personal life.

## Appendix B: Mindfulness-Based Protocol

### 1. **Meditation on the Soles of the Feet Training**

1. Prior to prompting (Client's Name) to participate, ensure that you have access to the mindfulness-based training protocol, the data collection sheet, and a writing utensil.
2. At least one time per day, when (Client's Name) returns home from work or around 3:00 PM, prompt him/her to participate in his/her mindfulness-based training, *Meditation on the Soles of the Feet*. Say something like, "(Client's Name), it is time to do your training."
3. As soon as (Client's Name) is ready to participate in the training, prompt him/her to relocate to a quiet, private area where there are few distractions (e.g. his/her bedroom, the downstairs hangout room, a room with no other people that is quiet).
4. Pull out the mindfulness-based training protocol so that you may reference it when prompting (Client's Name) through the steps of the training. *This protocol is outlined below, as well as, in laminated form in the front tab of (Client's name's book and behind his/her behavior support plan in his book.*

### 5. **Steps of the training:**

- a. **Step 1:** Ask (Client's Name) if he/she would like to sit or stand for the training. Say something like, "For today's training would you like to sit or stand?"
  - i. Stand or sit directly across from (Client's Name) during this training so that you are able to model the steps of the training for him/her.
- b. **Step 2:** Discuss with (Client's Name) what he/she is learning when he/she practices *Meditation on the Soles of your Feet*. Say something like:
  - i. "You are practicing mindfulness so that you can learn to control your anger and the urge to be physically or verbally aggressive with others. When an incident occurs or a situation arises that typically makes you angry and you feel like either verbally threatening or hitting someone, it is important to control these feelings. We try not to threaten or hurt people when we disagree with them. *Angry thoughts occur to all of us but not all of us act on our angry thoughts.* There is a simple way of quickly calming yourself when you feel angry and we are going to practice that way now."
- c. **Step 3:** Prompt (Client's Name) through the following steps by vocally saying the remaining steps (i.e. the scripts that are in **bold**). If (Client's Name) does not appear to be doing the step correctly, implement the error correction procedure.
  - i. If he/she choose to sit for the training, say **"Sit comfortably and put the soles of your feet flat on the floor. Make sure your back is straight but not rigid. Rest your hands gently on your thighs or place them in your lap."**
  - ii. If he/she choose to stand for the training, say, **"Stand comfortably and put both feet on the ground with the soles of your feet flat on the floor. Make sure that your back is straight but not rigid. Relax your body, face, and hands. Let your hands hang to your side."**
    1. Error Correction: Assess how (Client's Name) is doing in terms of posture by looking at him/her. If he/she is not sitting or standing still (e.g. moving around, fidgeting, holding onto cell phone, etc.), prompt him/her to sit/stand like you and demonstrate how he/she

should sit or stand (e.g. sit up or stand up straight in a relaxed manner, rest your hands gently on your thighs, let your hands hang to your side)

- iii. **“If you feel comfortable, close your eyes. If you do not, soften your gaze by focusing your eyes on an object in the room that does not move.”**
  1. Error Correction: Observe how (Client’s name)’s eyes are by looking at him/her. If he/she is looking around, blinking rapidly, squinting as if forcing eyes to focus, etc. prompt him/her to watch how your eyes are. Say something like, “I can see that you are having a hard time focusing your eyes. Watch how I do it.” Model closing your eyes or identifying an object in the room and focusing your gaze on the object. “See how my eyes are closed? Or “See how my gaze is focused on one object and not moving around the room? Can you do that too?” Observe (Client’s Name) until his/her eyes are closed or his/her gaze is focused.
- iv. **“Breathe naturally, and do nothing.”**
  1. Error Correction: Observe how (Client’s Name) is breathing. If you feel that his/her breathing has changed and that it is not natural for him/her (e.g. breathing heavily, breathing is forced, continuously clearing throat, etc.), prompt him/her to watch you as you breathe. Say something like, “I can see that you are having some trouble breathing naturally. Watch how I do it.” Model natural relaxed breathing for him/her and then say, “See how I am relaxed, breathing through my nose steadily? Can you do that too? Breathe with (Client’s Name) until his/her breathing is natural.
- v. **“Cast your mind back to an incident that made you very angry.”**
  1. Allow (Client’s Name) to think of an incident that made him/her angry. Give him/her about 5-15 seconds.
- vi. After about 5-15 seconds, prompt (Client’s Name) to tell you about the angry situation. Say something like, **“tell me about the situation that made you angry.”**
  1. Listen to him/her. When he/she is done telling you about the situation, prompt him/her to think about this situation as you walk them through the remaining steps of the training. Say something like, **“now think about this situation as we finish the training.”**
  2. Error Correction: If (Client’s Name) says, “I can’t think of a situation that made me angry,” or “I don’t know.”
    - a. Identify an incident for them where they became angry and engaged in verbal or physical aggression. Say something like, “Remember yesterday when you became upset at your housemate for not washing the dishes? You started yelling at them and became angry. Let’s think of that situation as we continue this training.”

- vii. **“Stay with that anger. You are feeling angry, and angry thoughts are flowing through your mind. Let them flow naturally, without restriction. Stay with the anger. Your body may show signs of anger.”**
    - 1. Give (Client’s Name) about 5-15 seconds to stay with the angry situation.
  - viii. **“Now, shift all your attention to the soles of your feet.”**
  - d. Continue with the next prompts (i.-iv.) slowly (at least 1 breath between each prompt in a low tone of voice.
    - i. **“Slowly, move your toes.”**
    - ii. **“Feel the floor with the soles of your feet.”**
    - iii. **“Feel the curve of your arch.”**
    - iv. **“Focus on the heels of your feet.”**
      - 1. If (Client’s Name) is wearing shoes and/or socks, include the following verbal prompts:
        - a. **“Feel your shoes covering your feet.”**
        - b. **“Feel the texture of your socks”**
        - c. **“and the heels of your feet against the back of your shoes.”**
  - e. **“Keep breathing naturally and focus on the soles of your feet until you feel calm.”**
    - i. Observe (Client’s Name) until he/she shows signs of being calm (e.g. breathing is steady, hands are open (not clenched), they are smiling gently, etc.)
    - ii. When (Client’s Name) is done with the training, he/she will let you know (i.e. will open eyes, will be alert, will say, “I am done.” etc.)
6. **Step 4:** As soon as (Client’s Name) is done with the training, praise him/her. Say something like, “It is really great that you were able to practice mindfulness to help keep you calm! Way to go!”
7. **Step 5:** Immediately collect data on the data collection sheet.

Adapted from the *Meditation on the Soles of the Feet for Anger Management: A Trainers Manual* (Singh, N., Singh, J., Singh, A., Singh, A. N., & Winton) and *Soles of the Feet: a Mindfulness-Based Self-Control Intervention for Aggression by an Individual with Mild Mental Retardation and Mental Illness* (Singh, Wahler, Adkins, & Myers.)

Appendix C: Soles of the Feet Data Collection Sheet

Client Name:	Session Number:
Direct Support Staff Name:	Session Date:
Data Collector:	Treatment Integrity:

Data Collection Key:

+ = implemented correctly; -- = implemented incorrectly NA= did not implement step or step not observed during the session

Session	1	2	3	NOTES
Date				
Data collectors initial				
<b>Implementation by Direct Support Staff</b>				
1	Staff participant has training materials ready (Mindfulness-based protocol, data collection sheet, writing utensil)			
2	Staff participant provides a vocal prompt to client to participate in the Mindfulness-Based Protocol (MBP)			
3	Staff participant supports the client to participate in MBP in a quiet location with few distractions			
4	Staff participant locates the written protocol			
5	Staff participant vocally prompts the client to sit or stand for the training			
6	Staff participant stands/sits directly in front of participant and faces them			
7	Staff participant vocally prompts the client to review why they are learning this skill (i.e. to control the urge to be verbally and physically aggressive, control anger).			

8	<ul style="list-style-type: none"> <li>• <b><u>If the client chooses to sit,</u></b> staff participant vocally prompts the client to sit comfortably with their feet flat on the floor.</li> <li>• <b><u>If the client chooses to stand,</u></b> staff participant vocally prompts the client to stand in a natural rather aggressive posture with the soles of their feet flat on the floor.</li> </ul>				
9	Error correction for posture implemented (if needed) by saying “sit/stand like me” and demonstrate appropriate posture				
10	Vocally prompts the client to close their eyes or soften their gaze				
11	Error correction for closing eyes: by saying “Close your eyes like me.” And shows how to close eyes or prompts them to soften their gaze and focus on an object 4- 6 feet away.				
12	Vocally prompts the client to “Breathe naturally, and do nothing.				
13	Error correction for breathing naturally: Vocally prompts client to watch you as you breathe naturally				
14	Vocally Prompts the client to “Cast your mind back to an incident that made you very angry.”				
15	Wait 5--15 seconds to allow the client to think of a situation that made them angry				
16	Vocally prompts the client to tell them about the situation that made them angry				
17	Error Correction: If the client says I don’t know or does not identify a situation that made them angry, staff participant identifies a situation for them.				
18	Vocally prompts the client to “Stay with that anger. You are feeling angry, and angry thoughts are flowing through your mind. Let them flow naturally, without restriction. Stay with the anger. Your body may show signs of anger.”				



19	Observes client for about 5--15 seconds looking for signs of anger				
20	Vocally prompts the client to “Now, shift all your attention to the soles of your feet.”				
21	<ul style="list-style-type: none"> <li>• Slowly (1 breath between each prompt) prompts the client through different sensations on the soles of the feet (i.e., “Slowly, move your toes, feel the floor with the soles of your feet, and feel the curve of your arch, focus on the heels of your feet.”</li> <li>• If the client participant is wearing shoes or socks, vocally prompts client to “feel your shoes covering your feet, feel the texture of your socks and the heels of your feet against the back of your shoes.”</li> </ul>				
22	Vocally prompts the client to continue to stay in the soles of feet (“Keep breathing naturally and focus on the soles of your feet until you feel calm.”)				
23	Vocally praises the client for participating in training				
24	Correctly collects data within five minutes of prompting the client through the MBP				
% of steps implemented correctly:		%	%	%	

## Appendix D: BST Role-Playing Script

- i. **Step 1:** Provide **rationale** for the mindfulness-based protocol being trained.
  - a. “Today we are going to learn how to implement (*Client’s Name*)’s mindfulness-based protocol, *Meditation on the Soles of the Feet*. This skill is important for (*Client’s Name*) to learn because it can help him/her learn to control their anger. It can help him/her to calm down quickly so that he/she can respond appropriately to the situation that made them angry.”
- ii. **Step 2:** Vocally **describe** steps of the target skill.
  - a. Vocally Describe: “The purpose of this training is to teach (*Client’s Name*) to identify situations that are triggers to angry outburst and physical aggression and then to guide them through a mindfulness-based training that will shift their attention from an aggressive interaction or trigger to the soles of their feet, which is a neutral part of their body.”
- iii. **Step 3:** Provide **written instructions** of the *Meditation on the Soles of the Feet* training protocol.
  - a. Provide staff with the written instructions of the *Soles of the Feet* Training protocol.
  - b. Read the *Soles of the Feet* Training protocol out loud to the direct support staff.
  - c. Ask the direct support staff if they have any questions about the *Soles of the Feet* Training protocol.
    - i. If they have questions, answer the questions to the best of your ability.
    - ii. If they do not have questions, move on to step 3.
- iv. **Step 3:** **Demonstrate** the mindfulness-based protocol.
  - a. Vocally prompt the direct support staff to role-play the *Soles of the Feet* training.
    - i. Say something like, “Now we are going to role-play the *Soles of the Feet* training so that you can see what it looks like. I will play the role of staff, while you will play the role of (*Client’s Name*).”
  - b. Vocally prompt the staff role playing with you to participate in the *Soles of the Feet* protocol.
    - i. Say something like, “Hey, (*Client’s Name*) it is time to practice your *Soles of the Feet* protocol, would you like to practice here or in your bedroom?”
    - ii. Assist the staff role playing with you to relocate to another room if needed or role-play in the simulated environment as if you relocated to another room or area. Preferably a room or area that is quiet and has few distractions.
  - c. Pull out the *Soles of the Feet* Training Protocol and model Step 1 through Step 5 with the staff that you are role playing with.
  - d. As soon as you have completed modeling the steps of the training correctly to the staff role playing with you, ask them if they have any questions.
    - i. If they do not have any questions, move on to Step 4.
    - ii. If they have questions, answer the questions to the best of your ability.
- v. **Step 4:** Have staff practice performing the target skill.
  - a. After demonstrating the skill for staff, vocally prompt them to demonstrate the skill to you.
    - i. Say something like, “Now that you have seen how to implement the protocol with (*Client’s Name*), it’s your turn to show me. You will play the role of staff

(you) and I will play the role of (*Client's Name*). I will observe you as you implement the protocol.”

- ii. As staff are demonstrating the skill, implement step 5.
- vi. **Step 5:** Observe and record staff's correct vs incorrect performance of the target skill.
  - a. Collect data on the *Soles of the Feet* data collection sheet (see Appendix D). This sheet will be used to provide corrective and supportive feedback to the staff.
- vii. **Step 6:** Provide supportive and corrective feedback.
  - a. Use the *Soles of the Feet* data collection sheet to provide feedback to the staff.
  - b. Ensure that the staff demonstrated all components of the steps.
    - i. If they did not demonstrate a step or left a step out, the step will be scored incorrect and corrective feedback will be provided.
    - ii. If a step was not applicable and they implemented the step, corrective feedback will be provided.
    - iii. If a step was applicable and they implemented the step well, supportive feedback will be provided.
  - c. Feedback will be provided using a set format (Parsons and Reid, 1995)
    - i. Beginning the feedback with a positive or empathetic statement,
    - ii. Specifying what the participant performed correctly,
    - iii. Specifying what the participant performed incorrectly (If applicable)
    - iv. How to correct the incorrect performance (if applicable)
    - v. Asking the staff if they have any questions about their feedback
    - vi. Informing the staff if future sessions would be conducted
    - vii. Ending the feedback on an overall positive statement
- viii. **Step 7:** Repeat steps 4, 5, and 6 until staff meets mastery criteria of the skill.

Appendix E: BST Data Collection Sheet

Client Name:	Session:
Direct Support Staff Name:	Session Date:
Data Collector:	Treatment Integrity:

Data Collection Key:

+ = implemented correctly; -- = implemented incorrectly NA= did not implement step or step not observed during the session

Session		1	2	3	NOTES
Date					
Data collectors initial					
<b>BST Steps:</b>					
1	Student evaluator has training materials ready (Mindfulness-based protocol, data collection sheet, writing utensil)				
2	Student evaluator provides a rationale for the MBP being trained				
3	Student evaluator provides a vocal description of the target skill				
4	Student evaluator provides written instructions of the protocol				
5	Student evaluator vocally reads through each step of the protocol				
6	Student evaluator asks if the staff have questions about the written instructions				
7	If yes, answers their questions				
8	Student evaluator vocally prompts the direct support staff to role-play the protocol with them with <b><u>the student evaluator playing the part of staff</u></b> and the staff playing the role of the client				
<b>Mindfulness-Based Protocol Steps:</b>					
9	Staff participant has training materials ready (Mindfulness-based protocol, data collection sheet, writing utensil)				

10	Staff participant provides a vocal prompt to client to participate in the Mindfulness-Based Protocol (MBP)				
11	Staff participant supports the client to participate in MBP in a quiet location with few distractions				
12	Staff participant locates the written protocol				
13	Staff participant vocally prompts the client to sit or stand for the training				
14	Staff participant stands/sits directly in front of participant and faces them				
15	Staff participant vocally prompts the client to review why they are learning this skill (i.e. to control the urge to be verbally and physically aggressive, control anger).				
16	<ul style="list-style-type: none"> <li>• <b><u>If the client chooses to sit,</u></b> staff participant vocally prompts the client to sit comfortably with their feet flat on the floor.</li> <li>• <b><u>If the client chooses to stand,</u></b> staff participant vocally prompts the client to stand in a natural rather aggressive posture with the soles of their feet flat on the floor.</li> </ul>				
17	Error correction for posture implemented (if needed) by saying “sit/stand like me” and demonstrate appropriate posture				
18	Vocally prompts the client to close their eyes or soften their gaze				
19	Error correction for closing eyes: by saying “Close your eyes like me.” And shows how to close eyes or prompts them to soften their gaze and focus on an object 4- 6 feet away.				
20	Vocally prompts the client to “Breathe naturally, and do nothing.				
21	Error correction for breathing naturally: Vocally prompts client to watch you as you breathe naturally				
22	Vocally Prompts the client to “Cast your mind back to an incident that made you very angry.”				
23	Wait 5--15 seconds to allow the client to think of a situation that made them angry				
24	Vocally prompts the client to tell them about the situation that made them angry				
25	Error Correction: If the client says I don’t know or does not identify a situation that made				

	them angry, staff participant identifies a situation for them.				
26	Vocally prompts the client to “Stay with that anger. You are feeling angry, and angry thoughts are flowing through your mind. Let them flow naturally, without restriction. Stay with the anger. Your body may show signs of anger.”				
27	Observes client for about 5--15 seconds looking for signs of anger				
28	Vocally prompts the client to “Now, shift all your attention to the soles of your feet.”				
29	<ul style="list-style-type: none"> <li>• Slowly (1 breath between each prompt) prompts the client through different sensations on the soles of the feet (i.e., “Slowly, move your toes, feel the floor with the soles of your feet, and feel the curve of your arch, focus on the heels of your feet.”</li> <li>• If the client participant is wearing shoes or socks, vocally prompts client to “feel your shoes covering your feet, feel the texture of your socks and the heels of your feet against the back of your shoes.”</li> </ul>				
30	Vocally prompts the client to continue to stay in the soles of feet (“Keep breathing naturally and focus on the soles of your feet until you feel calm.”)				
31	Vocally praises the client for participating in training				
32	Correctly collects data within five minutes of prompting the client through the MBP				
33	Student evaluator asks if the staff have questions about demonstration/model.				
34	If yes, answers their questions				
35	Vocally prompts staff to demonstrate the MBP with the secondary data collector playing the role of the client and the staff playing the role of staff				
36	Student evaluator observes and records staff’s correct/incorrect performance of skill				
37	Accurately collects data on correct/incorrect performance of skill				

38	Student evaluator provides feedback to staff (refers to the mindfulness-based data collection sheet)				
39a	Beginning the feedback with a positive or empathetic statement,				
	Specifying what the participant performed correctly,				
	Specifying what the participant performed incorrectly (If applicable)				
	How to correct the incorrect performance (if applicable)				
	Asking the staff if they have any questions about their feedback				
	Informing the staff if future sessions would be conducted				
	Ending the feedback on an overall positive statement				
40	Repeats steps 4, 5, and 6 of the MBP until staff meets mastery criteria.				
% of steps implemented correctly:		%	%	%	

Appendix F: Social Validity Direct Support Staff Participant Questionnaire

	Strongly Disagree	Disagree	Slightly Agree	Agree
Mindfulness-Based Protocol	1	2	3	4
1. I enjoy implementing the <i>Soles of the Feet</i> training with my client.				
2. <i>Soles of the Feet</i> is a good training for other clients to learn.				
3. Doing the <i>Soles of the Feet</i> training with my client is too hard.				
4. There are better trainings to help my client build skills than <i>Soles of the Feet</i> training.				
5. I could use the skills that I learned in <i>Sole of the Feet</i> training in my personal life.				
6. My client is better able to control his/her anger now that they can use <i>Soles of the Feet</i> .				

	Strongly Disagree	Disagree	Slightly Agree	Agree
Behavioral Skills Training	1	2	3	4
1. During training I learned how to implement <i>Soles of the Feet</i> with my client quickly.				
2. I feel more confident implementing <i>Soles of the Feet</i> training with my client after training.				
3. I prefer the training that was used in this evaluation (BST) better than the agencies standard training practices (i.e. verbal teaching strategies).				
4. My understanding of <i>Soles of the Feet</i> is clearer because of the training I received.				