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## Implementing Behavior Analysis and Intervention for Individuals with Cognitive Impairments in Skilled Nursing Facilities: Summary of Results

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**Implementing Behavior Analysis and Intervention for Individuals with Cognitive  
Impairment in Skilled Nursing Facilities: Summary of Results**

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## Summary of Purpose

The purpose of the project was to provide behavioral consultation and services to aging persons with cognitive impairment at skilled nursing facilities in Michigan. The goal was to use empirically supported non-pharmacological approaches to reduce behavioral and psychological symptoms of dementia (BPSD; wandering, agitation, disruptive vocalizations, etc.) and help slow down or remediate lost skills, reduce the use of medication to manage BPSD, to improve staff knowledge and abilities, and to develop modules that can be adopted and used by other skilled nursing facilities. The project was led by Dr. Janet Hahn, a social gerontologist with extensive experience studying nursing home culture change and the quality of long-term care services. The intervention project team consisted of doctoral, masters and undergraduate level behavior analysts with advanced training in working with aging populations, under the direction of Dr. Jonathan Baker (doctoral level board certified behavior analyst and behavioral gerontologist).

The project was funded by the Civil Money Penalties fund of the *Michigan Department of Health and Human Services* from May 2016 and to April 2019. The project was conducted with oversight by the Western Michigan University Human Subjects Institutional Review Board, under approved protocol HSIRB Project Number 16-09-07, titled *Implementing Behavior Analysis and Intervention for Individuals with Cognitive Impairment in Skilled Nursing Facilities*.

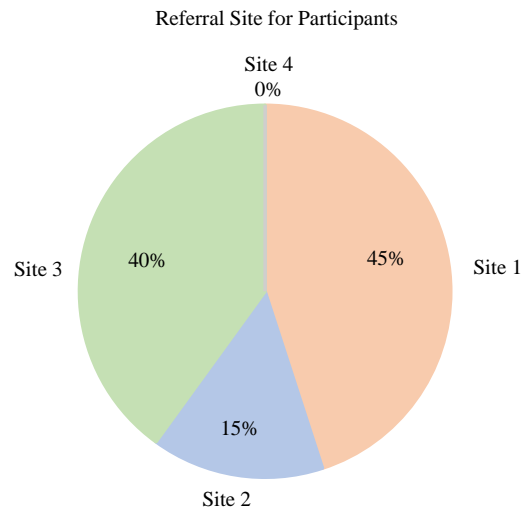
### **Referral and Consent Form Process**

Four skilled nursing facilities were recruited for this project. At each facility, the research team met with case management to describe the inclusion criteria for participation. Inclusion criteria included residents who had a progressive cognitive impairment (as indicated in their medical records and cognitive screens), engaged in BPSD (as indicated by staff), resided in the facility for more than 30 days, and had a legal authorized representative. The case manager identified a list of potential participants and mailed a flyer outlining the purpose of the project to the legal authorized representatives. If the legal authorized representative was interested in obtaining more information about the project, then they were encouraged to call the research team to review the consent form either in person or by phone. The researchers handed out more consent forms by mail and in person than the number of consent forms that were returned. Data on the number of consent forms sent out and the number returned were not gathered because those who did not return the consent form were not part of the study. The researchers did not begin working with a resident until written consent was obtained.



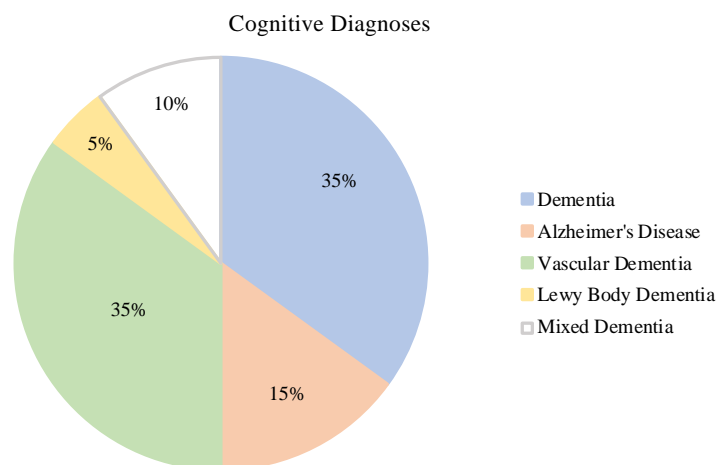
## Demographic Information

Four skilled nursing facilities were recruited and 20 participants completed the consent process across all facilities. The majority of participants were recruited from sites 1 and 3. See Figure 1 for a breakdown of the percentage of participants recruited per facility.



*Figure 1.* Breakdown of the percentage of participants recruited at each skilled nursing facility.

Upon review of each participant's medical record, the majority of participants were diagnosed with either vascular dementia or dementia (i.e., unspecified dementia, dementia with behavioral disturbance, and dementia without behavioral disturbance). Two participants were diagnosed with mixed dementia (i.e., vascular dementia and Alzheimer's disease). See Figure 2 for a breakdown of cognitive diagnoses.



*Figure 2.* Breakdown of cognitive diagnoses across participants.

Additional demographic data (i.e., age, gender, educational level, funding source, scores on cognitive screens, and unit in facility) are displayed in Table 1. The research team assigned a number to each participant to ensure privacy and confidentiality. The numbers were randomized across all sites; thus, the order of the assigned participant numbers do not correspond to the order of facility recruitment.

Table 1  
*Participant Demographics*

Participant	Age	Gender	Funding Source	Cognitive Screen Score		Unit in Facility	
				BIMS	SLUMS	Intake	Discharge from Study (if different)
1	72	Male	Medicare		N/A	LTC	
2	67	Female	Medicaid	N/A	N/A	LTC	
3	91	Male	Private pay	10	N/A	LTC	
4	64	Male	Unknown	N/A	N/A	Memory	Behavior
5	57	Female	Medicaid	15	N/A	LTC	
6	97	Female	Private pay	3	N/A	LTC	
7	75	Male	Medicare	11	N/A	Behavior	LTC
8	87	Female	Medicaid	9	N/A	Memory	
9	81	Female	Medicare	2	N/A	LTC	
10	74	Male	Medicare	15	N/A	Behavior	LTC
11	76	Male	Medicaid	N/A	N/A	Memory	
12	77	Female	Medicare	N/A	N/A	Memory	
13	82	Female	Medicaid	3	13	LTC	
14	85	Male	Medicare	5	13	LTC	
15	87	Female	Medicaid	2	N/A	Memory	LTC
16	64	Female	Unknown	N/A	N/A	LTC	
17	89	Female	Medicaid	1	N/A	Memory	LTC
18	89	Female	Medicare	N/A	N/A	Memory	
19	85	Female	Unknown	13	N/A	LTC	
20	95	Female	Medicaid	N/A	N/A	LTC	

LTC = Long-term Care

As indicated in the table, the majority of participants were female ( $n = 13$ ), and ages ranged from 57-97 years. The Brief Interview of Mental Status (BIMS) was used to determine a participant's level of functioning, as all facilities utilized the BIMS in their intake. The BIMS measures attention, orientation, ability to register, and ability to recall new information. Scores range from 0 to 15, with scores of 13-15, 8-12, and 0-7 suggesting no cognitive impairment, moderate impairment, or severe impairment, respectively. While the BIMS was completed with most participants, some did not have BIMS score (as indicated by N/A) because the participant could not attend to the questions due to a loss in receptive and expressive language.

For some participants, case management or with the research team completed the Saint Louis Mental Status (SLUMS) Examination. Compared to the BIMS, the SLUMS is a more thorough screening tool, as it measures attention, orientation, immediate recall, registration, visual spatial and executive functioning, and numeric calculation. The SLUMS score can be adjusted for education level. For instance, if an individual had a high school education, a score of 27-30, 21-26, and less than 21 suggests normal functioning, mild neurocognitive disorder, and dementia range, respectively. If the individual had less than high school education, then a score of 25-30, 20-24, and less than 24 suggests normal functioning, mild neurocognitive disorder, and dementia range, respectively. The research team did not conduct the SLUMS with each participant, as the SLUMS requires that individuals can write (i.e., to complete the clock face drawing test) and several of our participants no longer had the fine motor skills to hold a writing utensil. The research team also did not conduct the SLUMS with participants who had a loss of receptive and expressive language.

Table 2 provides the reasons for referral (i.e., target behaviors) for each participant. As indicated in the table, several participants were referred for behaviors that are often categorized as verbal agitation or disruptive vocalizations (e.g., yelling, screaming, repetitive statements), verbal aggression (e.g., threatening statements, name calling), and physical aggression (e.g., kicking, hitting, pinching).

Table 2  
*Reason for Referral per Participant*

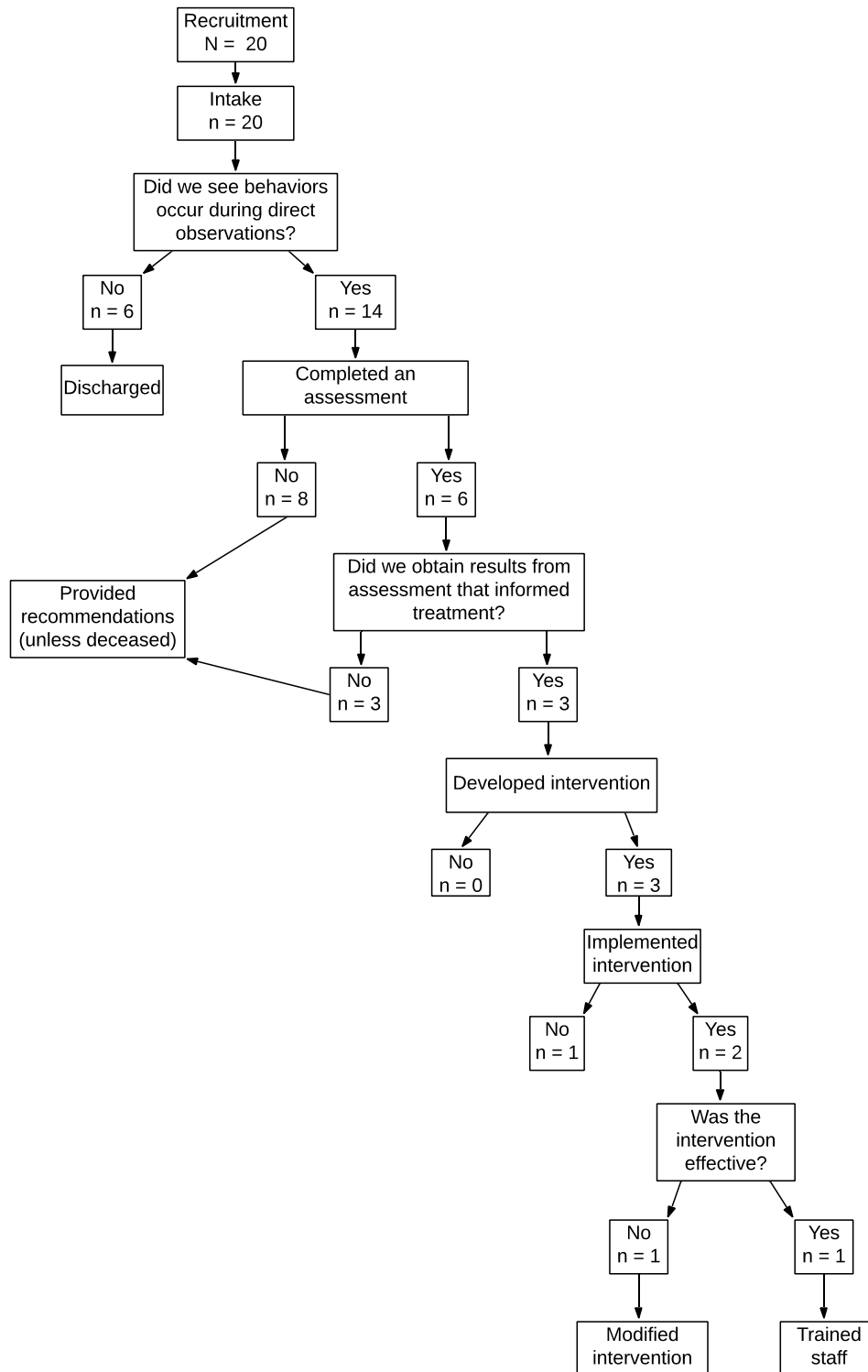
Participant Code	Reason for Referral
1	Inappropriately touching staff
2	Yelling, screaming, hitting, and pinching
3	Taking other residents' food and drinks
4	Yelling, throwing items, and raising arms with fist in staffs' face
5	Whining
6	Yelling, name calling, and hitting
7	Threatening statements, racial slurs, and delusional speech
8	Crying and screaming
9	Yelling and screaming
10	Screaming, throwing items, shaking the bed, and delusions
11	Spitting

Table 2  
*Reason for Referral per Participant (cont.)*

Participant Code	Reason for Referral
12	Disrobing and repeatedly sitting on the floor
13	Elopement
14	Refusing care, yelling, and repeatedly asking for his wife and to go home
15	Non-reality speech, exit seeking, property destruction, pinching staff, yelling, and crying
16	Obsessions over phone, computer, food, roommates, and calling guardian
17	Yelling, name calling, hitting, and kicking
18	Yelling, name calling, hitting, and taking items from other residents, nurse's cart, and food cart
19	Refusing to sleep, yelling at staff, residents, and husband
20	Yelling, sexually inappropriate comments, hitting self, and hitting others

## **Summary of Process**

Once the legal authorized representative provided written consent, the researchers reviewed each participant's medical record to gather information related to the participant's medications, medical and cognitive diagnoses, staff progress notes on behaviors, history of the behavior, and demographic information (as indicated above). Following a review of the medical records, the researchers conducted a functional behavior assessment, which consisted of interviews with staff members and/or family, direct observations, and assessment (e.g., to determine preference for items, to identify why the behavior was occurring). Results from the functional behavior assessment informed the development of an intervention. When an intervention was developed, the researchers implemented the intervention and monitored for effectiveness. Once desirable results were obtained, the researchers trained staff on the intervention. During the last three years, not all participants completed each phase of the study. See Figure 3 for a visual representation of how many participants entered each phase of the study. A description for each participant is outlined in the "Summary of Results" section below.



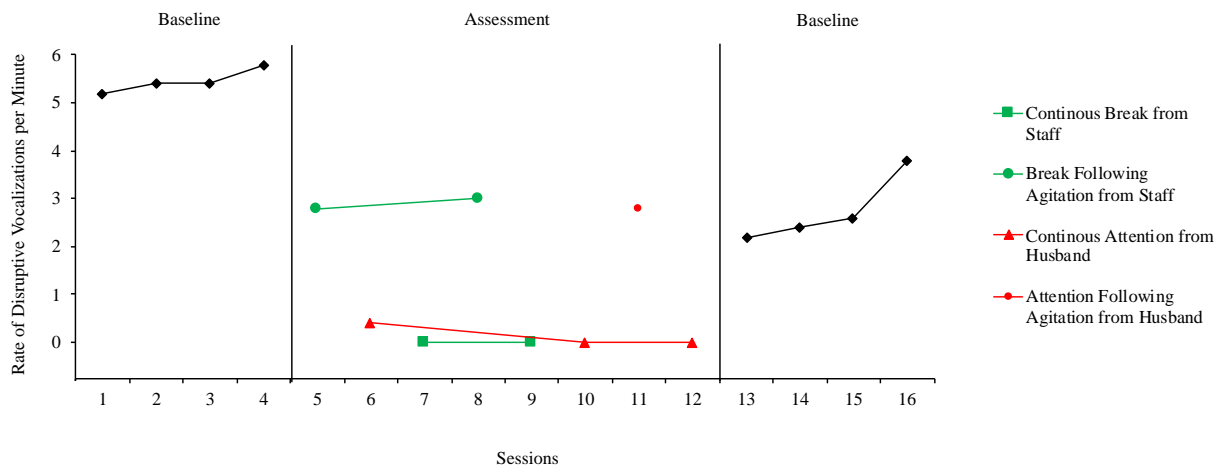
*Figure 3.* The flow chart depicts the number of participants that entered each phase of the project.

## Summary of Results

### **Proposed Outcomes A and B: 50% Reduction in Verbal Agitation, Non-verbal Agitation, and BPSD**

The first two goals of this project were to decrease verbal, non-verbal agitation, and BPSD by 50% (specifically, a 50% reduction in the mean baseline level of behavior when compared to the mean level of the final treatment evaluation). As demonstrated in Figure 3, not all participants completed each phase of the study; thus, this goal was not met for every participant. Participants are categorized into the following categories: 1) we demonstrated a 50% reduction in the target behavior, 2) we demonstrated a 50% increase in skills, 3) we saw instances of the target behavior, but we did not make it to assessment, 4) we saw instances of the target behavior, made it to assessment, and provided recommendations, 5) we saw instances of the target behavior, did not complete assessment, and provided recommendations, 6) we did not see instances of the target behavior, 6) participants were not a good fit for services, and 7) participants passed away. A description of each category is described below.

***Reduction of the target behavior.*** We saw a 50% reduction of BPSD for two of the three participants that made it to either the assessment or intervention phases. Participant 9's target behavior was verbal agitation during bathing routines. During her bathing routines, her husband was always present. Thus, the researchers worked with the participant's staff member and husband. To identify the reason for why the target behavior was occurring, the researchers conducted a functional analysis in which they coached the husband and the staff member to conduct the following conditions: 1) staff member provided a 10-second break from the care (e.g., staff member moved shower head off of participant) after each instance of the target behavior, 2) her husband provided continuous attention and no care was started, 3) the staff member provided continuous attention and no care was started, and 4) and her husband provided attention after each instance of the target behavior. In a functional analysis, the condition with a higher rate of the target behavior when compared to control conditions (e.g., providing attention and not conducting care) is determined to demonstrate why the behavior occurs. Results of the functional analysis identified that the participant engaged in verbal agitation during the conditions in which staff provided a 10-second break and when the husband provided attention. See Figure 4 for results. In comparison to the first baseline, there was nearly a 50% reduction across all conditions, with a nearly 100% reduction when staff did not provide demands (i.e., the care task) and when her husband provided continuous attention. That is, when the participant did not have to engage in the target behavior to receive a break or attention, the behavior essentially stopped. We conducted a second baseline phase because a new staff member began working with the participant, and we wanted to see if high rates of the behavior would continue occur. In comparison to the first baseline, there is a lower rate of the behavior, but we do start to see the rate increase across sessions. The results from the assessment informed treatment, in which we would have trained the staff member and husband to provide a 10-second break and attention every 30 seconds. We have evidence to support that this intervention would have resulted in at least a 50% reduction (as the brief assessment demonstrated nearly 100% reduction), but we were unable to carry out the intervention because the participant passed away.



*Figure 4.* The rate of verbal agitation per minute during baseline and assessment. Rate was calculated by dividing the number of times the behavior occurred by the length of the session (i.e., 5 minutes). Conditions led by the husband are red, and conditions led by the staff member are in green.

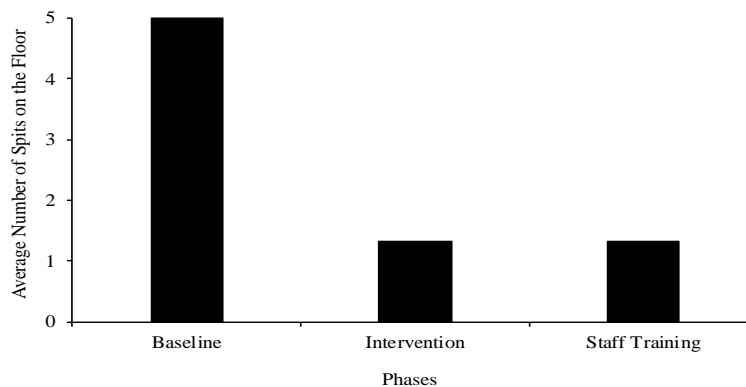
Participant 11 engaged in spitting on the floor during mealtimes. We conducted a functional assessment to determine whether food, drinks, or a combination of both triggered the behavior. During the assessment, we recorded how often the participant would spit when he had access to only food, access to only drinks, or access to food and drinks. Results revealed higher rates of spitting per minute when he had access to food and drinks. Thus, the intervention was conducted during mealtimes because this is when he would reliably have access to both. Prior to baseline, staff reported that there was another resident who spit in unit; however, this was not a concern because the resident spit in a trashcan when a trashcan was placed next to her. They reported that this was socially appropriate. Therefore, we determined that the goal of the intervention would be to teach him to spit in a trashcan. During baseline, we placed a trashcan on both sides of the participant and recorded how often he would spit in the trashcan and on the floor. Following baseline, we sat next to him. As the participant began to lean to the left or right, we pointed to the trashcan. If he spit in the trashcan, we smiled, provided eye contact, and nodded. If he did not spit in the trashcan, then we did not provide attention. We saw a decrease in the number of spits on the floor, an increase in the number of spits in the trashcan, and identified that the trashcan needed to be level with the table. Thus, we created two trashcans out of PVC pipe, and these were used for the remainder of the study. See Figure 5 for a picture of the trashcan.





*Figure 5.* Picture of the new trashcans.

With the new trashcans, we gradually removed how often we pointed to the trashcan, how often we provided social attention after he spit in the trashcan, and we removed ourselves from sitting next to him. After all gestures, attention, and researchers were removed, we continued to collect data on how often he would spit on the floor and in the trashcan. Once 90% of his spits were in the trashcan, we trained staff on how to set up the trashcans and continued to observe how often he would spit on the floor. During baseline, the participant spit an average of 5 times on the floor during an average of 35-minute meal. See Figure 6 for a visual representation of the data. The participant spit on average 1.32 times and 1.33 times per meal during the intervention and after staff set up the trashcans, respectively. These data suggest that the intervention was successful in reducing the number of times he would spit on the floor and results maintained after staff were trained.



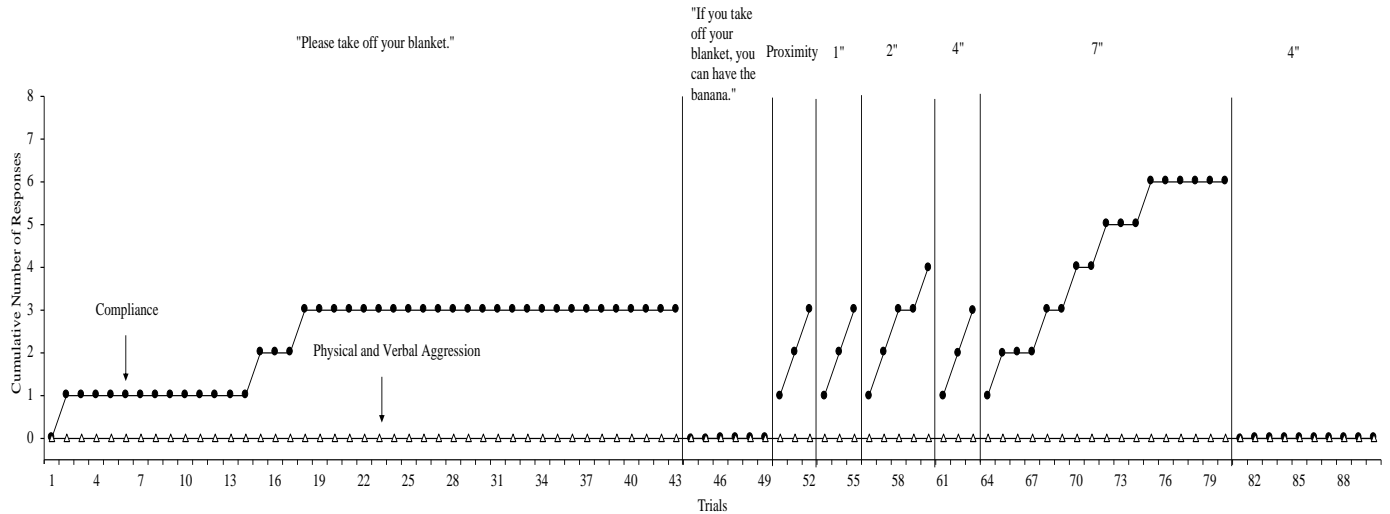
*Figure 6.* The average number of spits on the floor during meals in each phase of the study.

Participant 18 engaged in physical and verbal aggression towards staff during her care routines. We do not have baseline data because we could not coordinate with staff to take her to the bathroom when we were there to observe. We also attempted to conduct a functional analysis to determine why the behavior was occurring. This assessment included the following conditions: 1) staff member provided a 10-second break from the care (e.g., staff member stopped washing the participant) after each instance of the behavior, 2) staff member providing continuous attention and no care was started, 3) staff member sang to the participant after each instance of the behavior, and 4) staff member explained the next step of the care to the

participant after each instance of the behavior. However, we were unable to complete this assessment. The participant did not require full assistance with her cares, but she did require assistance maintaining her hygiene (e.g., washing self, washing hands). During the care, when the participant engaged in the behavior and staff provided a 10-second break, the participant pulled her pants back up before staff could wash her. This required the staff member to pull her pants back down to wash her. It is likely that this increased the aversiveness of the task and potentially increased the participant's distress. Therefore, we stopped the assessment and began intervention.

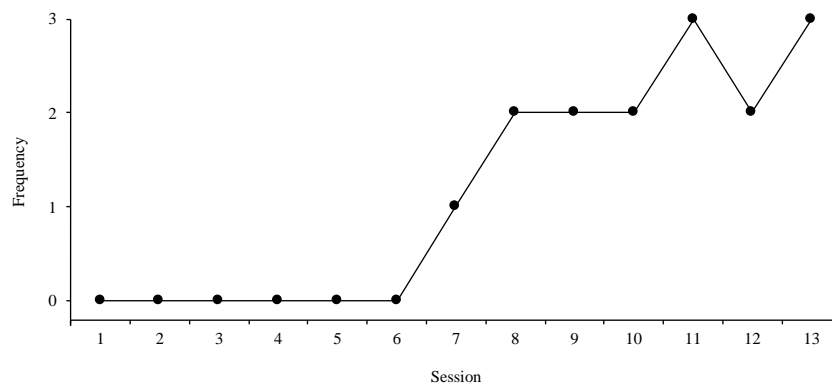
Given that we could not change the task, we wanted to decrease the aversiveness of the care. Based on our observations, we hypothesized that the participant engaged in these behaviors to get a break from the care/staff, and we observed that the behaviors began when staff approached the participant while she was lying in bed. However, to decrease the aversiveness of the care, we needed to first establishing a new history of complying with simple tasks so we could then expose her to the less aversive version of the care task (i.e., staff only presented demands when they were going to do the care task, so this had become the signal that the task was coming and led to the target behavior). We began with an assessment to determine the participant's preference for snack items and identified bananas as a preferred snack. We then broke down the care task of going to the bathroom into multiple steps (take off blanket, sit up in bed, hang feet over bed, etc.). While the participant was lying in bed, we provided the instruction, "Please take off your blanket", the first step in the chain. If she complied with the step and did not engage in the target behaviors, she received a piece of a banana and we provided 5-minute break (thus breaking the relationship of demand and aversive care task). If she did not comply or if she engaged in the target behaviors, she did not receive a piece of a banana and only a 15-second break. This was ineffective, as the participant did not comply during several trials. See Figure 7 for a visual representation of the graph. In efforts to increase compliance, we rephrased the instruction and presented it as a rule (i.e., "if you take off your blanket, you can have a piece of the banana"). This also proved to be ineffective.

We wanted to minimize the amount of effort that the participant would have to exert in order to receive a piece of the banana and the 5-minute break. We stood in proximity to the participant and presented the same instruction. This was effective, as the participant complied with the instruction without instances of the verbal and physical aggression. If she complied and did not engage in physical or verbal aggression for three consecutive trials, we increased the distance by approximately 75%. For example, we stood 1 inch, 2 inches, 4 inches, and 7 inches away from the participant after she complied for three consecutive trials. Once we stood 7 inches away, compliance occurred less often. We hypothesized that the increase from 4 inches to 7 inches was too large. We wanted to determine whether we would see compliance if we went back to standing 4 inches away from the participant. When we went back to 4 inches, the participant did not comply. Unfortunately, the study finished before we were able to further investigate why we no longer saw compliance and before we were able to effectively get her going to the bathroom following the instruction. Throughout the study, however, we did not see instances of physical or verbal aggression during our sessions, even though the requests we used had been requests that had resulted in physical or verbal aggression for staff.



*Figure 7.* The graph displays cumulative number of times the participant complied with the instruction and engaged in physical or verbal aggression. The cumulative number was calculated by adding the frequency of compliance or physical/verbal aggression in a trial to the previous trial. When the data path is a straight line, then participant did not engage in the target behaviors. If the data path increases, then the participant did engage in the target behaviors. Compliance is reflected by the black circles, and physical and verbal aggression reflected by the white triangles.

Participant 18 was also referred for taking food, drinks, and items (e.g., napkins) from other residents, the nurse's cart, and the food cart. During mealtimes, we observed how often the participant engaged in the behavior. During the first six sessions, the behavior did not occur. See Figure 8 for a visual representation. The participant ate her meal in her room, and during the first six sessions, she did not leave her room or she fell asleep; there was no opportunity for her take food, drinks, or items from others or the food cart. Between sessions 7 and 13, we did see instances of the behavior because the participant left her room, suggesting that if the participant leaves the room, the behavior is likely to occur.

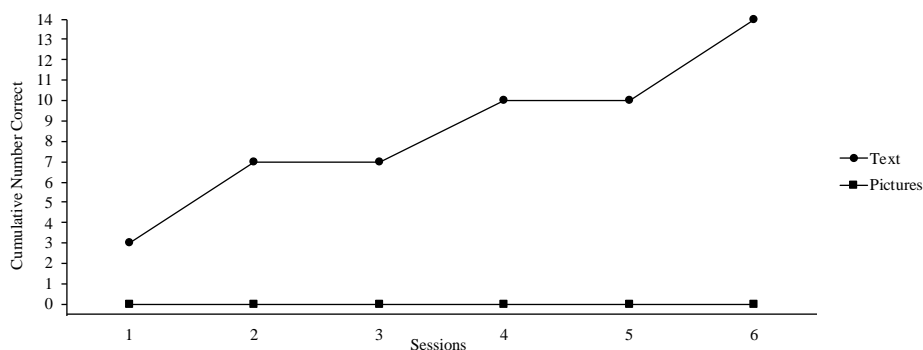


*Figure 8.* The graph displays the number of times the participant took food, drinks, or items from other residents, the nurse's cart, or the food cart per session.

We also we observed what happened after each instance of the behavior. Typically, the

participant would receive attention from staff or access to preferred foods (e.g., desserts, sugar packets) and drinks (e.g., hot chocolate). We hypothesized that the participant would leave her room to contact that attention or to receive those preferred foods and drinks. Therefore, we conducted an assessment to determine why the behavior was occurring. If the participant left her room, we provided 1) a tray with the foods and drinks that she typically took, 2) attention (e.g., asking how she is doing, making comments about her meal), or 3) the tray and attention. We also included a control condition, in which we provided continuous attention and access to her preferred foods and drinks in her bedroom. We recorded how long it took for the participant leaving her room (referred to as latency). The condition with the lower latency was determined to be the reason for why the behavior occurs. Unfortunately, we were unable to complete this assessment, as the participant stopped leaving her room, and staff reported that this behavior was no longer an issue. We continued to monitor for instances of the behavior and checked in with staff to see if the behavior became a concern again.

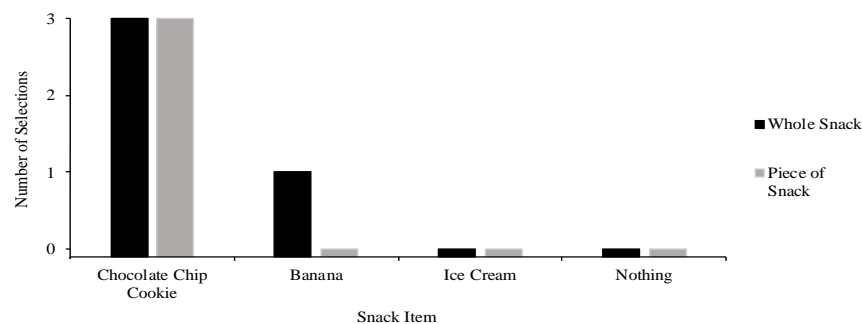
**Skills acquisition.** In addition to reducing instances of BPSD, we also identified skills that we could teach, as well as identified appropriate behaviors that we could increase. Participant 11 was deaf; staff reported he could no longer emit vocal responses and had no effective form of communication. However, one day while walking with him we observed him speaking and therefore sought to increase his communication skills. Prior to starting communication training, we conducted an assessment to determine whether the participant could read or if he could label a picture (as the instance during which we observed him speaking there was a picture and text that matched what he had said). We presented the written word and pictures of items that were frequently in his environment (e.g., chair, shoe) and items that staff would like him to request (e.g., banana, milk). Results of the assessment revealed that he was more likely to read the text aloud than to correctly label the picture. See Figure 9 for a visual representation.



*Figure 9.* The graph displays the cumulative number of times the participant correctly read the text or labeled the picture aloud. The cumulative number was calculated by adding the number correct for one session to the number correct of the previous session. When the data path is a straight line, then the participant did not make a correct a response. If the data path increases, then the participant did engage in the correct response. Each instance of reading the text are displayed as a circle, and each instance of labeling the picture are displayed as a square.

We conducted a second assessment to determine his preferences for snack items. During the assessment, we presented the following items: a banana, chocolate chip cookie, and ice

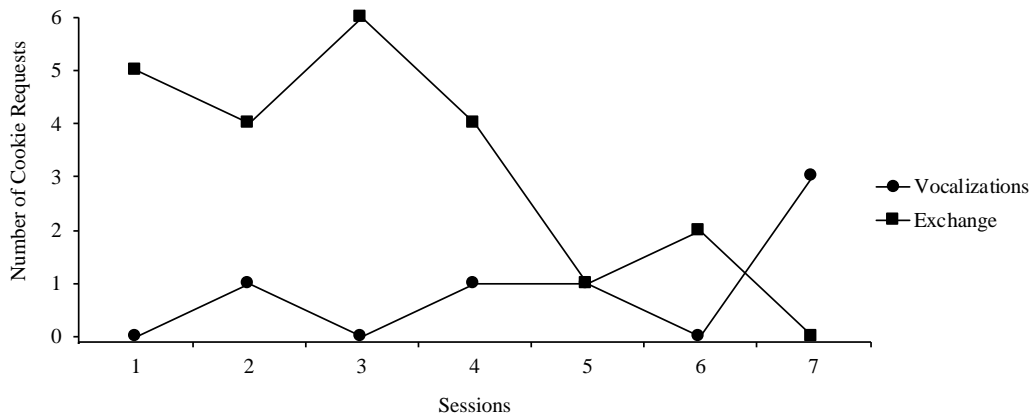
cream. We also included the written word with each item. To demonstrate that he was selecting his preferred snack rather than arbitrarily selecting from snacks, we included an option to select nothing. After he made a selection, we rearranged the position of the food items, re-presented all the items, and asked him to make another selection. Results indicated that he selected the cookie more often, suggesting the chocolate chip cookie was a more preferred snack item in comparison to the other options. See Figure 10 for a visual representation. Following this assessment, we wanted to identify whether results could be replicated when he was presented with a piece of each snack item (i.e., slice of banana, spoon of ice cream, a fourth of a cookie) rather than the full snack item (i.e., whole cookie, whole banana, cup of ice cream). Results indicated that chocolate chip cookies were still more preferred. See Figure 10 for a visual representation.



*Figure 10.* The graph displays number of times the participant selected each snack item. The full snack item (e.g., whole cookie) is displayed in the black bars and the half snack (e.g., a fourth of a cookie) is displayed in the grey bars.

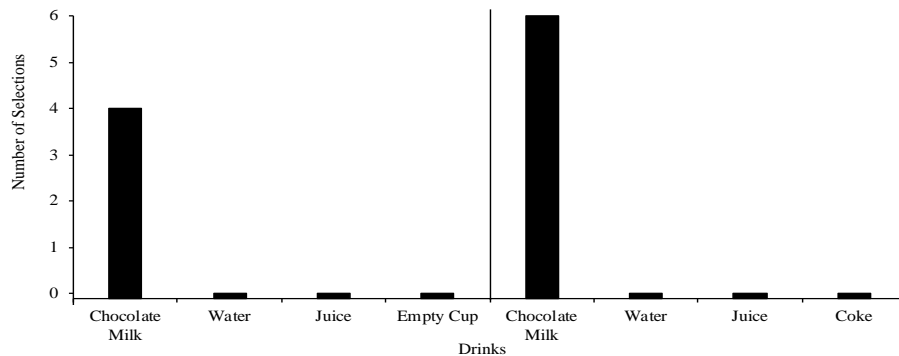
Following the assessment, we wanted to teach the participant how to exchange a written word for the physical item. This would give him an alternative form of communication to express his needs and wants. During our observations of the participant, we saw that he frequently would point and emit random vocalizations (e.g., Shirley Temple, Tennessee). Staff were used to the participant engaging in these behaviors and did not attend to what he was saying. As we developed his communication training, we needed him to engage in a response that would be more salient for staff to respond to.

Based on the results of the assessment, we began communication training for the word cookie. The purpose of the communication training was to teach the participant. Specifically, we wanted to teach him how to exchange the word “cookie” for a piece of a chocolate chip cookie. The written word, “cookie,” was printed on paper and laminated. We will refer to this as a card. A researcher placed the card in front of the participant, and a chocolate chip cookie was within the participant’s sight. The researcher held out her hand and waited for him to place the card in her hand. If he did not place the card in her hand after 5 seconds, then she gave him the card and held her hand out again. If he gave her the card, he received a piece of the cookie. The results indicated that he made several exchanges across sessions and would also say, “cookie.” These data suggested that we started to teach the participant an effective way to communicate when he wanted a cookie, and he was emitting more vocal responses. See Figure 11 for a visual representation.



*Figure 11.* This graph depicts the number of times the participant made a request for a chocolate chip cookie by exchanging the card. The number of exchanges are displayed by squares, and the number of vocalizations (i.e., “cookie”) are displayed by circles.

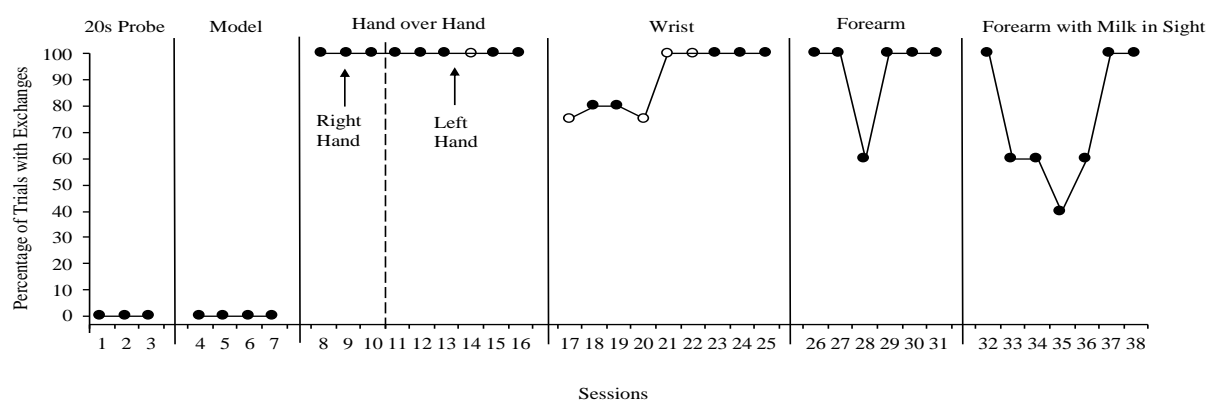
By session 6, the facility no longer had chocolate chip cookies. We brought in chocolate chip cookies for session 7, but we knew this would not be sustainable. We conducted an additional assessment to identify his preferences for drinks. We presented a cup of water, juice, chocolate milk, and an empty cup (to ensure that he was not arbitrarily selecting drinks), along with the written word. The procedures were similar to the assessment identifying preferred snack items. The results indicated that he preferred chocolate milk. After a few sessions, staff also reported that he liked Coke. We wanted to identify whether results could be replicated when Coke became an option and when we removed the empty cup. Similar to the first assessment, chocolate milk was his preferred drink. See Figure 12 for a visual representation of both assessments.



*Figure 12.* The graph displays the number of times the participant selected each drink. The left side of the graph displays the results for when coke was not included in the assessment, and the right side of the graph displays results for when coke was presented.

Based on the results of the assessment, we started to teach with the word, “milk.” (we chose milk because when presented with the word, “chocolate milk” he did not correctly read this word aloud, but he did correctly read “milk” aloud). Also, staff did not give him milk unless

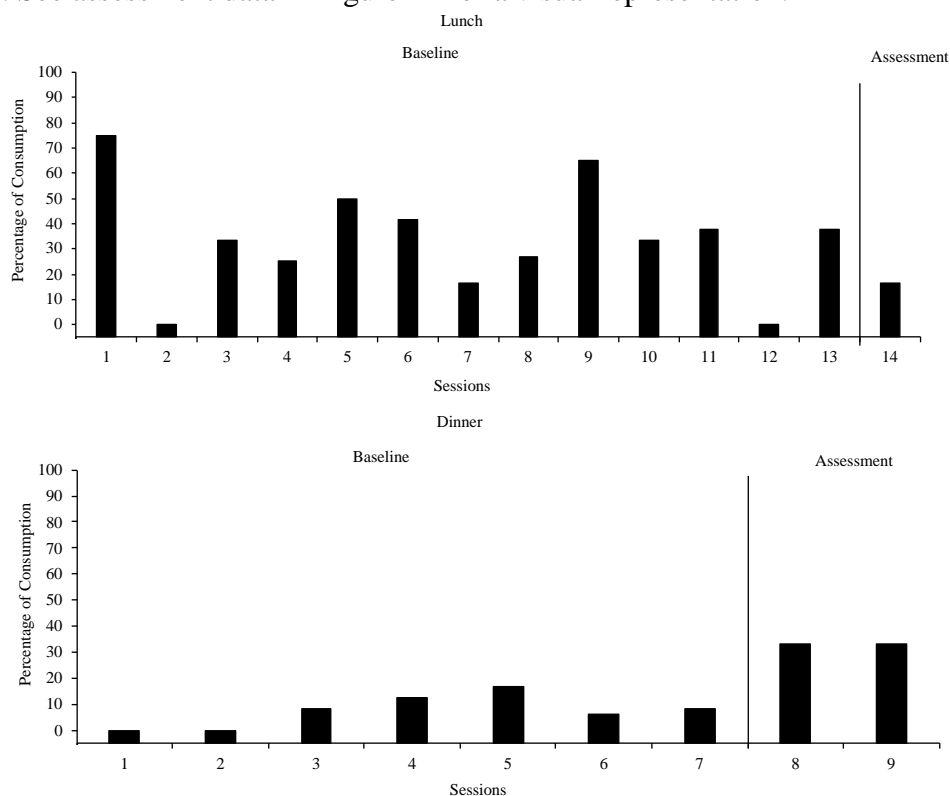
it was chocolate milk. We modified our procedures based on our observations from teaching the exchange for a cookie. During the first four phases of the communication training, a cup of chocolate milk was not within the participant's sight because the participant would reach for the cup. In the first phase, the written word, "milk," was presented on a card, and we recorded if the participant would make an exchange within 20 seconds (i.e., 20-second probe). In the second phase, a researcher demonstrated (i.e., model) how to make the exchange (to see if he would simply copy the researcher, thus drastically shortening the teaching phase). During both phases, the participant did not exchange the card for chocolate milk. See Figure 13 for a visual representation. In the following phase, we provided assistance. We first began with a hand over hand approach. One researcher stood next to the participant, placed her hand over the participant's hand, guided his hand to the card, and gave the card to a second researcher. After each exchange, we gave the participant some chocolate milk. We used the hand over hand approach on the participant's right hand, but observed the participant reaching towards the card with his left hand, suggesting that his left hand may be his dominant hand. Thus, we provided assistance with his left hand for the duration of the study. Once the participant had 100% exchanges for three sessions and across two days, we gradually reduced the amount of assistance we provided by guiding his arm at the wrist and then forearm. Once assistance was provided only at his forearm and the participant started to learn the new communicative response, a cup of chocolate milk was once again placed within the participant's sight. As we reduced our assistance, the participant began to make independent (i.e., required no assistance from us) exchanges. With this training, we started to teach the participant an effective way to communicate when he wanted chocolate milk. We had plans to further teach this response, teach other responses, teach him to use this form of communication with staff, and train staff on this form of communication, but we were unable to because the participant moved out of the facility.



*Figure 13.* The graph displays the percentage of trials in which the participant made the exchange. A session consisted of 5 trials. We recorded the number of exchanges (with and without assistance) the participant made, divided it by 5, and multiplied by 100. The white circles indicate days in which we were unable to present 5 trials (e.g., participant no longer provided assent).

For participant 18, the director of nursing reported that one of her goals was to increase her nutritional intake, as she had a history of being put on hospice due to significant weight loss. Staff reported that the participant consumed food and drinks that were high in sugar (e.g., sugar packets, cookies, chocolate, chocolate milk, hot chocolate) and low in nutritional value. We

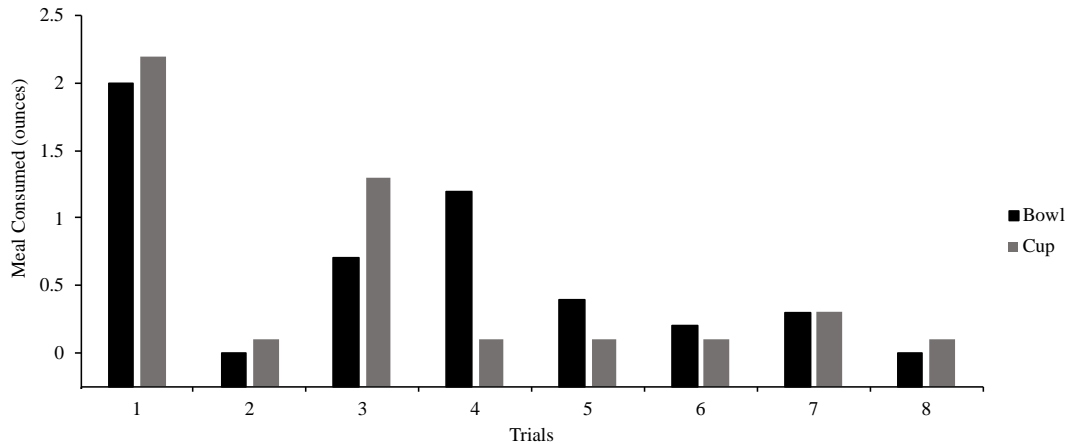
conducted several observations to identify the participant's eating patterns, and we estimated how much she consumed foods (i.e., 25%, 50%, 75%, and 100%) that had nutritional value as identified by the director of nursing (e.g., vegetables, meat). Baseline data indicated that the participant consistently ate foods that were presented in approximately 3-ounce transparent cups. See baseline data in Figure 14 for a visual representation. Following baseline, we presented half of the participant's meal on a plate and half in the 3-ounce cups. Results of the assessment demonstrated that the participant consumed more of her meal when it was presented in the 3-ounce cups. See assessment data in Figure 14 for a visual representation.



*Figure 14.* The graphs display the percentage of meal consumption at lunch and dinner during baseline and assessment.

After staff observed us conduct the assessment, they began to serve the participant's meal in approximately 12-ounce brown bowls. Given that the bowls had a different appearance than the cups, we conducted a second assessment to determine whether those differences impacted food consumption. We divided her meal into bowls and cups. We weighed each bowl and cup before the participant ate. Then, we presented the bowls and cups. After 10 minutes, we weighed the bowls and cups, re-arranged the food items, and presented the bowls and cups. Each 10-minute block reflected one trial. At the end of the meal, we weighed the bowls and cups and calculated how much she ate. Results from the assessment indicated that the appearance did not make a difference, as she consumed a similar amount from the cups and bowls. See Figure 15 for a visual representation. Since this assessment, staff continued to present her food in bowls and reported a significant, healthy weight gain.





*Figure 15.* The graph displays the amount of food participant 18 ate in the bowls and in cups. The amount of food eaten in the bowls and cups are displayed as black and grey, respectively.

***We saw instances of the behavior, but did not make it to assessment.*** For participant 17, we were unable to see the behaviors occur consistently, and there were several medication changes. The participant experienced sedative effects due to the medications, and we were unable to work with the participant.

Participant 3 had dysphagia and consuming food outside of his diet put him at risk for choking. During our observations, we observed the participant taking other residents' foods and drinks after most residents and staff members left the dining room. Shortly after conducting our observations in the dining room with 30-40 residents, the participant was moved to a smaller dining room with approximately 5 residents. In the smaller dining room, a staff member was always present and most of the other residents had the same diet. We did not see instances of the behavior.

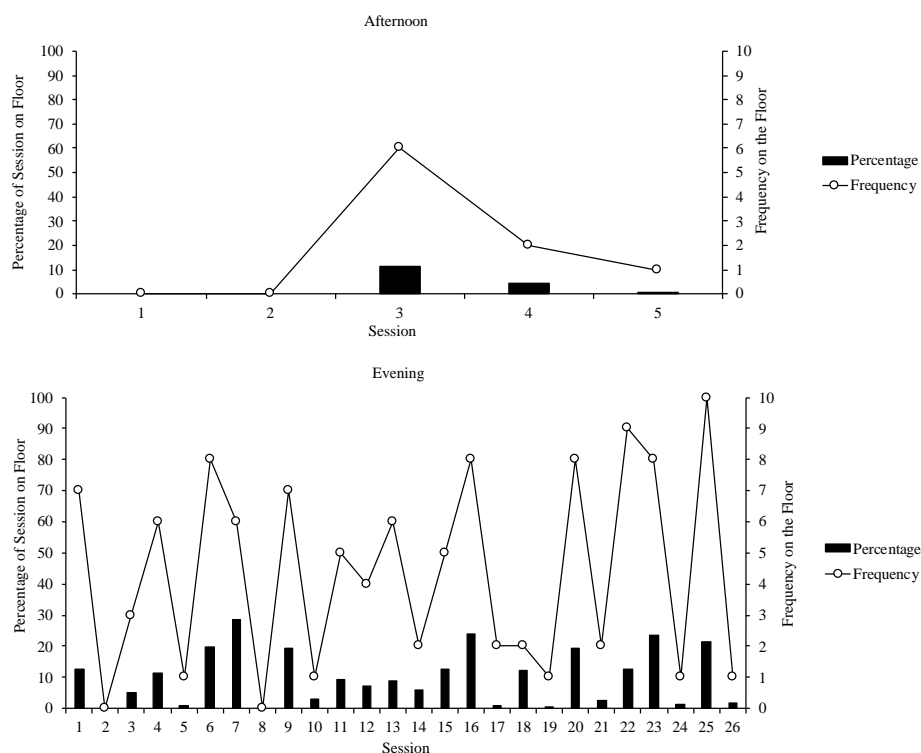
For participant 2, she engaged in physical and verbal aggression during her shower routine. We observed staff provide the care twice, and we saw instances of the behaviors during both observations. Following our second observation, hospice took over the responsibility for completing her shower routine. We made attempts to collaborate with hospice and to schedule times to observe the showers; however, we were unsuccessful. Neither the hospice manager nor staff at the facility could identify when hospice care workers would be present to provide the care.

We saw participant 14 engage repeatedly asking for his wife and making statements about going home, but the behaviors did not occur often. We conducted 17 observations during the times staff reported the behavior occurred. Of the 17 observations, we saw the behavior occur during two observations. He was also referred for refusing cares and yelling, but we did not see instances of these behaviors. When behaviors occurred, it often co-occurred with an underlying medical condition, such as a urinary tract infection (UTI). Once the UTI was treated, we no longer saw instances of the behavior. Staff also reported that the behaviors decreased.

We saw participant 7 engage in delusional speech, but delusional speech did not occur often, and we did not see instances of his other reasons for referral. We conducted 29 observations. Of the 29 observations, we observed delusional speech twice. During the remainder of the observations, the participant was either sleeping or watching television in his room.

***We saw instances of behavior, made it to assessment, and provided recommendations.*** As described above (see summary of process), we interviewed staff who frequently worked with participant 12 to gather information about behaviors; they reported no behaviors of concern. The case manager, however, expressed concerns regarding the participant sitting on the floor and disrobing. After discussing the participant's reason for referral with the case manager, we re-approached staff to gather more information about these behaviors. Staff reported that the participant did engage in those behaviors, but the behaviors were not disruptive and that was why did they did not report the behaviors initially. Staff also reported that the behaviors occur throughout the day.

During baseline, we conducted 1-hour observations and recorded how often the participant sat on the floor across different times of the day. Baseline data demonstrated that the participant was more likely to sit on the floor in the evening (i.e., after 5pm) than in the afternoon (i.e., 1-5pm). See Figure 16 for a visual representation of the participant sitting on the floor.

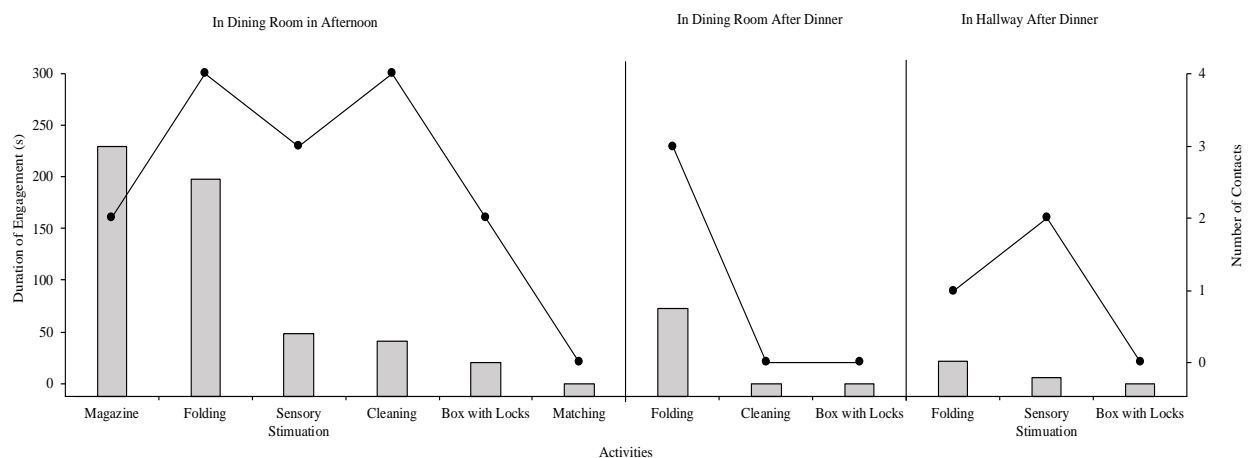


**Figure 16.** The graph depicts the percentage of time the participant sat on the floor during a 1-hour observation on the y-axis and is presented as the bars. The percentage of time was calculated by the number of seconds she spent on the floor divided by total time of the observation (i.e., 3600 seconds) multiplied by 100. The graph also depicts number of

times the participant was on the floor and is presented as the line. The top graph displays data for the afternoon sessions and the bottom graph displays data for the evening sessions.

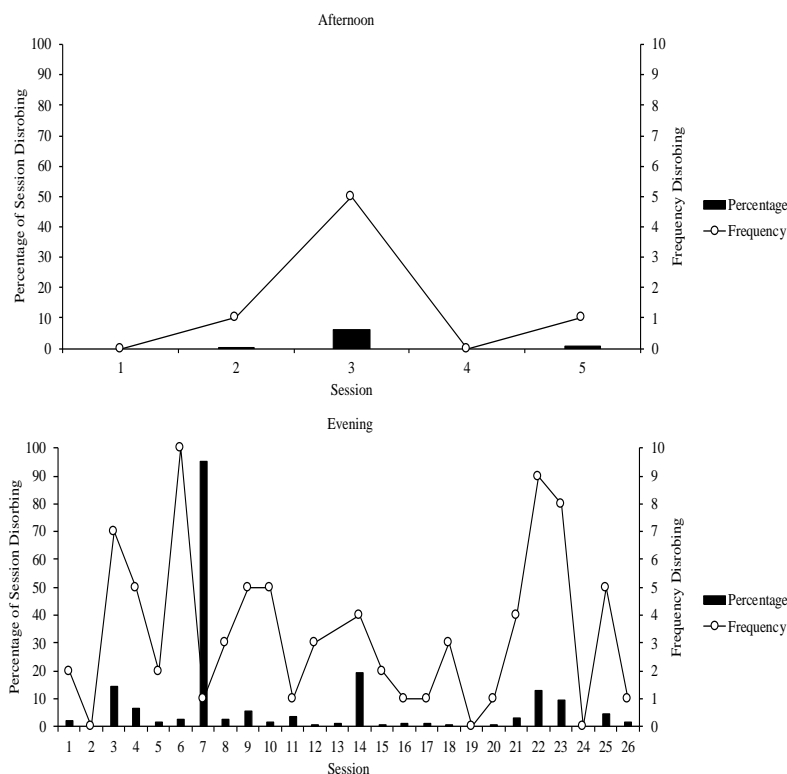
We also conducted three preference assessments to determine the participant's preferred activities. For this assessment, we presented the following activities: 1) a sensory stimulation item, 2) a lock box, 3) clothes, blankets, and towels to fold, 4) a magazine, 5) a towel to clean bingo cards, and 6) a set of cards that can be matched based on colors and shapes. Each activity was presented one at a time on the table, and the researchers recorded how many times the participant touched the item and how long she engaged (i.e., manipulated the item as intended) with the item during a 5-minute session. The first preference assessment was conducted in the dining room in the afternoon. Results indicated that her top preferred activity was a magazine, as she engaged with this item the most often. See Figure 17 for a visual representation of results. During the preference assessment, the participant did not get on the floor (i.e., it appeared that not only was magazine preferred, but the presentation of activities interfered with getting on the floor).

Given that the participant was more like to sit on the floor in the evening, we replicated this assessment in the dining room and in the hallway of the facility (the participant enjoyed spending time in this area) in the evening. In the subsequent preference assessments, not every item could be presented because they were no longer accessible in the facility. During these two preference assessments, results of the previous preference assessment were not replicated, though she did not get on the floor. See Figure 17 for a visual representation of results. We hoped that the results of these assessments would help us identify activities that would be more preferred than sitting on the floor. Based on the results, we suspect that she would not engage with the items, if they were presented to her while she was on the floor.



*Figure 17.* The graph depicts the results from the three preference assessments. The left y-axis includes the duration of engagement with each item and is displayed as a bar on the graph. The graph also displays the number of times the participant made a physical contact with each item on the right y-axis and is displayed as a line on the graph.

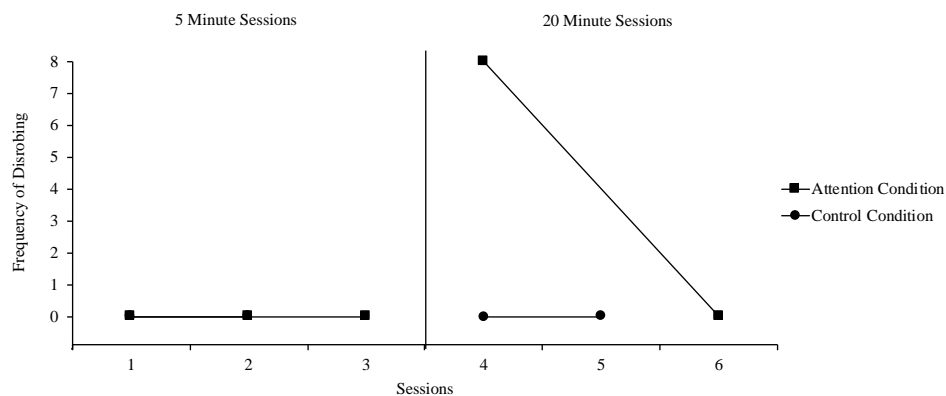
We also conducted 1-hour observations and recorded how often the participant disrobed across different times of the day. Baseline data demonstrated that the participant was more likely to disrobe in the evening (i.e., after 5pm) than in the afternoon (i.e., 1-5pm). See Figure 18 for a visual representation of the participant disrobing.



*Figure 18.* The graph depicts the percentage of time the participant disrobed during a 1-hour observation on the y-axis and is presented as the bars. The percentage of time was calculated by the number of seconds she disrobed divided by total time of the observation (i.e., 3600 seconds) multiplied by 100. The graph also depicts number of times the participant disrobed and is presented as the line. The top graph displays data for the afternoon sessions and the bottom graph displays data for the evening sessions.

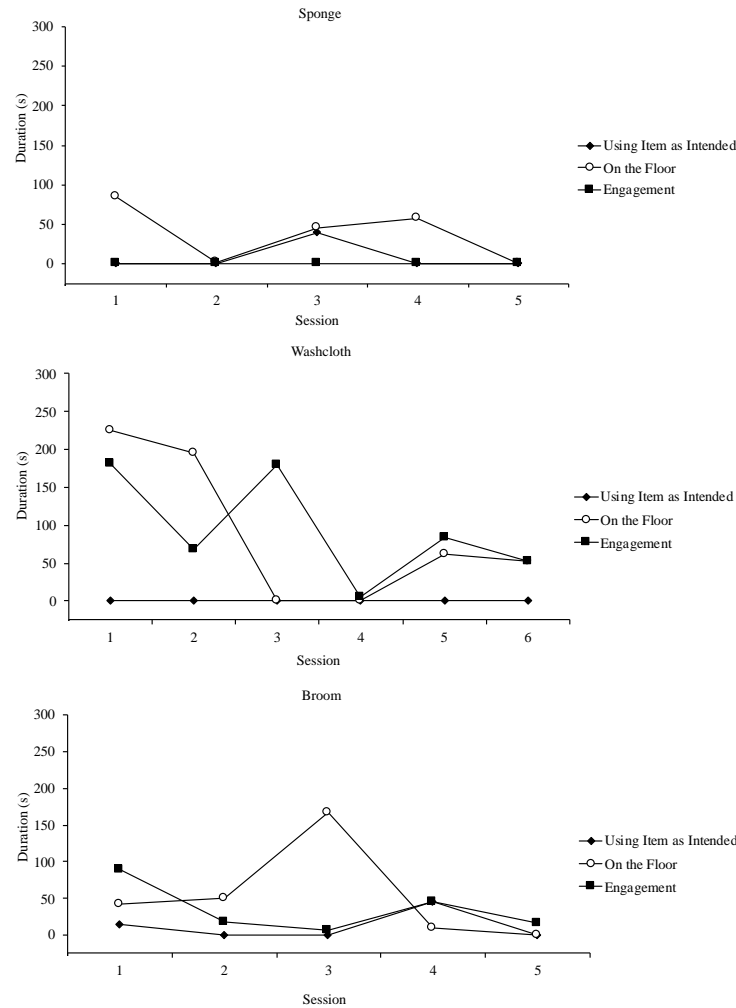
When the participant disrobed, staff provided high quality attention (e.g., physical contact, walking next to her), took her to the bathroom, and offered her a change of clothes. To identify which consequence (i.e., bathroom, attention, or change of clothes) was the reason for why the behavior was occurring, we attempted to conduct an assessment. This assessment was important, as we may have identified if staff were providing things that were unnecessary and a subsequent intervention might have meant less work for staff. For instance, if the behavior occurred more often when attention was provided, then staff may not have to take her to the bathroom or provide a change of clothes after she disrobes. Meanwhile, if she engaged in the behavior more when she was taken to the bathroom than the other conditions, then staff may not have to offer a change of clothes. We, however, were unable to complete this assessment because staff began to regularly change the participant for bed prior to dinner, and staff reported that they were less likely to offer a change clothes after dinner. Additionally, staff were unavailable to take her to the bathroom immediately after each instance of the behavior.

Although the staff changes described above meant that we did not need to evaluate the impact of taking 12 to the bathroom or providing a change of clothes, we modified our assessment to identify whether the attention variable had an impact on disrobing. The conditions consisted of a test condition in which we provided attention after each instance of disrobing and a control condition, in which we provided continuous attention (i.e., every two and a half minutes), regardless of the behavior. Sessions 1 and 2 were 5-minutes long, and the behavior did not occur in either condition. See Figure 19 for a visual representation. We reviewed our 1-hour observations and saw that the behavior did not typically occur within the first 5-minutes of those observations. Thus, we calculated the average time from the start of the session to the first occurrence of the behavior (i.e., latency). On average, the behavior did not occur until the 17<sup>th</sup> minute of the session. Therefore, we increased our sessions to 20 minutes to increase the chances that we would capture the behavior, if the behavior were to occur. During the 20-minute sessions, we saw instances of disrobing in one attention condition. We, however, do not have enough data to make conclusions about whether the participant was disrobing to contact attention from staff. Unfortunately, we were unable to run additional sessions due to the study ending.



*Figure 19.* The graph displays the number of times the participant disrobed during the attention and control conditions. The attention condition is displayed by the squares, and the control condition is displayed by the circles.

Additionally, staff and case management frequently reported that they thought the participant might be sitting on the floor to clean (i.e., they thought it looked like she was cleaning the floor when she was on the ground). To determine whether this was a part of the target behavior, we conducted an assessment to identify if she might use a cleaning item when available. The following cleaning items were presented: 1) broom, 2) sponge, and 3) dry washcloth. We gave the participant one item at a time and recorded how long she: 1) engaged with the item as intended (e.g., wiped down a table with a washcloth), 2) used the item not as intended (e.g., folding a washcloth), and 3) sat on the floor during 5-minute sessions. Results indicated that she did not use the items as intended, suggesting that it was unlikely that she was getting on the floor as a way to clean. See Figure 20 for a visual representation of the results.



*Figure 20.* The graphs depict the total number of seconds the participant used the sponge (top graph), washcloth (middle graph), and broom (bottom graph) as intended, engaged with the items in ways not intended, and getting on the floor during 5-minute sessions. The diamond data points represent how long she used the items as intended, the circle data points represent how long she was on the floor, and the square data points represent how long she engaged with the items.

Although we conducted multiple assessments, we did not obtain results that informed treatment for either behavior. If we did obtain results that informed treatment, we suspected that it would be unlikely that staff would use the intervention, as they did not report these behaviors to be of concern. That is, any intervention that requires extra work on the part of staff is likely to be unsuccessful if staff do not see the behavior as problematic. Still, we provided general recommendations. We recommended that staff take the participant to the bathroom on a routine schedule. For example, staff should take her to the bathroom soon after she woke up, after every meal, and before she went to bed (i.e., approximately every 2 and a half hours). We also recommended that staff provide high quality attention (e.g., one on one interactions, walking with her, offer preferred items) during times that the participant was not disrobing. Additionally, providing opportunities for high quality attention and activities that could be conducted at a table

or while walking could have helped reduce spending time on the floor.

***We saw instances of the behavior, did not complete assessment, but provided recommendations.*** Participant 15 was referred for engaging in non-reality speech, exit seeking, property destruction, pinching staff, yelling, and crying. Upon initial referral, we were unable to see instances of the behavior. To help narrow down the times when the behavior occurred, we created a data sheet. We broke down the day into 4-hour blocks of time, and asked staff to circle “yes” if the behavior occurred and “no” if the behavior did not occur. Based on data gathered, we identified times to observe the participant. During our observations, we identified variables that could be maintaining the behavior (e.g., one-on-one interactions from staff), but we did not identify the variables that triggered the behavior. Thus, we conducted an assessment to determine whether we could turn the behavior on. During the conditions, we either had a researcher or a staff member sit next to the participant, and when the participant initiated an interaction, the researcher or staff member would respond. Results from this assessment indicated that physical presence alone did not turn the behavior on. As we continued our observations, we identified that the behavior did not occur consistently, but rather in waves and were disruptive and challenging for staff. When the behaviors occurred, we used different strategies and determined whether that strategy reduced the frequency of the target behaviors, as well as prevented those behaviors from escalating. Once the strategies were identified, we provided administration with a staff training that was made available on Relias, a continuing education portal. See the *Proposed Outcomes D and E: Demonstrate Staff Knowledge, Skills Acquisition, and Develop Training Materials* section below.

As we trialed different strategies with 15, she was admitted to the psychiatric unit due to an increase in behaviors. She had a history of UTIs, and prior to admission to the psychiatric unit, we asked nursing if she could be tested for a UTI. Nursing staff informed us that residents must meet the criteria for a UTI test as outlined by Centers for Disease Control and Prevention (2019). Unfortunately, a sudden increase in behaviors is not listed as a criterion, even though we commonly see the onset of a UTI impacting behavior. While she was at the psychiatric unit, she was given a new psychosis diagnosis of bipolar disorder, as well as medications prescribed for bipolar disorder. After she returned to the facility, behaviors were still occurring at an increased frequency. Because she was already sent to the psychiatric unit, nursing staff tested her for a UTI, and the results came back positive. Once the UTI was treated, behaviors ceased. There was no re-evaluation to whether the bipolar diagnosis and medication was still appropriate. If a sudden increase in behaviors is listed as a criterion, we may have prevented sending her to the psychiatric unit, started her on the proper course of treatment sooner, and she may not have the new diagnosis and medication.

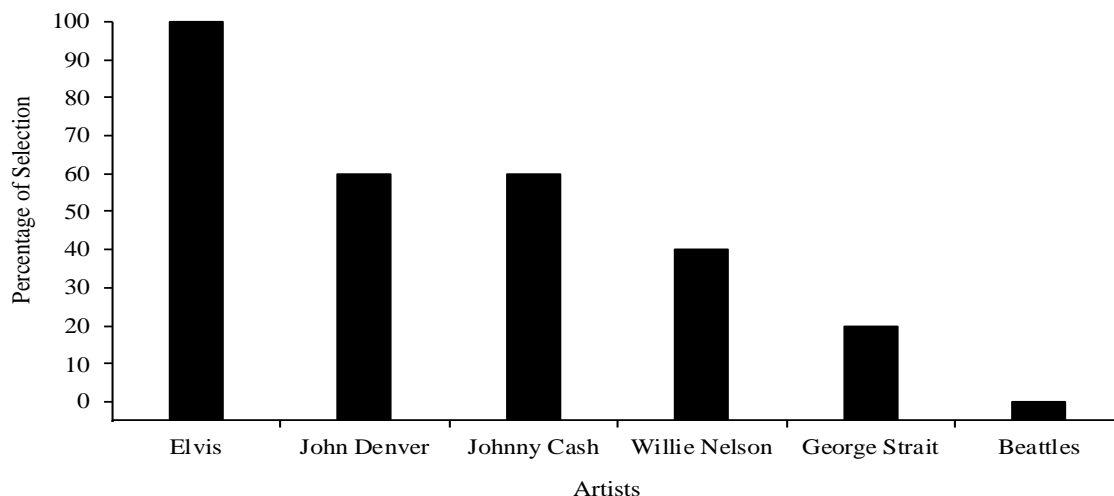
Participant 13 had a history of leaving the facility (i.e., elopement). When she was outside the facility, staff reported it was difficult to redirect her back into the facility. Staff further reported that the behavior was more likely to occur during the summer months. We received the referral to work with her during the winter, so we monitored her through the summer. We observed the participant 190 times, but the participant never engaged in the behavior. We started to investigate changes from the previous summer to the current summer. In the summer following her referral, staff stopped taking the participant outside, so there was no opportunity for her to engage in the behavior. Additionally, the facility happened to have remodeled and

created an activity room that had windows facing the main road. Once the room was created, the participant spent much of her time looking out the window, and we continued to not see any instances of elopement. It appeared that her desire to leave the facility was to be able to watch people and traffic on the road, so this new room allowed her to do that. While we monitored the participant, she began to engage in other behaviors, such as frequently asking for staff while waiting for her meal and approaching other residents' family members. After observing these behaviors, we recommended that the participant be brought into the dining room after her tablemates were seated (prior to this, she was brought to the dining room early and the behaviors occurred while her tablemates were being brought in). The participant was likely to engage in conversation with her tablemates and we felt this could help decrease the number of times the participant was calling for staff. We also recommended that staff approach the participant before the participant was in proximity to other residents' male family members.

Participant 10 was referred for screaming frequently. He was fed via a tube and had a schedule for his meals. Staff reported the behavior occurred prior to his scheduled meals, during his meal, and after his meals. During the observations, we saw that staff would reliably provide attention soon after each occurrence of the behavior. We also saw that if he received approximately 5 minutes of continuous attention prior his meal and approximately 4 minutes of attention after his meal, we did not see instances of the behavior.

The participant also began working with occupational and physical therapy to strengthen his core so that he could start to wheel himself in a wheelchair. Once he started therapy, staff reported that he was no longer screaming, and we no longer saw instances of screaming around meal time. The manager of therapy reported that he was stronger in his legs, but was not using his legs to move in the wheelchair; he was using his arms, but would become tired and frustrated. In collaboration with occupational and physical therapy, we wanted to help increase his foot use. To do so, we identified stimuli the participant might want to work for. Staff reported that he liked music, so we began by conducting an assessment to identify his preferences for music. We included songs by the following artists: Johnny Cash, Elvis, John Denver, The Beatles, George Strait, and Willie Nelson. We asked him if he would like to listen to one artist or another (e.g., "would you like to listen to Johnny Cash or Elvis?"). After he selected an artist, we played part of a song by that artist. Results of this assessment indicated Elvis is his top preferred artist. See Figure 21 for a visual representation.





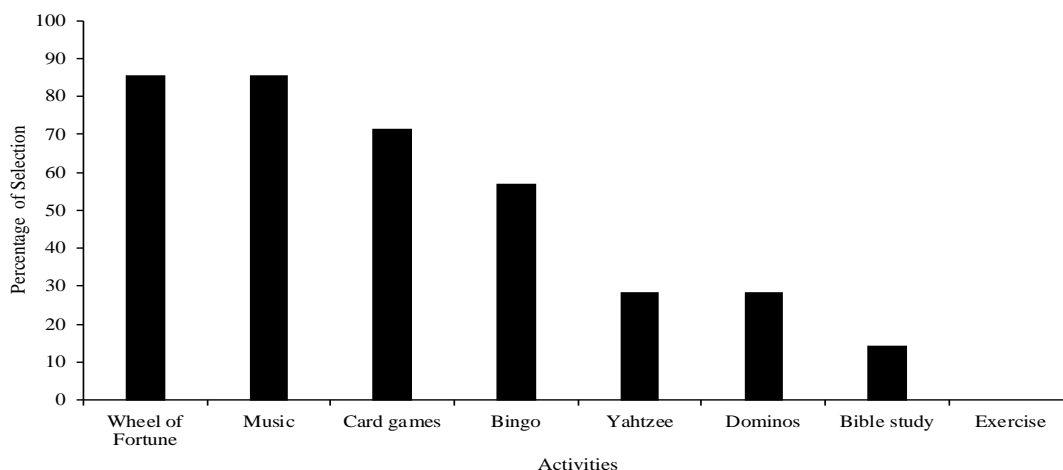
*Figure 21.* The graph depicts the percentage of selection for each artist. The percentage was calculated dividing the number of times each artist was presented by the number of times the artist was selected multiplied by 100.

Results of the preference assessment would have been used in a subsequent assessment, which would include a tablet with two buttons on the screen. The tablet would be connected to two foot pedals. If he used his foot to press the foot pedal on the left, then he would hear one of his top preferred artists. If he used his foot to press the foot pedal on the right, then he would hear a different artist. If we saw more foot pedal presses on one side, then this would suggest that he was willing to work to listen to the song associated with that foot pedal. Our plan was that during therapy, we would play the song after each instance he used his foot to move in his wheelchair. Over time, we would expect to see an increase in him using his feet. Unfortunately, this procedure could not be implemented. Occupational and physical therapy reported that the participant was not making gains (in spite of the fact that we were working with him to identify ways to help him make gains), and they could no longer provide services.

Once he was discharged from therapy, he was moved to the long-term care unit, and there was an increase in his screaming. We suspected this was due to changes in his environment. He was no longer working with occupational and physical therapy, both of which included long spans of quality attention. There were also more residents on the unit, so there were fewer opportunities for him to interact with staff and receive one-on-one, high quality attention. In efforts to address his screaming, we asked staff if they would like us to conduct assessments to identify a schedule of attention (e.g., every 15 minutes) that would result in fewer instances of screaming. Staff reported that they were not interested in this suggestion.

Staff in long-term care reported that he would benefit from participating in activities, but they did not know what activities he enjoyed. We reviewed the facility's scheduled activities and identified activities that the participant could engage in. We did not include activities that would be inappropriate for the participant. For instance, he was fed via a tube, so we did not include activities that offered snacks. We took the remaining activities and conducted a preference assessment. We presented the following items: Wheel of Fortune, music, card games, bingo, Yahtzee, dominos, bible study, and exercise. Each item was paired with each other, and we asked

the participant, “do you enjoy [insert name of activity] or [insert name of activity]?” Results indicated that his top preferred activities were Wheel of Fortune, music, and card games. See Figure 22 for a visual representation of results. After the assessment, we wanted to invite the participant to participate in his preferred, scheduled activity. However, in the following months, different activities were offered, and his top three preferred activities were not available. We invited him to play bingo (his fourth preferred item) with us, but he refused.

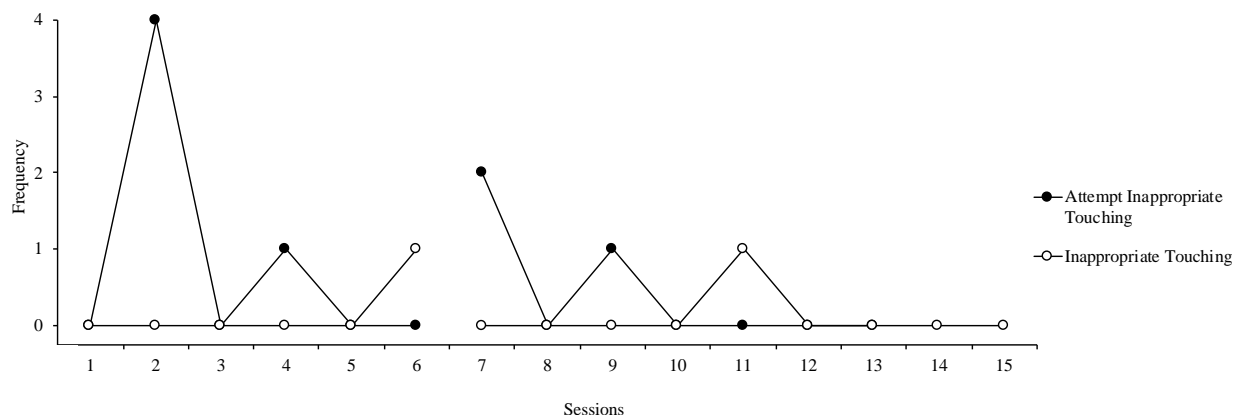


*Figure 22.* The graph depicts the percentage of selection for each activity. The percentage was calculated dividing the number of times each item was presented by the number of times the item was selected multiplied by 100.

Although we were unable to implement an intervention to address his behaviors, we provided staff with some recommendations. We recommended that staff provide one-on-one, high quality attention for approximately 5 minutes throughout the day. We also recommended that staff encourage activity engagement by inviting him to his top preferred activities (if offered, or encourage the activities department to have these activities available) and to set the participant up with preferred music in his room.

Participant 1 was referred for inappropriately touching staff during care routines. During baseline, we recorded when he made an attempt to inappropriately touch staff (i.e., no physical contact was made, but he reached toward staff) and when he inappropriately touched staff (i.e., physical contact was made). Results from the observations suggested that the participant made more attempts to inappropriately touch staff, as the staff member stepped away or moved the participant’s hand(s) before he made physical contact. See Figure 23 for a visual representation of the data. Between sessions 6 and 7, there was a 3-month gap due to new staff feeling uncomfortable being observed (i.e., when we approached staff to ask if we could observe the care, as we had before, they now refused to allow us to watch). During this time, a bar was installed on the participant’s bed. Following the 3-month gap, we observed that staff frequently asked the participant to hold on to the bar and reported fewer instances of the behavior. Due to difficulties observing staff and the low frequency of behavior, we recommended that staff describe each step of the care, orient the participant to the bar on his bed during the care, and to ask him to complete components of the care independently (e.g., asking him to wash his face

with a washcloth).



*Figure 23.* The graph displays the number of times the participant attempted to inappropriately touch and inappropriately touched staff. Attempts are represented by the black circles. Instances of inappropriately touching staff are represented by the white circles.

In summary, we saw behaviors for 8 participants. For one participant, we demonstrated an effective recommendation and trained staff on the implementation of that intervention. For one participant, we conducted an assessment that produced a decrease in the behavior, but were unable to move into intervention because the participant passed away. For the remaining 6 participants, we saw instances of the behavior and provided staff with some recommendations. See Table 3 for a summary of recommendations.

Table 3  
*Summary of Recommendations*

Participant	Recommendation
1	Staff describe each step of the care, orient him to the bar so he can hold onto it, and ask him to complete parts of the care independently.
10	Staff invite him to his top preferred activities when they are offered by the activities department, set him up with preferred activities in his room, and provide one-on-one high quality attention for 5 minutes throughout the day.
12	Staff take her to the bathroom on a routine schedule (approximately 2.5 hours) and to provide high quality attention or offer preferred activities when she is not disrobing or on the floor.
13	Staff bring her to the dining room table after her tablemates were seated and to approach her prior to her being in proximity to other residents' male family members.

Table 3  
*Summary of Recommendations (cont.)*

Participant	Recommendation
15	Staff approach her when she is not engaging in an undesirable behavior and provide high quality attention by sitting next to her, offer her choices, and engage in preferred conversation topics.
18	Staff present her food in bowls.

***We did not see instances of the behavior.*** Participant 6 was referred for yelling, name calling, and hitting. We observed participant 6 a total of 194 times. Of those 194 observations, she was asleep during 155 observations and was engaged in activities or eating during 39 observations. We did not see the behaviors occur.

***Participants met the inclusion criteria, but were not a good fit for services.*** Participant 19's husband picked her up from the facility every day. Staff reported that participant 19's behavior was that she would frequently yell at her husband, but this did not occur on site. Participant 19 also moved back home with her husband. Participant 16 moved into a different facility a few days after consent was obtained. Participant 5 was referred for whining, but after multiple observations, we identified that the participant made appropriate requests (e.g., asking to go back to her room) and required staff to fulfill those requests, as she required full assistance to move around the facility. Therefore, we did not feel it was appropriate to reduce or eliminate these requests.

***Participants passed away.*** Participants 4, 8, and 20 passed away prior to the assessment phase.

### **Proposed Outcome C: Reduce the Dosage or Number of Psychotropic Medications**

The third goal of this project was to reduce the dosage or number of psychotropic medications for participants as measured in the Minimum Data Set (MDS). Unfortunately, we were unable to meet this goal. Prior to asking administration to reduce the dosage or number of psychotropic medications, we needed to demonstrate the efficacy of our intervention. As noted above, we were not able to reach the intervention efficacy stage for most participants. Of the 20 participants recruited, 16 participants were prescribed psychotropic medications. See Table 4 for a summary of medications and reason for prescription.

Table 4  
*Summary of the Participants' Psychotropic Medications*

Participant	Medication	Reason Prescribed
1	Lorazepam	No reason prescribed documented in participant's file
	Risperidone	No reason prescribed documented in participant's file

Table 4

*Summary of the Participants' Psychotropic Medications (cont.)*

Participant	Medication	Reason Prescribed
2	Ativan	Anxiety
	Divalproex Sodium	Mood disorder and dementia with behaviors
	Mirtazapine	Depression
4	Lorazepam, PRN	Severe agitation
	Ativan	Anxiety
5	Zoloft	Depression
	Clonazepam	Generalized anxiety disorder
6	Celexa	Depression
7	Lorazepam	Anxiety
	Divalproex Sodium	Mood
	Quetiapine	Delusions
	Sertraline	Depression
	Citalopram Hydrobromide	Depression
10	Clonazepam	Anxiety
	Haloperidol	Schizophrenia
	Lorazepam	Anxiety
	Sertraline	Depression
11	Clonazepam	Anxiety
	Duloxetine HCL	Depression
	Trazodone HCL	Vascular dementia with behavioral disturbance
12	Olanzapine	Delusions
	Lexapro	Depression, anxiety
	Lorazepam	Anxiety
	Escitalopram	Anxiety
13	Ativan	Anxiety
	Depakote Sprinkles	Behavior

Table 4

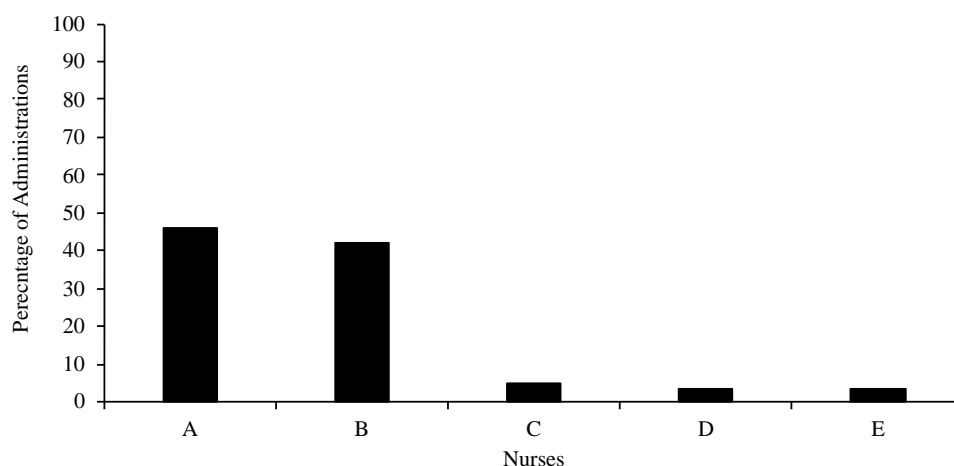
*Summary of the Participants' Psychotropic Medications (cont.)*

Participant	Medication	Reason Prescribed
14	Sertraline	Depression
	Ativan	Anxiety
15	Buspirone HCL	Anxiety
	Divalproex Sodium	Mood stability, irritability
	Escitalopram Oxalate	Depression
	Trazodone HCL	Behaviors
17	Remeron	Depression
	Seroquel	Mood
	Buspirone HCL	Anxiety
	Depakote Sprinkles	Mood
18	Lorazepam	Anxiety
	Sertraline	Depression
	Mirtazapine	Depression
19	Risperdal	Vascular dementia with behavioral disturbance, major depressive disorder
	Lorazepam	Anxiety and restlessness

Although there was no reason for prescription noted, there were instructions in the participant's file that staff should document anxiety related to lorazepam and sexually inappropriate behavior related to risperidone. Thus, it appeared these medications were prescribed for anxiety and sexually inappropriate behavior, though that was not noted in the medication file.

Of the 16 participants prescribed psychotropic medications, we only demonstrated an effective intervention for one participant (see Figure 3). Therefore, it was appropriate to discuss the possibility of reducing medications for only participant 11. Participant 11 was not prescribed a psychotropic medication for spitting. He was, however, prescribed Levsin, on as needed basis (i.e., PRN), to reduce the number of oral secretions, which in turn, may reduce how often he would spit. When we compare the number of Levsin administrations prior and during intervention, there were fewer administrations. During the time we worked with the participant, there were a total of 83 administrations of Levsin. Of the 83 administrations, 80 administrations occurred prior to intervention, 2 administrations occurred on days we ran a baseline or intervention session, and 1 administration occurred during the intervention phase, but not on a day we ran a session. We, however, cannot attribute the fewer administrations to the efficacy of our intervention. Although Levsin was prescribed as PRN, we found that some nurses administered Levsin more frequently than other nurses. As demonstrated in Figure 24, nurses A

and B had a higher percentage of administrations of Levsin than nurses C, D, and E. Over the course of the study, nurses A and B left the facility, which may account for why we saw fewer administrations.



*Figure 24.* The graph displays the percentage of Levsin administrations between nurses. Percentage was calculated by the number of Levsin administrations per nurse divided by the total number of administrations (i.e., 83), multiplied by 100.

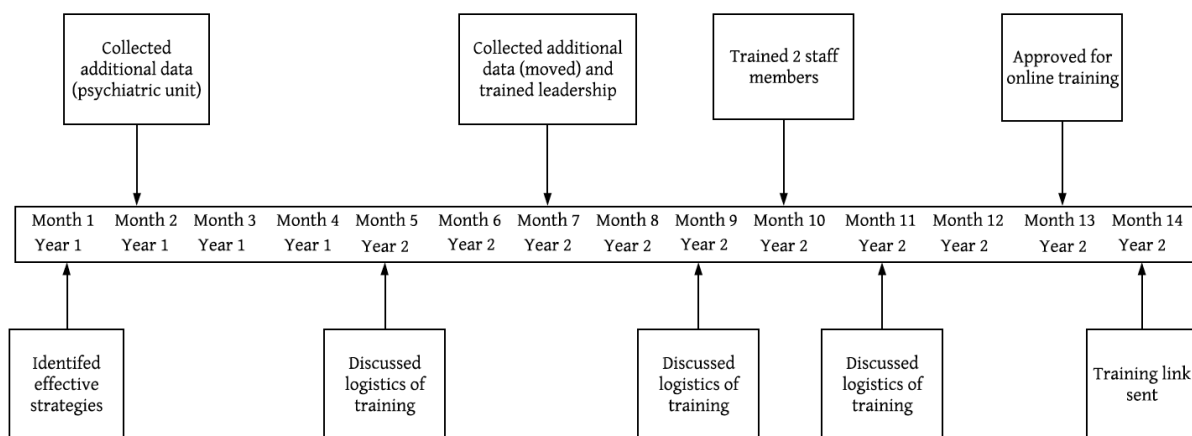
After demonstrating the effectiveness of our intervention, we asked case management if they would be open to a discussion of reducing medications prescribed for participant 11's spitting. During the conversation, case management became hesitant and would often change the subject. We broached the subject of medication changes across multiple meetings, but the case manager did not agree to explore the option. Therefore, we were unable to reduce the number of medications participant 11 was prescribed, even though we demonstrated a 50% reduction of spitting on the floor and had staff report that they liked the effective intervention.

### **Proposed Outcomes D and E: Demonstrate Staff Knowledge, Skills Acquisition, and Develop Training Materials**

The fourth and fifth goals of this project were to demonstrate staff knowledge (i.e., a minimum of 80% correct on competency-based assessments), skills acquisition (i.e., a minimum of 80% on performance-based observations), and to develop training materials that could be adopted by other sites. We created trainings for specific participants, as well as trainings with general strategies that could be applied with all residents. We did not measure staff knowledge across any of the trainings, due to time constraints. We did, however, measure performance, which has been noted to be a better measure of the efficacy of trainings (i.e., the goal of training is to get staff to engage in a behavior, not necessary to get them to talk about the behavior).

*Individualized staff trainings.* Of the 20 participants in the study, we created staff trainings for participants 15 and 11. As indicated above, we developed a staff training with strategies to reduce the frequency of 15's target behaviors and to prevent those behaviors from escalating. See Figure 25 for a timeline of events to hand the training off to leadership. The strategies consisted of providing redirection, re-approach, presenting choices (with preferred activities, food, and

drinks), and providing high quality attention when the behavior is not occurring. Prior to delivering the training, we collected baseline data on staff to determine whether they were using these strategies and whether we saw a desirable behavior change. Over the course of a year, we had to re-conduct baseline data due to the participant being sent to a psychiatric unit and being moved to a different unit within the facility. Both of these events produced a change in her environment, so we continued to collect baseline data to ensure that the behaviors were still a concern in the new environment. Following baseline, we made efforts to train staff, but we had poor attendance. Thus, the in-person training was converted to an online training and was handed off to leadership a year after the training was initially developed. Due to the changes in the delivery of the training, we were unable to collect data on staff knowledge or skill acquisition.



*Figure 25.* The figure depicts the timeline of training staff on the general strategies for participant 15.

For participant 11, we trained staff on the set up of the trashcans after we demonstrated that our intervention was effective in reducing the number of spits on the floor. During the training, we demonstrated how to set up the trashcans, observed staff set up the trashcans, and provided feedback. We trained three staff members that reliably worked with the participant, and observed three sessions in which the staff member was responsible for set up. Two of the three staff members met a minimum of 80% correct on performance-based observations. We would have continued to provide support for these three staff members, as well as train other staff members that work with the participant; however, the participant moved to a different facility, and we were no longer able to work with him.

*General staff trainings.* Training materials were created for four general strategies: 1) providing choice making opportunities, 2) promoting independence, 3) promoting behaviors, and 4) communication. The trainings were designed using a behavioral skills training (BST) approach. The components of BST include describing how to implement the strategy, demonstrating how to use the strategy, providing trainees with opportunities to role play, and providing feedback following the role play. The trainings were also developed so that they could be given online or in-person. The online format consists of videos with the content and with a demonstration of how to implement the strategy. The in-person consists of a training manual with the content, data sheets, and feedback forms.



Two of these trainings (i.e., providing choice making opportunities and promoting independence) were presented at site 1. A total of 62 staff members participated in the trainings. Of the 62 staff members, 54 staff members provided demographic information. See Table 5 for a summary of the staff demographics.

Table 5  
*Staff Demographics*

Variables	N
Age (years)	
18-25	20
26-35	14
36-45	9
46-55	7
56+	4
Gender	
Female	51
Male	4
Ethnicity	
Caucasian	29
African American/Black	18
Asian	2
Hispanic	1
Mixed	2
Education level	
High school	13
GED	2
Trade school	2
Some college	33
Associate's degree	2
Bachelor's degree	1
Master's degree	1
Job Title	
Certified nursing assistant	54
Nurse	1
Other	2
Unit Worked	
Assisted	2
Skilled	20
Memory	1
Mix	33

Table 5  
*Staff Demographics (cont.)*

Variables	N
Work Experience (years)	
<1	5
1-4	18
5-9	12
10-14	5
15-19	5
20+	12

The researchers collected procedural integrity for 50 and 43 staff members during the choice making opportunities and promoting independence trainings, respectively. After one role-play opportunity, 56% of staff members met the minimum of 80% on performance-based observations for the choice making opportunities and 79.07% of staff met the 80% on performance-based observations for promoting independence strategies. See Table 6 for a summary.

Table 6  
*Percentage Correct in Performance-based Observations per Training*

Percentage Correct	Choice Making Opportunities N = 50	Promoting Independence N = 43
100%	28	34
75%	14	4
50%	5	2
25%	3	2
0%	0	1

Following completion of the training, staff were asked to complete a feedback form and a demographics form. The feedback form consisted of 12 questions and staff were asked to rate each question using a 5-pt Likert scale. See Table 7 for the list of questions and summary of results. Overall, staff found the trainings to be effective and indicated that they were likely to use the strategies.

Table 7  
*Summary of Feedback Data*

Question	Number of Responses	<i>M</i>	<i>SD</i>
1. I find these strategies to be an acceptable way of promoting independence in older adults with memory impairment.	44	4.75	.95
2. I would be willing to use these strategies if I had to promote independence among older adults.	44	4.75	.95

Table 7  
*Summary of Feedback Data (cont.)*

Question	Number of Responses	<i>M</i>	<i>SD</i>
3. I find these strategies to be an acceptable way of creating choices in older adults with memory impairment.	44	4.67	.95
4. I would be willing to use these strategies if I had to present choices to older adults.	44	4.75	.82
5. I like the procedures described in the choices training.	44	4.67	.85
6. I believe the choices strategy is likely to be effective.	44	4.75	.85
7. I like the procedures described in promoting independence training.	35	4.63	.91
8. I believe the promoting independence strategy is likely to be effective.	35	4.63	.90
9. I believe the older adult will experience discomfort from these strategies.	35	2.63	1.12
10. Overall, I have a positive reaction to these trainings.	35	4.75	.91
11. I believe these trainings are too long.	35	2.5	1.0
12. Following these trainings, I think I can do things to impact the level of care that I provide and was not able to before.	35	3.88	.91

#### **Proposed Outcome F: Qualitative Analysis of Organization Cultural Factors that Support Outcomes A, B, C, and D**

The final goal of this project was to conduct a qualitative analysis of organizational cultural factors that support proposed outcomes outlined above.

## **Barriers to Research and the Adoption of Behavior Analytic Services in Skilled Nursing Facilities**

As we provided services to the participants, we encountered several barriers that impacted our ability to conduct research in skilled nursing facilities. A description of each barrier is described below.

*Identifying appropriate participants.* At each facility, case management (i.e., director of case management or director of social services) identified residents that would be appropriate for the study. As we interacted with staff, it became clear that case management did not seek out input from direct care staff (e.g., certified nursing assistants, director of nursing). Including direct care staff is imperative to the identification of appropriate participants, as they are the staff members who are working with the residents and with the behaviors firsthand. Unlike direct care staff, case management does not always have daily contact with the residents due to other demands of their jobs. Thus, they are less likely to see the behaviors to make appropriate referrals. As indicated above, there were several participants for which we never saw behaviors or the behaviors occurred infrequently. We, however, frequently saw behaviors that were difficult for staff to manage, but those residents were not referred by case management for this study.

*Medical rule outs.* As part of our consultation model, we look at medical rule outs before we begin assessing whether the environment has an impact on behavior. It is possible that participants may have an underlying biological condition, medication interaction, or medication side effect that is impacting behavior. For instance, older adults are at a risk for developing a UTI. In the presence of a UTI, we typically see a sudden increase in behaviors, but those behaviors decrease once the UTI has been treated. Given the relationship between medical conditions and behaviors, it is imperative that medical rule outs are done prior to behavioral assessment and intervention. We attempted to collaborate with the participants' medical team to determine whether there were biological correlates for behaviors. Unfortunately, obtaining those rule outs was challenging if not actively resisted in many cases. For instance, participant 15 was sent to a psychiatric unit due to an increase in behaviors. She had a history of UTIs, and we had asked staff if they tested her for a UTI. The UTI test was not done until after she returned from the psychiatric unit, and the results came back positive. After she was treated, the behaviors ceased. If the UTI test had been done prior to the participant being sent out as we requested, we may have avoided sending her out to a psychiatric unit (who, it is important to note, also did not test for a UTI, but made changes to her medications in an attempt to change behaviors that were associated with the UTI).

We also requested medical rule outs for participant 11, as there may have been a biological condition that impacted his ability to swallow, which in turn, increased the frequency of spitting. His medical team reported that they had attempted to do a series of tests, but were unable to complete them because the participant would become agitated. We offered to assist with the behaviors; however, there was little interest.

Additionally, in some cases we asked for a medical rule out, but were not informed whether the medical rule out was completed or what the results were. Participant 12 (referred for

sitting on the floor) had a history of back pain, and it appeared that she had an easier time walking when she was holding on to the rail. We were curious to know if she was getting on the floor to alleviate some back pain. Therefore, we asked administration if she could be assessed for pain. Administration agreed, but we were not informed of the results, even after we asked. We were also not directed to where we could find the results of the pain assessment.

*Accessible information.* We also saw a lack of information related to a participant's social, behavioral, and medical history prior to nursing home admission. Typically, staff at the facilities asked the legal guardians for a personal history; however, however, the information was not always accessible. We found that the legal authorized representative played a significant role in providing information related to the participant's history. For instance, participant 11 had a state appointed legal guardian. His guardian had met him twice, was not heavily involved with his case (e.g., did not come to the facility, wanted brief updates instead of being actively involved in care conferences), and could not answer questions about his history. As we worked with him, he was assigned a new legal guardian, and she had no information about his history.

There were instances in which a participant's legal authorized representative was a family member, but the information was not helpful. For example, participant 4's wife was heavily involved. After we reviewed his medical record, we had some questions about his diagnoses and asked his wife. She provided vague information, but she gave us the names of his doctors prior to admission and offered to sign a release of information form to help us gather the necessary information.

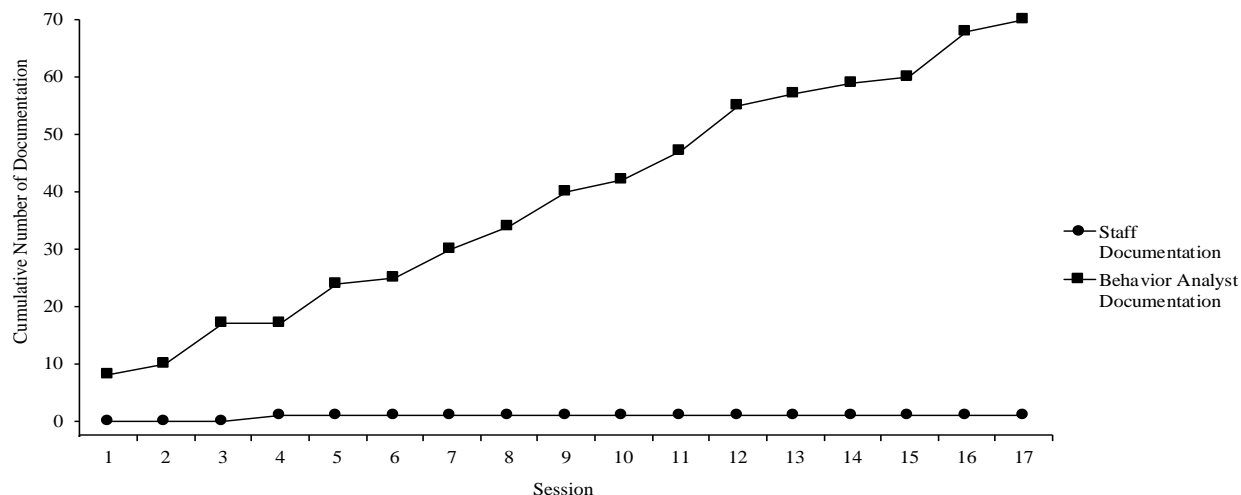
We also encountered instances in which the participant's legal authorized representative was a family member and provided helpful information. Participant 9's family was heavily involved and provided us with information about her history. In fact, her husband wrote a summary of 9's life (e.g., occupation, hobbies, volunteer work) and included events that had a significant impact on her current health (e.g., falls, strokes). Her husband was also heavily involved in her care and could answer questions related to the behavior (e.g., when the behavior first occurred, previous interventions used). Further, her husband and a few of her children gave us their phone number so that we could contact them when we had additional questions about her history. This level of involvement and accessibility to information was not common for many of our participants.

Access to each participant's history impacts the delivery of behavioral services. From the perspective of a behavior analyst, it became challenging to determine patterns in behavior. If the behavior did not occur prior to admission, then this suggests that there is something in the nursing home environment (that was not present in the environment prior to admission) that is maintaining the behavior. If the behavior did occur prior to admission and continued to occur in the nursing home, then it became difficult for to identify those patterns when their legal authorized representative did not have that information. It also had implications on medical rule outs, as details about the history may have provided insight to which medical rule out was necessary. Lastly, the participant's history had significant implications with the care that is provided within the facility because changes to treatment were made without considering the participant's whole personal history.

*Documentation.* As behavior analysts, we document behavior as a way to track the behavior, to identify whether there are patterns in behaviors, and to determine whether there are data to support treatment changes. When we reviewed each participant’s medical records, we reviewed staff documentation to help identify patterns in behavior, identify when the behavior occurred, and identify strategies that have been used. We, however, found that documentation did not help us gather such information.

We saw three potential forms of documentation. One form was staff progress notes. It was common for staff to write undescriptive notes, such as, “numerous vocal outbursts today, not directed towards anyone” or “resident yelling and throwing things all day.” These undescriptive notes do not provide us with information related to what happened before and after the behavior. These notes were also less likely to be representative of what happened. It was likely that the participant engaged in the behavior multiple times per day, but it was less likely that the behavior occurred for the entire duration of the staff member’s shift. There was also little information regarding interventions used to manage the behavior. We also could not identify the times the behavior was likely to occur because the time stamps on each progress note reflected the time the note was documented (e.g., towards the end of the shift), not when the behavior occurred.

Another form of documentation consisted of behavior logs, which included information regarding where the behavior occurred, what the triggers were, the behavior, what intervention staff used, and the impact the intervention had on the behavior. If staff were already collecting data on these variables, it could save behavior analysts time in narrowing down the times and settings of when the behaviors occur. Unfortunately, in settings where this data collection system was in place, staff were not actually filling out the behavior logs. As noted above, we conducted 1-hour observations on how often participant 12 disrobed. We compared how often we recorded the behavior in each observation to how often staff documented the behavior for that same day. As demonstrated in Figure 26, the behavior was occurring often, but staff were not documenting the behavior nearly as often as it was occurring. This was a common issue for many participants that we worked with. Thus, behavior analysts cannot rely on staff documentation because it inaccurately depicts when and how often the behavior is occurring.



*Figure 26.* The graph displays the cumulative number of times the behavior was documented by staff or by the behavior analyst. The cumulative number was calculated by adding each instance the behavior was recorded to the previous record of the behavior. Staff documentation is presented as circles, and the behavior analyst's documentation is presented as squares.

A third form of documentation was a follow-up report. When staff logged into Point Click Care, they were prompted to select which behaviors occurred during their shift. As we examined the results of the follow-up report, we found that staff sometimes had to improvise because the options provided did not match the behaviors of the residents. For instance, participant 15 was referred for exit seeking, but this was not a behavior staff could choose from. Instead, staff were selecting wandering, and as a result, we saw documentation for the wrong behavior. In fact, we spent multiple weeks attempting to observe wandering before we discovered that they staff had used that to documenting exit seeking. Similar to staff progress notes, the follow-up report also included time-stamps, but the time stamps were when staff documented, not when behaviors occurred.

*Interviews with Staff.* We conducted an interview with staff to gather information regarding the behavior of concern, information about what happened before and after the behavior, and previous interventions used and whether they were (in)effective. One challenge we encountered was identifying the right staff member to interview. We need to interview staff members who have worked with participant frequently, as they can provide more details about the participant. Sometimes we were referred to a staff member who worked with the participant occasionally or the staff member recently started working at the facility. As we started the interview, the staff member reported what other staff members had said but did not report anything that the she or he had directly observed. There were also other times that we were referred to a nurse. Although nurses provided valuable information about the participant, the nurse typically could not provide information related to behaviors that occurred during care as they were not doing the care or in the room while the care occurs. Once we identified the appropriate staff member to interview, we encountered difficulties scheduling a time to do the interview. We asked staff when they would be available to complete the interview. After a time and day were identified, the staff member was often unavailable due demands of the job or in some cases had scheduled a time on their day off. There were other times during which the staff member could not leave the unit, and if they did, the staff to resident ratio would have been too low.

*Data collection.* Following staff interviews, we collected baseline data so that we could compare results from the intervention phase to baseline to determine whether our intervention was effective. If it was effective, we would expect to see fewer instances of the behavior in comparison to baseline. If we were teaching a skill, we would expect to see an increase in the behavior in comparison to baseline. In this setting, however, collecting baseline data proved to be difficult due to lack of control in the participant's daily schedule, medication changes, room changes, and staff changes. When these changes occur, we had to extend baseline to identify whether the behavior was still occurring or if other behaviors became a concern. This also became an issue when we were in assessment or intervention, as collecting data while these

changes were occurring could skew our data and were not representative of what typically happened. We typically had to wait for the participant to adjust to the changes.

We also saw instances of the behavior infrequently or we did not see the behavior occur for several participants. When we followed up with staff, they reported that behaviors were still happening, but it was variable in when the behaviors would occur. In these instances, we created a data sheet and asked staff to collect data for us. Unfortunately, staff data collection was not supported by the facility. As described above, we created a data sheet for participant 15. This form of data collection was approved by case management, supported by staff, and they were collecting data for us with fidelity. However, the director of nursing asked staff to stop using our form of data collection as it was not their standard format.

We also encountered issues directly observing the behaviors. Several of the participants (e.g., 17, 18) engaged in BPSDs during personal care tasks (e.g., bathing, dressing, and toileting routines). In efforts to observe these behaviors, we asked staff to identify estimates of when these care tasks occur and asked staff if we could observe the care tasks. We would schedule our time in blocks that were longer than the estimated blocks from staff, so as to ensure we would be present to capture to care task. In many instances, when we arrived to the unit to observe the care tasks, staff reported that the care tasks were already done or that they would do it later, but did not know when the care would happen. When we are unable to observe the behavior, we were unable to conduct an assessment, develop an intervention, and implement an individualized intervention.

*Staff turnover.* In nursing home settings, it is common for staff turnover to be high. High staff turnover had a significant impact on providing behavior analytic services. Every time a new staff member worked with a participant, we had to take a step back in our process. For example, if we finished collecting baseline, we would extend baseline to determine whether the behavior would still occur in the presence of the new staff member, as different approaches utilized by staff regularly play a key role in the occurrence or non-occurrence of BPSDs. If we were in assessment, we would have to redo the assessment. For instance, participant 9's baseline and assessment took six months to complete. Over the course of six months, we worked with three staff members. When each staff member started working with the participant, we had to train the new staff member on the assessment. Following assessment, we would have started intervention, but due to a new a staff member working with the participant, we went back to baseline to ensure that the change in the environment did not impact the behavior. This was our ethical responsibility because it would not be appropriate to train staff to implement a procedure if it was no longer needed, but it we also needed to ensure that the procedure that was appropriate based on our observations of one staff would still be appropriate with the new staff.

Staff turnover also meant we would lose the staff rapport we had worked so hard to establish. Staff in these settings are often over worked and leery of outside observation that may result in asking them to do things different from what they are doing. We spent several months establishing rapport with staff, and as a result, we relied on staff to provide us with information regarding each participant. We also had strong relationships with staff that resulted in staff advocating to get us information. When staff left the facility, we lost that progress, and we had to start over in building those relationships. Ideally, the pursuit of the best care and supports for



residents of nursing homes should not require months of rapport building, but our experience across all four sites was that without establishing that rapport, we would not have received any useful data or information.

*Communication.* Across all sites, we encouraged a collaborative approach and open communication with case management. To help facilitate this approach, we met with case management on a monthly basis to provide updates on each participant and to address any concerns that came up in the previous month. Although we met on a monthly basis, we had to wait to address our concerns (e.g., data collection, medical rule outs) until we had that meeting. We made efforts to reach out to case management in between the monthly meetings; however, we did not receive an update or plan to address the concern until those meetings.

Additionally, the leadership team (e.g., director of nursing, licensed nurse practitioner, case management) made changes to the participants' treatment, and we were not informed of those changes until the monthly meetings. Most changes to treatment were related to medication changes. It was common to hear staff report there was an increase in behavior, but they had little data to support this increase. We collected data on multiple variables across time, and we presented these data to case management. Our data, however, were not used to inform treatment, and all treatment decisions were made without collaborating with us.

We also encountered communication issues with third party providers. At some facilities, a psychiatrist provided treatment recommendations for participants. Case management worked closely with the psychiatrist, but case management did not report what services we were providing for their clients. We wanted to encourage a collaborative approach with the psychiatrist, as he or she may have delayed medication changes pending results of our assessment or intervention. We also wanted to present our data that could help the psychiatrist make data informed decisions. Unfortunately, information about when the psychiatrist would be at the facility was unavailable. Administration reported that the psychiatrist did not come on a set schedule, and they typically do not know when the psychiatrist was going to be present until the same day.

## Current State of Care

Over the last three years, we identified several concerns related to the current state of care that is provided in skilled nursing facilities. A description of each concern is described below.

*Staff training.* The majority of staff members we worked with had limited knowledge of NCD and how to effectively manage BPSDs without the use of medications. The Michigan Department of Licensing and Regulatory Affairs Bureau of Health Care Services (2014) requires that certified nursing assistants complete 75 hours (comprised of class, lab, and clinical hours). Of those 75 hours, certified nursing assistants are required to complete 4 hours related to care of a resident with cognitive impairment, and the approaches or recommendations reviewed are empirically supported. Although they have little training in older adults with cognitive impairment and behaviors, they are likely to be employed at nursing home facilities. Upon hire, they are required to participate in an orientation and training program. Similarly, interviews with facility leaders revealed great variation in the duration and quality of training related to NCD. We had the opportunity to participate in the same orientation and training programs at each facility. Although each facility had a different approach to orientation and training, they all had a common theme. They provided additional information related to their job descriptions, promoted knowledge about NCD, and listed behaviors that staff were likely to encounter. They did not teach specific techniques that staff could use while working with an older adult engage in BPSD.

As we interacted with staff, several staff members reported that there are few resources made available to help them manage BPSDs and wished there were additional trainings. We reported this to leadership and offered to provide general trainings on how to work with this population. Leadership was excited for us to offer these trainings, but there was never follow through. If the training was not related to providing care (e.g., using a gait belt, transfers, washing residents), then the training was not supported by the current nursing home system. This was evident by our efforts to train staff on how to manage participant 15's behaviors. Setting aside times to provide the training proved to be difficult, and it took a year before the training was handed off to leadership. If the training was related to the safety of transferring residents, it is likely that the training would have been made available immediately. Effectively managing BPSDs can allow for better care, and it is likely that staff will have an easier time and more time to complete their daily tasks.

*Staff data collection.* We also identified systemic issues associated with rigidity of existing processes. For example, we created a new form of data collection (see participant 15 described above) that was easier for staff to use, required little effort from staff, and resulted in an increase in data collection. Although we demonstrated that we could increase documentation, this form of documentation was immediately terminated by leadership because it was not part of their existing documentation system and because it took time away from their existing documentation (which, it is important to add, was not being completed accurately or regularly).

*Care plans.* Each participant had a care plan, which identified a focus, goal, intervention/tasks, and assigned staff roles for each task. See Figure 27 for a snapshot of what a care plan looked like for participant 17's behaviors. Although this care plan outlined the behaviors and provided suggestions for interventions, there were several limitations that

impacted the quality of care provided. One issue was that the goals were not clearly defined and were not appropriate for each item under the “focus” column. The care plan stated that she will have fewer episodes of the behavior, but the care plan did not indicate which behavior we are targeting. We could assume that we were targeting all the behaviors listed in the “focus” column. It would be appropriate to want fewer instances of kicking, swearing, and disruptive vocalizations; however, this goal is not appropriate for second item that states she has vascular dementia, depression, and will sleep long hours. It seems unnecessary to have goals related to the names of the diagnoses. It would be more appropriate to have goals related to the behaviors (e.g., swearing, kicking) associated with those diagnoses. Also, these facilities were utilizing a person-centered care approach, in which staff reported that the participant may sleep for as long as she would like. In order for this goal to be met, staff would have to wake the participant.

Focus	Goals	Intervention/Tasks	Party Responsible
I sometimes get upset with care. I may swear at staff and try to kick them.	I will have fewer episodes of behavior by review date.	Anticipate and meet my needs. Offer resident to lie down when she has been up and begins to become restless, vocalizing, as they may be signaling overstimulation or overtiredness.	Certified nursing assistant
I have a behavior problem r/t vascular dementia and depression. I may sleep long hours.		Please try the following interventions if I become upset: hold my hand, remain calm, talk to me about JcPenney’s, ask activities for shiny/sparkly jewelry. If I am grumpy or refuse care, tell me that you love me.	Social workers, certified nursing assistant, activities staff, nursing staff
I verbalize often and loudly, and this puts me at risk for other residents to become unhappy with my vocalizations.			

Figure 27. A snapshot of participant 17’s care plan.

Additionally, there was no specific measurement system to determine whether the goal had been met. It was not sufficient to state that fewer episodes would occur by the next review date, as there was no documentation of how many instances had occurred at the current review date. We would need to know how much reduction is necessary and along what dimension of behavior (e.g., frequency, duration) we are targeting. This would also need to vary across behaviors. For instance, we could have targeted the *number of times* participant 17 kicked staff during cares, but we may target *how long* participant 17 screamed. The goal should have also included the conditions in which fewer instances of the behavior should occur and how the behavior would be measured. For instance, the goal could have been re-written to, “the participant will have a 50% reduction in kicking staff during care routines, as compared to data collected on [date range], as measured by staff tallying each instance of the behavior.” This

would make it clear as to what reduction was needed given the setting and who was responsible for measuring the behavior.

Further, the goals should be realistic. Realistic goals must be determined based on data. During the quarterly reviews, case management examines how often the behavior is noted to occur. This could function as baseline data; however, as noted above, staff documentation is insufficient and does not provide an accurate representation of what is happening. As demonstrated in Figure 26, staff did not document when participant 12 was engaging in the behavior. In her care plan, it stated that behaviors would be reduced by next review date. Upon review of documentation, she would have met this goal, but it was not because the behavior was occurring less often. It was because staff were not documenting how often the behavior was occurring. When goals are identified as met, we might not see changes in treatment, but given that the behaviors were occurring, a change to treatment may have been warranted as it was not effective in reducing the behavior.

There may also be a need to make changes to the behavioral interventions that are listed in Figure 27, but support is needed to make those decisions. The listed interventions were not informed by assessment, and there was little documentation about the efficacy of the interventions listed. Some staff may have documented, "...had episodes of yelling out this morning loudly in the common room. Redirection and methods of distraction and calming down were ineffective" or "...yelling sporadically throughout the day, unable to console." If we compared these progress notes to the interventions noted in the above care plan, we could not know the specific intervention that was ineffective. There was no detail regarding how the staff member tried to redirect or console the participant. For example, was it that they offered for the participant to lie down, talked to her about JcPenney's, or told her that they love her? Without this information, it becomes difficult to determine whether the resident's goals need to be changed.

We also found several participants with the focus, goal, and intervention/tasks outlined in Figure 28. While it is appropriate to have a goal related to maintaining the participant's current level of functioning, monitoring, documenting, and reporting any changes in cognitive functioning is not an intervention that would result in maintaining functioning. Instead, those are ways to obtain data on functioning level. In the *Proposed Outcomes A and B: 50% Reduction in Verbal Agitation, Non-verbal Agitation, and BPSD* section, we demonstrated that modifying the environment can reduce behavior (i.e., spitting on the floor, disruptive vocalizations), increase a participant's functioning (i.e., teaching an alternative form of communication), and maintain a participant's current level of functioning (i.e., increase in food consumption). Results of this study demonstrated that there needs to be interventions in place that target specific skills geared at individual success. Without these interventions, we would likely to see a further decline. Unfortunately, staff at all levels of the facilities had limited little awareness of any empirically supported interventions available that could help support this goal.

Focus	Goals	Intervention/Tasks	Party Responsible
I have impaired cognitive function/dementia or impaired thought processes r/t dementia.	I will maintain current level of cognitive function through the review date.	Monitor/document/report to MD any changes in cognitive function, specifically changes in: decision making ability, memory, recall and general awareness, difficulty expressing self, difficulty understanding others, level of consciousness, mental status. No assigned tasks.	No staff assigned

*Figure 28.* A snapshot of a common focus, goal, intervention/tasks in participants' care plans.

*Pharmacological interventions.* As demonstrated in Table 4, most participants were prescribed psychotropic medications. The Centers for Medicare and Medicaid Services (CMS; 2017) requires facilities to document the administration of those medications, evaluate effectiveness of the medications, and identify whether the resident is experiencing any adverse consequences. Due to the clear requirements about documenting the administration of medication, this was one area of documentation that was appropriate and was done well. In addition to documenting the use of the medication, we found that staff monitored whether there were side effects or behaviors after each medication administration. For example, if Lorazepam was prescribed for anxiety, staff may have had to monitor whether the individual experienced dizziness, daytime sleepiness, pacing/wandering, or agitation.

Although staff were documenting behaviors associated with the medication, there are still some concerns about the specificity of the behaviors. The most common reasons for prescribing a medication were depression, anxiety, and mood (see Table 4). These reasons are broad, as there are several behaviors that are often grouped under the label as depression and anxiety. For instance, depression may be evident by social isolation or crying. When staff document the behaviors associated with the medications, they may be documenting different things. For instance, a staff member may document depression when the resident remains in his/her room instead of engaging in the scheduled activity, while another staff member may document depression when the resident is crying. Both behaviors may be indicative of depression, but both behaviors would warrant different treatments and different changes to treatment. The lack of specificity also makes it difficult to know when staff should have been documenting and how those behaviors (when "behaviors" was listed as the reason for prescription) differed than the ones grouped under the broader categories (e.g., depression, anxiety).

We also found that this level of documentation, however, is not required when medications were used off label. One commonly used off label medication was Depakote, also known as Divalproex Sodium. Depakote has similar adverse effects (e.g., drowsiness, nausea,

mood swings) as psychotropic medications. During a monthly meeting with case management, a case manager indicated that she recommended this medication for some of our participants, as well as for other residents. She followed up her recommendation with, “Depakote is my friend. You don’t have to document it.” As demonstrated in Table 4, five participants were prescribed Depakote for mood and behaviors, suggesting that there were five participants for which we were likely to lose documentation related to behaviors because there was no expectation to do so. This also presented an issue in that clinicians were recommending other medications to suppress behavior without the need to document the associated behaviors or side effects.

Prior to prescribing a psychotropic medication, CMS (2017) requires staff to document that non-pharmacological interventions have been attempted, evaluated, and demonstrated to be ineffective. They also require that the resident’s symptoms and therapeutic goals are clearly identified and documented (CMS, 2017). Non-pharmacological interventions must also continue to be evaluated when nursing staff begin a gradual dose reduction (GDR). A GDR must be attempted when “the resident’s clinical condition has improved or stabilized, the underlying causes of the original target symptoms have resolved, and/or non-pharmacological approaches have been effective in reducing the symptoms” (CMS, 2017, p. 491). As described above, the care plans are unclear, and there is a lack of documentation regarding the use of such interventions. Thus, it is difficult to determine whether the non-pharmacological interventions are effective because there are no baseline data to compare it back to. If the non-pharmacological intervention was ineffective prior to the administration of the medication, it is likely that it will not be effective once the dosage is reduced. This is because the non-pharmacological interventions are not informed by assessment and do not address the cause(s) of the behavior(s). The environment will not support a desirable behavior change.

Additionally, there is some ambiguity to in how long a GDR is attempted before a decision is made about whether decreasing or increasing the medication is needed. CMS notes, “The time frames and duration of attempts to taper any medication must be consistent with accepted standards of practice and depend on factors including the coexisting medication regimen, the underlying causes of symptoms, individual risk factors, and pharmacologic characteristics of medications” (CMS, 2017, p. 492). Due to pharmacokinetics in the older adult population, it may be difficult to determine how long a GDR should be because there are many variables that impact the half-lives of medications. Once a GDR is attempted and there is an occurrence of the behavior a day later, it is too early to determine if this is due to the GDR. Staff should have clear guidelines for GDR attempts for each psychotropic medication.

Lastly, CMS (2017) requires that GDRs must be attempted in two different quarters during first year of prescription and annually after the first year. Over the course of the three year study, we saw GDRs occur for only three of the 16 participants. Each time a GDR was attempted, administration notified staff and encouraged staff to document each instance of the behavior so that they could determine whether the dose could be decreased. Even though we want staff to document behavior, it creates a problem when staff are notified of the GDR. This is potentially problematic because there had not been an emphasis on documenting the behavior prior to the GDR. This could result in a situation in which data are inflated due to increased attention to behaviors. Unfortunately, there is no way for surveyors to know if behaviors were accurately documented prior to the GDR.

## Discussion

We identified common issues that existed in all recruited facilities, and these issues had a negative impact on the quality of care that is provided to older adults with NCD in nursing home facilities. The Omnibus Budget Reconciliation Act of 1987 mandated that behavioral interventions be used prior to chemical or physical restraints to manage BPSDs. CMS has also pushed for behavioral interventions by launching the National Partnership to Improve Dementia Care in Nursing Homes to decrease the use of antipsychotic medications, increase the use of non-pharmacological approaches, and increase the use of person-centered care practices (CMS, 2014). In fact, there was decline in medications from 23.9% to 14.6% between 2011 and 2018 (CMS, 2019).

Although there has been some success in reducing the use of pharmacological interventions, we propose that these efforts are not enough and additional legislative changes need to be made to better our current standard of care for older adults living in skilled nursing facilities. Since 1987, there has been a growing body of literature supporting the use of function-based interventions in managing BPSDs (e.g., Baker, Hanley, & Mathew, 2006; Buchanan & Fisher, 2002; Larrabee, Baker, & O'Neill, 2018; Trahan, Donaldson, McNabney, & Kahng, 2014). In fact, a recent meta-analysis concluded that function-based interventions “should be used as first line management of BPSD” (Dyer, Harrison, Laver, Whitehead, & Crotty, 2017, p. 1). Based on the results from the current study and previous literature, “OBRA should be updated to require that interventions based on behavioral function be used prior to any chemical restraints being prescribed. This advancement would parallel that which occurred in public education, in which functional assessments are required prior to using strategies that remove children from classroom learning environments (Individuals with Disabilities Education Act, 1997)” (Baker et al., 2006, p. 474).

In addition, the recruited nursing homes were meeting the guidelines written by CMS. Those guidelines, however, were loosely written and need to be revised in order to provide therapeutic services to older adults in nursing home settings. Simply noting that documentation is needed to demonstrate the effectiveness of non-pharmacological interventions, to demonstrate the rationale for the medication, and to track whether the resident is experiencing adverse effects is not enough. Nursing homes need to adapt a care plan similar to the behavior support plans that are written for individuals with intellectual and developmental disabilities, which include clearly defined goals and measurement systems that allow for accurate representation of whether the goals are met. This, however, will not be adopted unless there are guidelines set by CMS. This level of documentation will require time, especially when it is currently not embedded in the system, but once it is established, treatment decisions will be guided by data.

Lastly, there needs to be changes in legislation that create job openings for behavior analysts in long-term care facilities. Behavior analysts use empirically supported approaches to assess and treat behaviors. As demonstrated by the current study, the behavior analysts were successful in reducing behaviors, as well as maintaining current level of functioning. The behavior analysts were also faced with multiple barriers that impacted their provision of services.

When behavior analysts are part of the nursing home system, services can be provided with few barriers. Unfortunately, behavior analysts are not typically hired in nursing homes. To our knowledge, the only nursing home that hires behavior analysts is the Minneapolis Veteran's Home in Minneapolis, Minnesota.



## **Conclusion**

In summary, the purpose of the project was to provide behavioral consultation to older adults engaging in BPSD in skilled nursing facilities. We aimed to meet the following outcomes: 1) reduce verbal agitation, non-verbal agitation, and BPSD by 50%, 2) reduce the dosage or number of psychotropic medications for residents that we demonstrated an effective behavioral intervention for, 3) demonstrate staff knowledge, skills, acquisition in individualized staff trainings, as well as develop training materials that could be adopted across facilities, and 4) analyze the organization's cultural factors that support the previous outcomes. Upon review of each outcome, we encountered several barriers that impacted the delivery of services, as well as concerns related to the current standard of care. We hope that the findings of this project, we can begin to advance and improve the current practices in skilled nursing facilities. Although these changes require time and effort, they will increase the quality of treatment and care that is being provided to older adults in long-term care facilities.

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