

Using Functional Behavior Assessment in Reducing Classroom Challenging Behaviors of Severe Autism Spectrum Disorder' Students

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Abstract

The main objective of this research was to examine the effectiveness of utilizing functional behavior assessment strategies for reducing disruptive behaviors observed in classrooms with students diagnosed with severe autism spectrum disorder. Furthermore, the study aimed to assess the impact of a training program on the knowledge of participating teachers regarding the implementation of these assessment strategies. The study included a sample of 6 students with severe autism spectrum disorder who were randomly assigned to a single case study group. Additionally, two teachers from each selected classroom were chosen to receive training on functional behavior assessment strategies, which they then implemented with the students. The knowledge of these teachers was measured both before and after the training program. The findings of the study indicated a statistically significant difference ($p = < 0.05$) in the post-test results, highlighting the effectiveness of using functional behavior assessment strategies. Moreover, there was also a significant difference ($p = < 0.05$) in the knowledge of the trained teachers.

Keywords: Functional Behavior Assessment, Autism Spectrum Disorder, challenging behaviors, Behavioral Problems.

Introduction

Autism Spectrum Disorder (ASD) is characterized by major communication problems, which frequently necessitate the use of augmentative means to explain students' needs. Many students with ASD engage in motor behaviors that are socially unacceptable, such as stereotyped actions, violence, self-injury, or property destruction (Luiselli 2011). These behaviors, often known as "challenging behaviors," include a wide range of maladaptive actions that might injure the individual or others, disrupt classroom procedures, and stigmatize students in social situations (Matheis et al., 2018).

Disruptive behavior is described as behavior that strives to violate social norms—resisting or rejecting an established order that a group or community values or enforces. Examples include being angry, opposing, defying, causing harm to others, and damaging property (Gaete & Gaete, 2021). Such behaviors provide substantial challenges for teachers and caregivers, frequently resulting in emotional weariness and impaired educational efficacy.

It is estimated that 94% of individuals with ASD engage in challenging behavior, making effective intervention crucial to reducing these behaviors and preventing negative outcomes (Davis & Rispoli, 2018). Various strategies are employed to address behavioral problems, with one of the most important being Functional Behavior Assessment (FBA). "FBA technology can identify factors influencing problem behaviors and reorganize the environment to both reduce problem behaviors and develop positive skills. In a variety of settings and with diverse student behaviors, Functional Behavior Assessments have produced desired results" (Missouri Department, 2017).

This study is significant since it has both theoretical and practical implications. In theory, few previous research in the Gulf or Arab region have evaluated the effectiveness of FBA in improving behavioral difficulties in ASD. Practically, the study provides a new viewpoint on establishing educational environments adapted to the unique requirements and severity of students with ASD, rather than general categories, as well as ways for promoting positive behaviors. The use of FBA techniques in Arab schools, where there is little empirical support, makes this study novel. The study advances the social sciences by providing useful insights for inclusive education and evidence-based interventions catered to local needs by showcasing the efficacy of FBA in lowering disruptive behaviors and improving instructors' expertise.

Literature Review

Functional behavioral assessment (FBA) involves a group of procedures used to gather information about antecedents, behaviors, and consequences to determine the reason (function) of the behavior, such as aggression or self-injury (Neef & Peterson, 2007). The function of behavior refers to the purpose that behavior serves for the individual. Behavioral functions are typically classified into five categories: (a) social attention/communication (positive social reinforcement), (b) access to tangibles or preferred activities (material or activity reinforcement), (c) escape, delay, reduction, or avoidance of aversive tasks or activities (negative reinforcement), (d) escape or avoidance of other individuals (negative social reinforcement), and (e) internal stimulation (automatic or sensory reinforcement) (Rasheed et al., 2012).

Basic interventions in the behavioral plan based on the functional behavior assessment include: Changing behavior antecedents through behavioral contracts, controlling pre-stimuli, and teaching alternative positive behaviors; changing behavior consequences by ignoring the behavior, removing rewards, and using timeouts (Baker et al., 2004/2017).

Direct observation under natural conditions is used in the descriptive functional behavioral assessment to identify environmental factors associated with target behaviors, such as aggression or self-injury. The indirect functional behavioral assessment employs questionnaires, checklists, rating scales, and interviews to determine the environmental variables causing extreme behaviors. Only through a functional (experimental) analysis can environmental events be manipulated to determine the causes of aberrant behaviors, such as attention or escape (Williams & Williams, 2010).

Data collected by FBA should be used to develop an actual Behavior Intervention Plan (BIP) aimed at improving a student's behavior by redesigning the environment and developing new skills that make the problem behavior inappropriate and inefficient in that environment.

The purpose of the BIP is not to control the student but to enable the student to succeed in their surroundings (Mississippi Department of Education, 2015).

According to Neitzel and Bogin (2008), there are seven steps to make behavior intervention plan according the functional behavior assessment process, as illustrated in Figure 1 below:

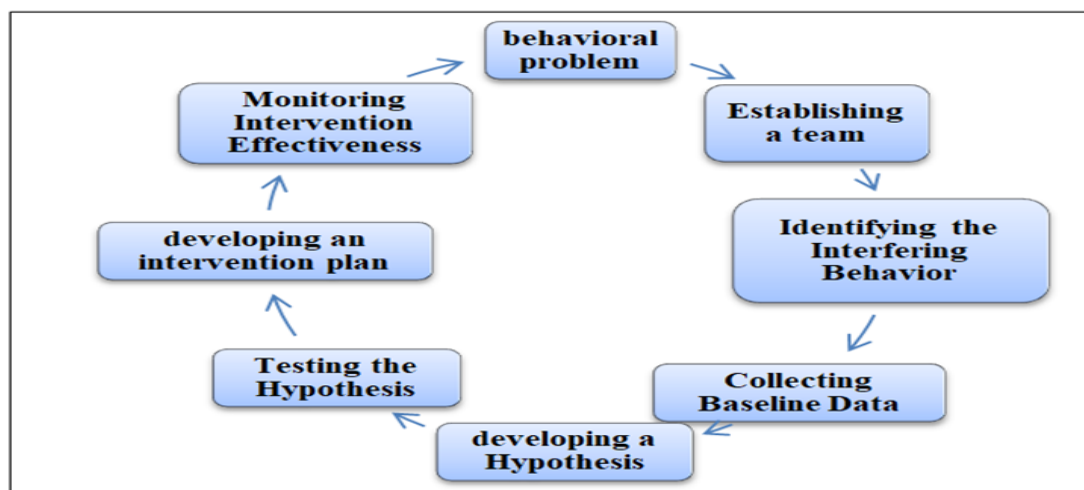


Figure 1 Functional Behavior Assessment Steps

Challenging behavior negatively impacts the effectiveness of teaching. Special educators working with ASD students report higher levels of emotional exhaustion when faced with behaviors they cannot manage (Bloisi et al., 2007). Classroom teachers today need a wide range of resources and excellent management skills, as well as subject-matter expertise and effective teaching abilities. Teachers knowledgeable in the fundamental principles of FBA can address behavioral issues before they become so disruptive that external resources are required (Young & Bauer, 2013). The study addresses two main problems: The presence of numerous interconnected behavioral issues that the center's current behavior modification techniques cannot effectively treat; the difficulty in completing educational tasks and skill development for students when each student exhibits a variety of behavioral issues (Alsalahat & Ahmad, 2022).

Methodology

This study is a single-case experimental study using the ABA design, which includes three distinct measurement periods: Baseline (A), During Intervention (B), and Post-Intervention (A). Initially, the baseline state is carefully observed and measured (A). Once a consistent pattern of baseline responses is established, the intervention is implemented, and the condition is repeatedly measured (B). Following this, the treatment is removed, but the condition continues to be measured for a period (A). The study randomly selected a group of six students with severe autism spectrum disorder (ASD) from a single class, along with their two teachers. Quantitative data will be collected using checklists and direct observation forms for students' behavioral problems, as well as a knowledge test on the teachers' understanding of functional behavior assessment (FBA).

The study population consists of severely ASD students at Al Ain Autism Center in the UAE, aged 8-14 years (N=42). The sample included six severe ASD students, randomly assigned to two groups, meeting the following criteria: male students classified under the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as having severe ASD/requiring very substantial support, exhibiting clear classroom and disruptive behavioral problems, and having teachers willing to participate in the program.

The purpose of this study is to investigate the effectiveness of functional behavior assessment strategies in addressing disruptive classroom behaviors among students with severe ASD, compared to traditional behavior modification programs. Additionally, the study aims to assess the level of FBA knowledge among teachers of students with severe ASD after training sessions.

The current study attempts to answer two main questions, which are: Is there a significant difference in behavioral problem scores among students with severe ASD due to functional behavior assessment strategies? Is there a difference in FBA knowledge among teachers of students with severe ASD after training sessions?

Instruments and procedures of the Study

The study utilized two main instruments: the Behavior Intervention Manual (BIM) and the Knowledge and Perception of Functional Behavioral Assessment (KPFBA) tool. The BIM, developed by the San Joaquin County Office of Education's Special Education Local Plan in 2007 and revised in June 2015, includes forms for functional behavior assessment and strategies such as supporting positive behavior, changing stimuli that lead to behavioral problems, and teaching and reinforcing alternative behaviors. The KPFBA, created by Martin (2016), was used to evaluate the teachers' knowledge of FBA. Both tools were adapted into Arabic for this study.

The study was conducted over eight weeks, from late April to early July 2022, following these steps: I. Approval: Obtained from the Al- Ain Autism Center to conduct the program. II. Teachers Training: Two special education teachers in the experimental group were trained on FBA mechanisms, form-filling, and program implementation for one week. iii. Pre-Observation: Teachers conducted pre-observations of selected disruptive behaviors. iv. Intervention Plan: Constructed a behavioral intervention plan for the experimental group. V. Implementation: The program was implemented over seven weeks (5 days a week) with the following phases: Pre-intervention (1 week), Intervention (5 weeks), and Post-intervention (1 week). Vi. Selection: The classroom and six students with severe ASD, along with two teachers who consented to participate, were selected randomly from five classes and ten teachers using a lottery method.

Training Program Protocol

Before implementing the program, the participating teachers experienced training, which included: **Duration:** 5 consecutive days, with daily sessions of three hours each, totaling 15 hours. **Components:** The training included theoretical information and practical exercises on FBA methods and handling severe behavioral problems in the classroom; and **Workshop Procedures includes:** Defining training objectives, workshop content, duration, and participation regulations; Pre-evaluation of participants' FBA knowledge; Initial workshops

focused on welcoming new students, appropriate evaluation techniques, and classroom preparation; Subsequent workshops provided detailed explanations of FBA strategies, concepts, principles, and forms, along with step-by-step application and follow-up; Post-evaluation to assess the effectiveness of the workshops using the same test tool as the pre-evaluation; and completion of training evaluation forms by participants to assess the content and the lecturer/researcher.

Baseline

During the pre-intervention phase, the most critical behaviors requiring treatment were identified and observed. The study used specific forms to calculate the frequency of behaviors in students and to determine the functions of each behavioral problem. Table 1 describes the frequency of data collection.

Table 1

Single group behaviors data

Name	Age	Behavior	Behavior Description
Salem.	11.6	Getting out of the seat during training.	During training, Salem frequently gets up from his seat, quickly uses the bathroom, turns on the tap, and then resumes playing. He never returns to his seat.
Abdul-Aziz.	12.8	Throwing of center and class chairs constantly.	Abdul-Aziz throws the chairs that greet him as soon as he enters the center. Once he is seated, he continues to get up and throw the chairs in the opposite direction. He also pushes the chairs firmly and repeatedly as soon as he is sent to the class.
Abdullah. K	12.8	Chewing/Eating the small plastic study schedule cards and teaching tools.	As soon as Abdullah has the plastic study schedule cards in his hand and is walking to the teaching corner, he immediately puts them in his mouth, chews them, and then refuses to take them out. Similarly, he eats the books and other study aids that are placed in his corner.
Mohammad.	12.2	Refusing to sit in the learning corner.	When Mohammad is told to go to the teaching area, he immediately refuses to go there, pushes the teacher away with his hands while trying to escape from behind, flees quickly, climbs on the tables, and chairs, and jumps over them.
Matar	12.6	Clapping hands and hitting the feet on the ground at random.	Matar abruptly stands up from the teaching bench or from anywhere else in the classroom, begins irrationally clapping his hands loudly, then jumps to her feet and strikes the floor forcefully.
Abdullah. J	12.3	Cutting wires, ropes, and breaking class tools.	Abdullah immediately runs to the available wires and ropes in the classroom and begins cutting, removing, flapping, and playing with them while refusing to let go of them. Along with continuing to break the equipment in the classroom and corners

Table 1 above provides specific information about the students who participated in the single experimental group concerning their ages and determined behaviors. The youngest participant in the program is 11 years and 6 months old, and the oldest participant is twins, 12 years, and 8 months old, all the students fell within the age range of 8 to 14. In addition, the teacher's level of knowledge on functional behavior assessment was measured before the training sessions and the statistics for the two teachers on the test as below.

Table 2

FBA Test Descriptive Statistics pre-training

Phase	N	Minimum	Maximum	Mean	Std. Deviation
Pre-training	2	3	6	4.50	2.121

The teachers received a mean of 4.50, and the contestants' highest score was 6, while their lowest was 3. After one week of theoretical and practical training on functional behavior assessment methods, they start implementing the program with the students inside the classroom.

The two teachers gathered information about their students' behavioral problems and identified the problem as the highest priority. The teachers gathered FBA data and analyzed it with the researcher's help. After analyzing all the preceding data, a hypothesis statement on the function of the target behavior for each participant was developed. Based on the function of the target of the student's behaviors, this information was used to develop a behavior intervention plan for each participant.

The teachers in this study applied the strategies based on the principles of functional behavior assessment after explaining and presenting the training program to them. Table 3 shows below a simplified explanation about the strategies used and how were used with students.

Table 3

Used Strategies in the Intervention Phase

Students	Behavioral problem	Used Strategies
Abdullah.J	Cutting wires, ropes, and breaking class tools.	Controlling Antecedents: Remove the student's electrical cords and cover them. After finishing the exercises, place the training materials in a locked locker. Teaching positive/alternative behaviors: After completing the activities, the student is given tactile stimuli, which helps him learn positive behavior like gripping the wires safely and inserting them into the sockets.
Mohammad	Refusing to sit in the learning corner.	Controlling Antecedents: Training on the floor Going to the study seat while not holding a corner card. Teaching positive/alternative behavior: By exclusively associating sitting with the reinforcer, gradually lengthens the time spent in the chair.
Abdullah.k	Chewing/Eating the small plastic study schedule	Controlling Antecedents: Increase the size of the cards, and after the exercises are finished, store the training materials in a locked locker.

	cards and teaching tools.	Teaching positive/alternative behaviors Use tools to squeeze rubber and sponge, give the learner candy and gum, and give him physical and sensory exercises
Abdul-Aziz	Throwing of center and class chairs constantly.	Controlling Antecedents: relocating the morning student's entrance and lowering the number of chairs facing the student. Teaching positive/alternative behaviors: arranging chairs and reinforces him on it.
Matar	Clapping hands and hitting feet on the ground at random.	Controlling Antecedents: When training is complete, occupying the student with tools in his hand or an activity, and occasionally allowing the student to sit next to the teacher while he is occupied with another student. Teaching positive/alternative behaviors: By training him to clap and jump in a manner and at the proper moment, you can decrease the frequency of his haphazard clapping and jumping sessions.
Salem	Getting out of the seat during training.	Controlling Antecedents: Close the toilet door and, when operating in the training corner, provide water as a direct reinforcer. Teaching positive/alternative behaviors: playing with water, scrubbing it with a sponge, and filling cups with water from a jug.

Table 4

Means, Standard Deviations, and frequency of the single experimental group

Students	Frequencies		
Abdullah	28		
Mohammad	39		
Abdullah Ku	42		
Abdul-Aziz	47		
Matar	50		
Salem	64		

Group	N	Mean	Std. Deviation
Experimental	6	45.00	12.033

Table 4 above shows the means and frequencies of behaviors among students in the experimental group, based on the direct behavioral observation form applying to a specific behavior for each student, in the pre-intervention phase.

The Intervention Phase

After identifying the causes or functions and hypothesis of each behavioral problem, the two class teachers used the appropriate strategy for it according to the functional behavioral assessment with the continuation of record for the student's behavior for 5 weeks (5 days per week).

To answer the study's question: RQ1: Is there a significant difference in the behavioral problems scores among the severe autism spectrum disorder' students due to the functional behavior assessment strategies?

The teachers began the intervention program, the proposed program in this study (FBA) with the experimental group. During the three intervention phases, data was collected for the selected behaviors, as shown in the previous question (pre-intervention, intervention, and post-intervention).

Table 5 below shows the scores group' behaviors in the intervention phases. While table 6 shows the Paired Samples T-test, scores, and the students' means in the pre-post intervention phases.

Whereas figures 2 the behavior scores of the students during the intervention phases, and the quantitative data were analyzed inferentially using the SPSS 26 software, with the Paired Samples T-test.

Table 5

Students' Behavioral problems in intervention phases' frequencies

Students	Pre-Intervention	Intervention	Post-Intervention
Abdullah	28	5	2
Mohammad	39	9	5
Abdullah Ku	42	9	4
Abdul-Aziz	47	8	2
Matar	50	11	6
Salem	64	18	7
Duration	2 weeks	4 weeks	2 weeks

Table 6

Group Behavioral problems Pre-Post intervention Paired Samples T-test

Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)	
Pre-Post Intervention	40.667	10.614	4.333	29.527	51.806	9.385	5	.000

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
pre-intervention	45.00	6	12.033	4.913
post-intervention	4.33	6	2.066	.843

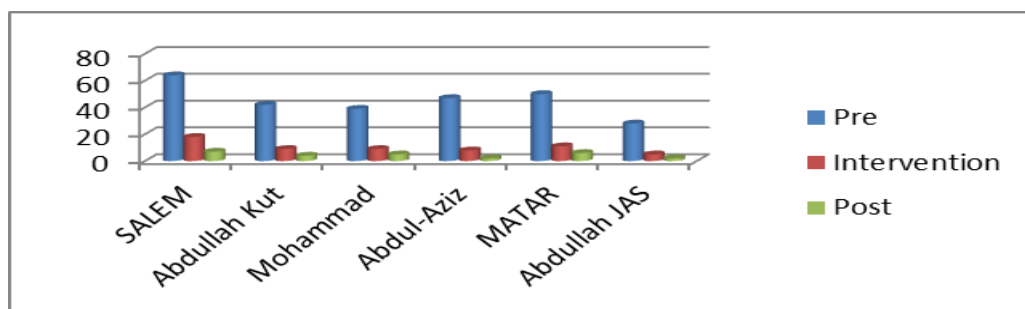


Figure 2 Behavior charts of the experimental group students

Testing of the Null Hypothesis

There is no significant difference in the behavioral problem score among the experimental group in the post-test due to the functional behavior assessment strategies. The post-test in table 6 shows a statistically significant difference ($= 0.05$) between the two means in the pre-intervention and the post-intervention scores for using the proposed program with lower ($M=4.33$) for scores of behavioral problems after the intervention, comparing with higher ($M=45.00$) for scores of behavioral problems before the intervention), with ($p=0.000$).

The null hypothesis is thus rejected, and the alternative hypothesis is accepted. This means that using the proposed program with the experimental group resulted in a greater and clearer reduction in the level of behavioral problems among the taking part students within the group. In order to respond to the study's question: RQ2: Is there a difference in knowledge of functional behavior assessment for teachers of severe autism spectrum disorder' students after implementation training sessions?

After the end of the training period and the application of the program in the classroom, the test was repeated, and the teachers' scores were extracted before and after training, and the results showed in table 7.

Table 7

Teachers FBA Knowledge Pre_ Post-test Statistics and Paired Samples T-test)

Phase	Mean	N	Std. Deviation
Pre-training	4.50	2	2.121
Post- training	12.00	2	1.41421

Paired Differences 95% Confidence Interval
Of the Difference

Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	
Pair1test - retest	-7.50000	.70711	.50000	-15.000	1	.042

Findings Summary

Through the illustrations and tables of frequencies, the disruptive behaviors of students with autism spectrum disorder and their behavioral problems, in general, need to use a behavior modification program that they face, whether it is a traditional program or a program based on the use of functional behavior assessment strategies, as it makes up a great burden on the teacher and leads to the failure of the process the daily educational difficulty and the difficulty of controlling the classroom.

The figures and frequencies and the paired sample test also showed that the results of the students in the single group are better through a decrease in their behavioral problems at post intervention than the pre intervention which can be attributed to the use of the functional and brief behavior assessment program using positive strategies in forming Alternative positive behavior, preventing negative stimuli from occurring or present and reinforcing opposite behaviors.

On other hand, it has been shown that functional behavior assessment strategies are effective in reducing behavioral problems. Indeed, knowing them and knowing how to use them is important for workers with autism spectrum disorder students in general. The results showed differences in the functional behavior assessment knowledge test of the two teachers participating in the experimental group in favor of the post-test, which supports the effectiveness of the training program in addition to the practical ability to apply strategies, which appeared in the decreased in the level of inappropriate behaviors.

Discussion

This current study examined the efficacy strategies of functional behavior assessment in reducing disruptive behavioral problems among sever ASD' students, in addition to know what the impact the training program on functional behavior assessment in increasing the teachers' knowledge.

The subject of evaluating functional behavior assessment and its use in the Arab region in general and the Gulf in particular, and specifically to students with autism spectrum disorder, has not taken its right to a large extent, so it is recommended to target researchers to study the subject in different environments and on the largest number of students as possible for the highest generalize ability of the results.

This study is limited to male students with severe autism spectrum disorder and targets classroom disruptive' behaviors. Also, the number of participants was limited, and the application was within one semester due to the difficulty of obtaining approval from the center in more than one semester, as well as the difficulty of the researcher following up on many students, teachers, and classes. Therefore, the study was limited to applying the strategies in one semester and two teachers.

Maharmeh et al. (2019) led a study that was pointed toward recognizing the degree to which FBA evaluation systems are successful in decreasing the degree of conduct issues; for instance, an example number of students with ASD and ADHD were distinguished government-funded schools and instructive focuses. The study will require recognizing the issues experienced by educators and proposing suggestions for defeating these troubles. The

study instrument included purposeful examples of four students: three boys and one female, who have been determined to have ASD and ADHD. To accomplish the reason for the review, the specialist utilized behavioral intervention Plans (BIP) as a tool and the FBA techniques to accomplish the objectives and purposes.

The qualitative data analysis using the BIPM method demonstrated the appropriateness and usefulness of the BIPM as a technique to handle students' behavioral problems in various educational contexts around the country. The recommendation was to replicate such a process and methodology throughout the country's school system.

Valdivia (2007) conducted a study to determine how many teachers feel that Positive Behavior Support (PBS) is an effective preventive behavioral technique in the classroom management of students with autism spectrum disorder. The information was gathered using questionnaires (Questionnaires) distributed to teachers at a center-based program for students with autism, as well as an Informed Consent Form. The findings acknowledge that positive behavior supports can help to develop issue behavior, reduce the usage of reduction-based techniques, and help to construct a functioning behavioral assessment and a behavior intervention plan. Participants also expressed strong agreement that PBS is usually sufficient, but that other forms of interventions, such as exclusion and seclusion time-out, may be necessary at times.

Machalicek et al. (2007) undertook a study to examine and assess studies on the management of problematic behavior in school settings for individuals with autism spectrum disorders (ASD). The research tools comprise computerized database searches conducted to locate studies published between 1995 and 2005. There were 26 studies found. Several approaches were utilized in this study to reduce disruptive conduct in the classroom. These approaches were classified into four categories: (a) antecedent manipulations, (b) modification in the instructional context, (c) differential reinforcement, and (d) self-management procedures. The findings revealed that all four groups of methods were frequently effective in lowering difficult behavior.

The results of current study which related to the first question in the line with the above studies in terms of the effectiveness of the techniques used and their usefulness in reducing behavioral problems among students. The current study differs in that it is specific and limited to students with autism spectrum disorder and severe degree only. However, previous studies included students with autism spectrum disorder of different degrees of severity in addition to categories others in the same study. With related to results of the second question, the findings of this question are in line with Ibigbami et al. (2021), Bernick (2019), Stewart (2009), which all informed to the importance and effectiveness of applying a training program to improve and develop teachers' knowledge of functional behavior assessment.

The effects of functional behavior assessment training program on the skills and knowledge of special education instructors were investigated by Ibigbami et al. in 2021. The researcher applied the training in intervention and control groups' teachers, and at baseline both of groups had "No Awareness" of FBA at the outset. By the conclusion of the intervention, however, 70% of the intervention group's teachers were judged to have an

excellent understanding of FBA, while none of the teachers in the control group received this rating.

The objective of Bernick's (2019) training was to instruct teachers at the Center for Students with Severe Behavioral Disorders in functional behavior assessment, help them create behavioral intervention plans, and assess how well the training increased their understanding of and ability to apply the program's material. FBA experience was on average 3.9 prior to training, while BIP experience was on average 4.7. The average FBA experience after training was 7.75, but the average BIP experience was 7.65.

The results of the present study showed great effectiveness of using functional behavior assessment strategies with students, especially as they targeted severe cases of people with autism spectrum disorder, so they can succeed to a greater degree with less severe cases, and here we recommend more training and introduction to special education teachers working in schools and centers on the mechanisms of functional behavior assessment and the use of models presented in this study to treat behavioral problems, that the training program applied in this study was effective.

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