A Multiple Regression Analysis on the Relationship among Students' Challenging Behaviors, Teacher Training, and the use of Aversive Behavioral Management Techniques

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ABSTRACT

This study used a multiple regression analysis to determine if there was a significance between the existence and intensity of student maladaptive behaviors, number of hours of teacher trainings in proactive and preventative behavior management techniques, and the number of instances a student is exposed to aversive techniques. The general problem addressed by this study was the use of aversive behavioral management techniques when students displayed challenging behaviors in the special education classroom due to teachers' reported feelings of being underprepared in classroom management. Aversive behavioral management techniques include restraints and seclusion practices and are to be used when a student is in imminent danger of painful themselves or people around them. This study was inspired by the work of B. F. Skinner who theorized eliminating condition response through positive reinforcement. The purpose of this study was to determine if positive and proactive behavior management techniques can reduce maladaptive behaviors. An electronic questionnaire was sent to all special education teachers in the lower section of New York City who taught in District 75, the special education district. Teachers were asked to identify if a student with a current behavior intervention plan or behavioral management plan exhibited 38 different behaviors and the intensity of those behaviors, identify the number of proactive and preventative behavior management trainings they attended in the last two years and how often the indicated student was exposed to aversive behavioral management techniques. The results showed the number of hours of teacher training on proactive and preventative behavior interventions, and the intensity of a child's challenging behaviors significantly predicted the number of instances aversive behavioral management techniques are used in the special education classroom. If positive and proactive teacher trainings helped to reduce the existence and intensity of maladaptive behaviors, it is believed the instances of aversive behavior management techniques would also reduce. The findings of this study will help lead a discussion on the need for teacher trainings on proactive and preventative behavior management techniques.

Keywords: Aversive behavioral management techniques; Preventative behavior management techniques; Office of civil rights.

INTRODUCTION

Students with disabilities are disproportionately exposed to the use of aversive behavioral management techniques, such as physical restraints and seclusions, than their nondisabled peers [1]. The use of the aversive behavioral management techniques is primarily used as a form of behavior management, particularly in the event of the engagement in challenging or harmful behavior

to the student's self, the classroom teacher, or peers [2]. The use of such techniques is intended for emergency situations, when student behaviors pose an imminent threat to them self, school personnel, or peers, but there is an increasing fear that the implementation of aversive behavioral management techniques are used as punishment and retaliation for non-compliance [3]. The misuse of the aversive behavioral management techniques may lead to implications of abuse and call for alternative measures to reduce the use of the aversive behavioral management techniques in the special education classroom [4].

Butler found students have been injured and traumatized by being restrained and 20 students have died due to restraints. This study used data collected from reports of physical restraints from 51 states, including the District of Columbia, for the first six months of 2019. Through this study, restraints and seclusions have been identified as being harmful to students. The use of the aversive behavioral management techniques may pose a danger to the individual or individuals restraining the child [2]. By avoiding the use of aversive behavioral management techniques, injury may be avoided for both student and school personnel.

There are laws providing protections against restraint and seclusion practices in 35 states. Out of those 35 states, 29 states provide laws stating that aversive behavioral management techniques are only to be used in emergency situations [5]. Parents and guardians of students with disabilities who have been subjected to the misuse or overuse of aversive behavioral management techniques may find legal assistance against the principals and district leaders. In 2001, the 3rd Circuit Court of the United States of America provided principals and district leaders with a four step test to examine if the use of any aversive behavioral management technique may be deemed as abusive through overuse and misuse. The court ruled there is a narrow difference between restraining a child for their safety and abusing a child. The four step test provided to principals was to ensure restraints being done in the school were for safety and did not pass the boundary of becoming abusive [5]. Protections are beginning to be put in place to protect students with disabilities from being harmed in the classroom due to being restrained or secluded [6-12].

As of 2020, there was no documentation on how many schools train teachers and school staff on preventative and proactive behavior management interventions. According to the U.S.A Department of Education's Office of Civil Rights (OCR, 2020), for the 2015-2016 school year, in the United States of America, 12% of students were serviced under the Individuals with Disabilities Education Act [7]. Out of the 124,000 students restrained or secluded during that school year, 71% of those students restrained were serviced under IDEA and 66% of the students secluded were serviced under IDEA (United Stated Department of Education, 2018). The reports do not indicate the severity or nature of the situation, how many times each child was restrained or secluded, or if steps were taken to deescalate each situation. This raises the question if the use of the aversive behavioral management techniques may have been avoidable.

Through the use of preventative and proactive behavior interventions and supports, classroom teachers, paraprofessionals, and school personnel may have the ability to deescalate challenging and problem behaviors before emergency actions, like restraints and seclusions, are needed. It may be necessary to avoid the use of restraints and seclusions to avoid physical and psychological harm found the use of proactive and preventative positive behavior supports in the classroom resulted in an increase in appropriate behavior, a decrease in inappropriate behavior, and an improvement in academic outcomes. Teachers, paraprofessionals, and school personnel may need to be trained on how to appropriately use proactive and preventative positive behavior supports in the classroom [8].

A way to ensure proper use of preventative and proactive behavior interventions in the special education classroom is through the participation in professional developments and training sessions for school personnel. A study conducted by Lewis et al., found the training and coaching of teaching staff on the proper implementation of preventative behavior was successful in decreasing total disruptive behaviors and negative social interactions and increased reading fluency. Some teachers benefit from training on how to simply approach a challenging situation. By changing the approach from criticism to care, students may be more willing to work with the teacher in deescalating the behaviors [9].

Trainings may provide teachers with the skills necessary to deescalate challenging behaviors before they turn into emergency situations. The evidence found in Simonsen et al [10], cause interest in the use of proactive and preventative behavior management intervention in special education classrooms. The deescalation of challenging behaviors may be the first step to avoiding the use of aversive behavioral management techniques on students. Protection for students against the aversive behavioral management techniques have been established in 35 states, but these protections may not be followed through in all classrooms. Teachers and other school staff may need to be trained on how to properly enforce preventative and proactive measures [5].

Studies have shown the use of preventative and proactive behavior interventions to be effective in reducing the instances of challenging and problematic behaviors in the special education classroom [8]. Studies also express the dangers of the use of aversive behavioral management techniques, such as restraints and seclusion practices [2,9,10]. This study focused on preventative and proactive interventions as an alternative to aversive behavioral management techniques. Students may not need to be restrained if the challenging behavior does not escalate to an emergency situation. Research was conducted to determine if the avoidance of emergency situations through trained preventative measures decreased the need for aversive behavioral management techniques.

Statement of the problem

The general problem addressed by this study was the use of aversive behavioral management techniques when students displayed challenging behaviors in the special education classroom due to teachers' reported feelings of being underprepared in classroom management. When teachers resort

to the use of restraints or seclusion practices as the first form of behavior intervention, due to a lack of teacher training, psychological or physical injuries can occur [11]. A disproportionate number of students with disabilities are restrained each year due to challenging behaviors in the classroom which may lead to complications, such as injury or death [12]. In a study conducted by the Council for Children with Behavioral Disorders, there have been about 31 students die as a result of restraints in the classroom from the years of 2003 to 2017. The use of aversive behavioral management techniques, which are intended for emergency situations only, has become an initial reaction to maladaptive behaviors because of a lack of teacher training even after the use of restraints and seclusions have been found to cause physical and psychological harm, such as traumatization [9].

Purpose of the study

The purpose of this quantitative correlational design with multiple regression analysis was to determine if the number of hours of teacher training in preventative and proactive interventions, and the intensity of a student's challenging behavior had an effect on the use of restraint and seclusion practices being used in the special education classroom. This study utilized the Sutter-Eyberg Student Behavior Inventory-revised which is designed to measure student behavior intensity for students up to the age of 16. Teachers completed the Sutter-Eyberg Student Behavior Inventory-revised (SESBI-r) for two students who had an active Behavior Intervention Plan in place [13]. No identifying information was asked for any teacher or student. Teachers were asked to complete material for two students to ensure the desired sample size was met. Through a g*power analysis for a multiple regression, 74 participants were needed to maintain a power of 0.95 for three predictor variables.

This study sampled middle and high school teachers of students from the age of 11 to 16 in a special education district in New York City that had an active Behavior Intervention Plan. Special education teachers of students with developmental disabilities from different schools within the special education district of New York were asked to complete the SESBI-r. In New York City, school districts are configured by location. Within each district, a special education district is formed. These districts educate students who are alternately assessed, separate from the New York State ELA and Mathematics assessments. Special education districts require students to have an IEP with a classification of autism spectrum disorder, intellectual disability, emotional disturbance, or an orthopedic impairment. This district services around 24,300 students, aged 2 to 21, and has around 4,800 teachers (New York City Department of Education, 2021).

Along with the SESBI-r, teachers were asked to identify how many hours of preventative and proactive behavior intervention training that teacher received within the previous two years. The teachers were then asked to complete a six-point Likert scale on how often that teacher restrained or secluded the indicated student. The Likert scale indicates 0-never, 1-once a month or

less, 2-once a week or less, 3-two to three times a week, 4-daily, 5-two or more times a day. Both the Likert-scale and the indication of training hours were sent to the individual teachers through an electronic questionnaire. Electronic materials will be sent to district leaders first to then be distributed to classroom teachers. This sample was voluntary among special education teachers.

Research question

RQ1: To what extent, if any, does the number of hours of teacher training on proactive and preventative behavior interventions, and the existence and intensity of a child's challenging behaviors predict the number of instances aversive behavioral management techniques are used in the special education classroom?

Hypotheses

H10: The number of hours of teacher training on proactive and preventative behavior interventions, and the existence and intensity of a child's challenging behaviors does not significantly predict the number of instances aversive behavioral management techniques are used in the special education classroom.

H1a: The number of hours of teacher training on proactive and preventative behavior interventions, and the existence and intensity of a child's challenging behaviors significantly predicts the number of instances aversive behavioral management techniques are used in the special education classroom.

Significance of the study

The general problem addressed by this study was how aversive behavioral management techniques are used by special education teachers as a form of behavior intervention because of a lack of teacher training in preventative and proactive behavior interventions [4,11]. Aversive behavioral management techniques, such as restraints and seclusion practices, have been found to cause injury to students and in severe cases, death [12,14]. A lack of teacher training in behavior interventions has contributed to teachers' fight or flight instinct to take effect when placed in an emergency situation [12].

This study may benefit school personnel and students in the special education classroom. Through this study, the effects between the amount of teacher training in preventative and proactive behavior interventions, the intensity of a student's challenging behaviors, and the use of aversive behavioral management techniques will be determined. This study may identify if teacher trainings have an effect on the number of instances a student is restrained or secluded. This may be a first step in identify alternative measures to take in the classroom to avoid the restraint or seclusion of a students.

The use of restraints have been found to be harmful to students in classrooms and have been deemed as abusive if done inappropriately [5]. These measures may be avoided if a relationship is found between teacher training and the use of aversive behavioral management techniques. If less restraints

and seclusions are used in the classroom, abuse of a child by a teacher or other school personnel may be avoided.

THEORETICAL FRAMEWORK

This study follows the theoretical work of B.F. Skinner's operant conditioning, first introduced in 1953. This theory outlined behavior management as the elimination of the conditioned response to an emotion through reinforcements [15]. Skinner based his research on Thorndike's law of effect and Watson's classical conditioning. Thorndike's law of effect stated any behavior that was immediately followed by a pleasant action was more likely to be repeated and any behavior that was immediately followed by an unpleasant action was less likely to be repeated. Thorndike's research used an apparatus, the puzzle box, to document hungry cats' behaviors when given food for opening a latch. The study, which resulted in Thorndike's law of effect, concluded the cats would open the latch quicker and quicker each time they were locked in the box because of the learned behavior of obtaining the food, which was considered the pleasant action [16].

Skinner believed introducing reinforcements before a behavior started would shape and change the participant's reaction. Skinner's theory of operant conditioning used Thorndike's law of effect but modified it to introduce reinforcers. Skinner believed any behavior that was reinforced will be repeated. Based on Watson's theory of classical conditioning, any behavior that was not reinforced will become extinct. By not reacting to a challenging behavior, that behavior would become extinct [15].

Within the field of education, operant conditioning has evolved into applied behavior analysis [17]. Using Skinner's theory of operant condition, Applied Behavior Analysis (ABA) analyzes and modifies human behaviors through the use of proactive and positive reinforcements. Applied behavior analysis allows school personnel to asses and treat challenging behaviors by introducing basic behavior principles outlined by Skinner's operant conditioning through systemic assessment and instructional procedures [18]. Positive behavior modification in the classroom through applied behavior analysis has been widely studied, leading to its use for the early intervention for individuals with autism spectrum disorder [18]. Baer et al., believed behaviors can be manipulated through positive reinforcements and a change in environment.

Applied behavior analysis allows school personnel to intervene on student behaviors before those behaviors put the student and those around them in imminent danger. Before school personnel are able to intervene, a Functional Behavior Assessment (FBA) is conducted to determine the function of the behavior displayed [19,20]. According to Iwata et al., there are four functions to all behaviors. Those functions include sensory, escape, attention, or tangible. As stated by Ala'i-Rosales et al., a sensory driven behavior includes reactions to stress, sounds, or touches. An escape driven behavior is displayed to avoid situations or actions. Behaviors driven by attention are done to gain focus on that individual. Lastly, Ala'i-Rosales et al. explains how tangible behaviors are done to gain access to objects desired by the individual [21].

By identifying the cause of the behavior, school personnel have the ability to intervene with positive behavior supports designed for the function of the behavior. Through training on how to identify behaviors and how to intervene with proactive and positive behavior intervention supports, school personnel are equipped to manage student behaviors. This skill set is connected to Skinner's original theory of operant conditioning by using positive reinforcement to manage an individual's behaviors. Teachers and other school staff are able to identify a behavior, determine an alternate behavior, identify an effective reinforce for the individual student, and begin the intervention by using the reinforcer to strengthen the engagement of the alternate behavior. Much like the rat in Skinner's box, when the student performs the desired alternate behavior, the student would be rewarded with the positive reinforcer. This reinforcer is used to strengthen the engagement of the alternate behavior, increasing the likelihood of repeating that behavior. The challenging behavior is replaced by the reinforced alternate behavior.

METHODOLOGY

This is a quantitative correlational design with multiple regression analysis. This study utilized three predictor variables to examine one criterion variable. The predictor variables consisted of the number of hours teachers have completed in proactive and preventative behavior management trainings, and T-scores derived from the SESBI-r's existence of student behavior and intensity of student behavior variables. The criterion variable was the number of instances an indicated student was subjected to aversive behavioral management techniques, such as restraint and seclusion practices.

A quantitative approach was appropriate for the described research to determine the statistical significance the three predictor variables have on the criterion variables. Quantitative research is used to generalize results for broader populations. Quantitative results are used to initiate generalized practices and future research through replication [19]. The research will be used to determine if the number of aversive behavior management techniques used in a special education classroom are predicted by the number of hours a teacher is trained on proactive and preventative behavior management techniques and the existence and intensity of a students' behavior. Qualitative research is not generalizable. The research was intended to be used as a first step in analyzing the existence and alternatives to aversive behavior management techniques in the classroom.

Prior to the multiple regression analysis, the SESBI-r scores were first converted into T-scores. The intensity scale of the SESBI-r is a 7-point Likert scale while the existence questionnaire is nominal data in the form of "Yes" and "No". A T-score provides a numerical representation for a difference between sample means in one population. It is used to compare the means of the two samples [20]. T-scores were used to standardize the survey results of the two sections of the SESBI-r. The two sections were the existence of the problem behaviors and the intensity of the problem behaviors. The population mean and standard deviation are unknown for the test given [22].

A multiple regression analysis was appropriate for this study due to the existence of three variables: three predictor variables and one criterion variable. Multiple regressions analyze the direct effect multiple variables have on a response and describes the effects each variable has on the other [23]. This study was used to determine if the number of teacher training hours on proactive and preventative behavior management and the T-scores from the SESBI-r predicted the existence of instances a student was restrained or secluded in the special education classroom.

With the use of SPSS, a multiple regression analysis was conducted. The number of teacher training hours and the T-scores from the SESBI-r were used as independent variables and the number of aversive behavior management techniques were used as the dependent variable. The use of SPSS provided coefficients to be analyzed to determine if the independent variables predicted the dependent variables. Through a g*power analysis for a multiple regression analysis, there was a need for 74 participants to maintain a power of .95 for three predictor variables. The study relied on the number of teachers participating.

The methodology and design is most appropriate because of the use of three variables. An experiment to determine if proactive and preventative behavior interventions decrease the occurrence of challenging and maladaptive behaviors has been considered, but the potential harm to the control group may hinder learning and cause physical or psychological harm due to a lack of intervention. An experiment would require a control and experiment group. The experiment group would receive appropriate intervention for challenging maladaptive behaviors. The control group would not receive appropriate interventions for challenging and maladaptive behaviors. Not intervening on challenging and maladaptive behaviors leave the student with the opportunity to harm themselves or others around them [24].

Population and sample

The Southern special education district of New York City services 24,300 students, aged 2 to 21, under IDEA. There are around 4,800 certified teachers servicing those students. A recruitment email was sent to the superintendent of this district and sent to all teachers of this district. This study relied on the participation of teachers. All materials was sent electronically and no identifying information was recorded. It was specified to all participants that the completion of the SESBI-r and the electronic questionnaire can be completed in five to eight minutes. The SESBI-r, the teacher-training questionnaire, and the aversive behavioral management Likert-scale were sent through one electronic questionnaire. The SESBI-r is a copyrighted assessment that is purchased by the researcher. The electronic questionnaire links were sent in an e-mail. Once the participant agreed to the consent letter, they were granted access to the entire questionnaire. The data from the electronic questionnaire were received automatically.

Students with special needs display challenging behaviors more often than those students without special needs, therefore, special education teachers will experience more maladaptive student behaviors. The special education district of New York

City is for those students whose academic and behavioral function cannot be maintained in the general education setting. Special education teachers are able to provide insight on the specific behaviors students engage in, how often they engage in the behaviors, and the severity of the behaviors. These teachers will often be able to provide relevant information on the use of restraint and seclusion practices used in the classroom [24].

The eligibility criteria was set for certified special education teachers in New York who teach in the southern special education district of New York City for at least two years. Teachers must have had at least one student with an active behavioral intervention plan. The students of the teacher must have be between the ages of 11 to 16 due to the age restraints of the SESBI-r. Through a g*power analysis for a multiple regression analysis for two predictor variables, there must have been a minimum of 74 participants to maintain a power of 0.95.

Materials

This study required the use of two forms of materials. The Sutter-Eyberg Student Behavior Inventory-revised was used to record the existence of a challenging behavior and the intensity of the challenging behavior among IDEA students. This test is designed for students between the ages of 11 to 16 [13]. The use of the SESBI-r is reliable and valid. Reliability was tested through test-retest, internal consistency, and inter-rater. For test-retest, Intensity (.81, n=52), Problem (.84, n=50), internal consistency, Intensity (.98), Problem (.93), and inter-rater, Intensity (range .43-.84, weighted mean=.68, n=72), Problem (range -.02-.22, weighted mean=-.04) (The National Child Traumatic Stress Network, 2020). Validity was tested through convergent/concurrent, discriminant, factorial validity, and predictive validity [25]. Before testing the hypotheses, four assumptions must be satisfied. Those assumptions are normality and linearity, homoscedasticity, multicollinearity, and independence of errors (Field, 2018). To test for reliability, Cronbach's alpha was used to assess the reliability and consistency of the questionnaires given to the teachers. To test multicollinearity, the variance inflation factor was identified through SPSS. The Variance Inflation Factor (VIF) is a quantity used to detect the presence of multicollinearity [26].

Along with the SESBI-r, teachers were asked to complete an electronic questionnaire. This questionnaire asked teachers to indicate how many hours of proactive and preventative behavior intervention training was completed in the last two years. The questionnaire then asked the teachers to indicate on a six-point Likert scale how often the student reviewed for the SESBI-r is subjected to restraint or seclusion practices. The scale indicated 0-never, 1-once a month or less, 2-once a week or less, 3-two to three times a week, 4-daily, 5-two or more times a day.

Participants were asked to complete both materials from a link in an email. The link given in the email will bring the participant to the online questionnaire where they were first asked to agree or disagree to a letter of consent. If the participant agreed to the terms of the study, they were brought to the questionnaire regarding number of hours of teacher training and the six-point Likert scale on the use of restraints and seclusions. After these questions are complete, the

participants were directed to a second page where they were asked to complete the SESBI-r.

Study procedures: Prior to the study, approval was obtained from Northcentral University's Institutional Review Board. After approval by NCU's IRB, an IRB proposal was sent to the New York City Department of Education IRB. Proposals were sent to an electronic platform along with documentation of approval from NCU [26, 27]. After approval, the study began with an e-mail to the superintendent of the special education district in New York City. This e-mail asked to be forwarded to school leaders and to classroom teachers of the special education district of New York City. A link to an online questionnaire was placed in the e-mail for the classroom teachers to click.

The link directed teachers to a consent form. Once agreed upon, the teachers were asked to complete a questionnaire. The questionnaire first asked teachers to select the number of hours of trainings they received on proactive and preventative behavior interventions from the last two years. Teachers had the option to choose from 0 to 20 hours. The next question was a six-point Likert scale asking the teachers to choose a student from their class that had an active BIP. This questionnaire, based on the chosen student, asked how often that student is subjected to the use of restraints or seclusion practices in the classroom. The scale indicated 1-once a month or less, 2-once a week or less, 3-two to three times a week, 4-daily, 5-two or more times a day.

Lastly, the teachers were asked to click on a next page button. This button directed the teachers to complete an SESBI-r for the chosen student. The SESBI-r had two parts. The first asked teachers to identify "Yes" or "No" to a list of 38 behaviors. The second part asked teachers to identify the intensity of each of the 38 behaviors on a 7-point Likert scale. Results were sent electronically to the researcher. Informed consent was obtained from all individual participants included in the study.

Once data was received, the two parts of the SESBI-r were converted into T-scores. The T-scores from the SESBI-r and the number of training hours were used as predictor variables for the use of restraints and seclusions in a multiple regression analysis. SPSS was the statistical software used for the data analysis.

RESULTS

Data analysis

When data was first received, the two variables of the SESBI-r were converted into T-scores to provide a numerical representation for a difference between the two sample means in one population. Each participant's SESBI-r results were given an existence T-score and an intensity T-score. To answer the research question, the T-scores of the existence and intensity of the student's behavior and the number of teacher training hours in proactive and preventative behavior interventions were used to identify the prediction of the use of aversive behavioral management techniques in the special education classroom. The T-scores and the number of hours of trainings were used as the predictor variables.

All data was placed into SPSS. A multiple regression analysis was done for the predictor variables of the existence and intensity of

student behaviors and number of hours of teacher training on the criterion variable of the use of aversive behavioral management techniques in the special education classroom. In SPSS, the use of aversive behavioral management techniques was identified as the dependent variable while the predictor variables were identified as the independent variables. After completing the multiple regression analysis, the significance of the coefficients were analyzed against each other. A multiple regression analysis was appropriate for this study to determine if three variables had an effect on each other and analyzed the direct effect multiple variables had on a response [22].

Validity and reliability of the data: This study required the use of the Sutter-Eyberg Student Behavior Inventory-revised which was used to record the existence of a challenging behavior and the intensity of the challenging behavior among IDEA students [24,25]. The use of the SESBI-r is reliable and valid for students between the ages of 11 to 16. Reliability was tested through test-retest, internal consistency, and inter-rater. For test-retest, Intensity (.81, n=52), Problem (.84, n=50), internal consistency, Intensity (.98), Problem (.93), and inter-rater, Intensity (range .43-.84, weighted mean=.68, n=72), Problem (range -.02-.22, weighted mean=.04) (The National Child Traumatic Stress Network, 2020). Validity was tested through convergent/concurrent, discriminant, factorial validity, and predictive validity [24].

To test for reliability, Cronbach's Alpha was used to assess the reliability and consistency of the questionnaires given to the teachers. To properly compute the data, the training variable first had to be reversed using the "calculate" option in SPSS. Once completed, the value for Cronbach's Alpha for the questionnaire was 7.= 6. Based on the results from this analysis, this test is deemed reliable because it approached+1 on a scale of 0 to +1 [27].

Before testing the hypotheses, four assumptions of multiple regression analysis must be satisfied. All missing values were included in calculating assumptions and results. Those assumptions were normality and linearity, homoscedasticity, multicollinearity, and independence of errors [28,29]. To test multicollinearity, the variance inflation factor was identified through SPSS. The Variance Inflation Factor (VIF) is a quantity used to detect the presence of multicollinearity [25].

To test for normality and linearity, a P-P plot was generated. The graph indicated the data were normal because it follows the normality line. Please see (Figure 1).
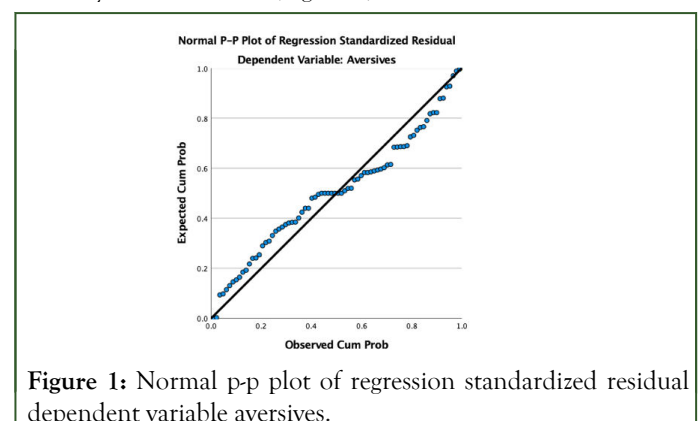
Figure 1: Normal p-p plot of regression standardized residual dependent variable aversives.

To test for homoscedasity, a scatterplot was generated. The data met the assumption of homoscedasity because the graph below shows no clear pattern to the data (Figure 2).
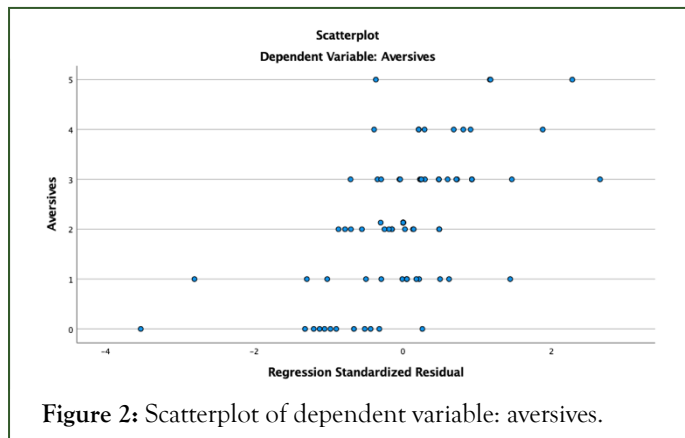

Figure 2: Scatterplot of dependent variable: aversives.

The assumption of multicollinearity was made for this statistical test. To prove the data met this assumption, the variance inflation factor was used for all three predictor variables. Multicollinearity was not a concern for the data set (Problem, Tolerance=.47, VIF=2.13; Intensity, Tolerance=.47, VIF=2.11; Training, Tolerance=.79, VIF=1.26). For all three variables, the collinearity tolerance was above .10 and VIF was below 10, indicating no multicollinearity concerns [30].

This quantitative study used a multiple regression analysis to determine if the number of hours teachers were trained in preventative and proactive behavior management techniques and the existence and intensity of student maladaptive behaviors had an effect on the number of times a student was exposed to aversive behavior management techniques like restraints and seclusion practices. The online questionnaire was emailed to special education teachers in District 75, a special education district in the lower section of New York City. To maintain a g*power of .95, 74 participants were needed, 76 results were gathered, 60 results were used, and 16 of the results were incomplete. The number of responses that were used was less than the required amount necessary to maintain a g*power of . 95. This limitation will result in reduced statistical power and introduces the risk of type II error. Type II error indicates a false negative, often an error of omission. The error of omission causes the data of a linear regression to be less predictable [31].

Research question/hypothesis

Based on the multiple regression analysis performed in SPSS, the model explained 65.9% of the variance. The ANOVA results show the relationship between the predictor variables: existence of challenging behavior, intensity of challenging behavior, and the number of hours teachers have attended training on proactive and preventative behavior management techniques, and the use of aversive behavior management techniques in the special education classroom, $F(3,65)=41.85$, $p<.001$ (Table 1).

Each individual predictor variable was given its own significance against the criterion variable, the Existence of the Problem Behavior ($B=.01$, $p=.70$), the Intensity of the Problem Behavior ($B=.16$, $p<.001$), and the Number of Training Hours ($B=-.10$, $p=. 07$). These results were analyzed against the hypothesis to determine the significance of the results. Based on the results, the intensity of the problem behavior was the only variable that was statistically significant ($B=.16$, $p<.001$). Both, the existence of the problem behavior and the number of training hours attended had a $p>.05$, meaning these variables were not significant in predicting the use of aversive behavioral management techniques (Table 2).

Table 1: ANOVAa-The ANOVA results show the relationship between the predictor variables.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	96.069	3	32.023	41.847	<.001b
Residual	49.740	65	0.765		
Total	145.809	68			

Note: a-Dependent Variable: Aversives; b-Predictors: (Constant), 15-Training, IntT, ProbT.

Table 2: Coefficients a-Each individual predictor variable was given its own significance against the criterion variable.

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-6.622	1.251		-5.295	<.001		
ProbT	0.008	0.021	0.042	0.393	.695	.468	2.136
IntT	0.155	0.023	0.707	6.720	<.001	.474	2.111
15-Training	-0.103	0.056	-0.148	-1.820	.073	.791	1.264

Note: a Dependent variable: aversives.

Based on the results of the multiple regression analysis, the null hypothesis cannot be rejected. With $F_{(3,65)}=41.85$, $p<.001$, the data may appear to be statistically significant. When $p<.001$, the finding show a value less than $p=.05$, indicating the alternate hypothesis is accepted, but the number of hours of teacher training on proactive and preventative behavior interventions, and the existence of a child's challenging behaviors does not significantly predict the number of instances aversive behavioral management techniques are used in the special education classroom because individually, each $p>.05$.

Evaluation of the findings: This quantitative correlational study used a multiple regression analysis to determine if the number of teacher training hours on proactive and preventative behavior management supports and the existence and intensity of various behaviors had a significant impact on the instances of aversive behavior management techniques used in the special education classroom. This study was modeled after B.F. Skinner's theory of operant conditioning. Skinner believed positive reinforcements could be introduced to shape and manipulate a person's responses to various situations.

The findings of this study indicated the number of training hours teachers completed could not predict the number of instances a student was subjected to aversive behavior management techniques. These findings do not align with Sinner's theory of operant conditioning in that trainings in positive reinforcement and behavior management techniques were not successful in reducing maladaptive behaviors in the special education classroom. The misalignment of the data may be caused by low statistical power. This is due to a small sample size. This warrants the study to be repeated with a larger sample size for more accurate results.

By failing to reject the null hypothesis, together, the number of hours in proactive and preventative behavior management trainings and the existence and intensity of a student's behavior cannot significantly predict the number of instances aversive behavior management techniques are used in a special education classroom. This outcome shows the impact the intensity of a student's challenging behavior has on the number of instances that child is exposed to aversive behavior management techniques, $p<.001$. This means the more intense a student's challenging behavior is, the more likely aversive behavior management techniques, like restraints and seclusion practices, will be used on the student.

The findings of this study do not directly align with past research. This study found the hours of training in proactive and preventative behavior management techniques does not have a statistical significance on the number of instances a student is subjected to aversive behavioral management techniques. A study conducted by Briggs et al. found positive reinforcements of alternative behaviors reduced the engagement of maladaptive behaviors in the special education classroom. Similarly, Newcomb et al. concluded positive reinforcements reduced the engagement of physically aggressive behaviors in students by 82%. The current study cannot conclude the same results [32, 33].

LIMITATIONS

Limitations to be considered are the number of completed responses, the integrity of the responses collected, and the lack of responses needed to maintain a g*power of .95 causing a low statistical power. The study obtained 76 responses, but only 60 were complete. Incomplete responses made it challenging to receive a clear view on the data. This study also relied on the integrity of the responses received from each teacher. This study may be considered as sensitive because of the discussion of aversive techniques in the classroom. Teachers were expected to respond honestly about their experiences with restraint and seclusion practices regarding specific students with a behavior management plan or behavior intervention plan. Teachers were assured all responses were anonymous, no email addresses or IP addresses were collected with the submission of each response.

Other limitations to be considered is the location of where the electronic questionnaire was given. This study focused on students in ta subsection of the New York City Department of Education. No data were collected on students in the general education system. Aversive techniques are used in various settings across New York City, but it is unclear of how many trainings teachers received on behavior management techniques while in the general education setting.

Lastly, a major limitation is the lack of responses to maintain a g*power of .95, the findings resulted in reduced statistical power. Low statistical power is problematic for quantitative research studies as it often causes an error and leaves the findings inconclusive [33]. This also introduced the risk to a type II error. This error is also known as the error of omission. This results in a false negative result where the null hypothesis should be rejected but the predictor variables are deemed as not statistically significant. A false negative results causes the investigator to fail to reject the null hypotheses [34]. It is recommended to repeat the study with a larger sample size to obtain the most accurate results.

This chapter will be used to discuss the implications of the results found in this study and recommendations for future research. The implications will consist of the statistical data found and how that data will influence the field of education. The recommendations for future research will outline necessary steps needed to support this data in different settings.

RECOMMENDATIONS

This quantitative study used a multiple regression analysis to determine if the existence of challenging behaviors, intensity of challenging behaviors, and the number of hours a teacher completed trainings on proactive and preventative behavior management techniques could predict the number of instances a student was subjected to aversive behavior management techniques. Students exhibit challenging behaviors in the classroom which may lead to behavior interventions, but a lack of teacher training in behavior interventions has contributed to teachers' fight or flight instinct to take effect when placed in an emergency situation [11]. The intent of this study was to determine if more teacher trainings could reduce the need for

aversive behavior management techniques when challenging behaviors arise.

This study found the predictor variables, together, showed the data was statistically significant to reject the null hypothesis, $F_{(3,65)}=41.85$, $p<.001$, indicating the predictor variables had an effect on the criterion variable. Individually, the existence of the challenging behavior, $(B=.01, p=.70)$, and the number of training hours, $(B=-.10, p=.07)$, were not statistically significant with $p>.05$. This indicated the failure to reject the null hypothesis.

The results of the study imply the intensity of a student's behavior predicts how often that student is exposed to aversive techniques, but the use of teachers' proactive and preventative behavior management techniques did not reduce the use of these techniques. This does not specifically align with B.F. Skinner's theory of operant conditioning. Skinner found positive reinforcement shaped and manipulated behavior to reduce undesired actions. If this study aligned with Skinner's theory, the null hypothesis would be rejected because the use of positive and proactive behavior management techniques would have reduced the number of instances a student was exposed to aversive behavior management techniques. The findings of this study does not support this. This leaves a gap in the field of education on best practices to be used to reduce student challenging behaviors. This study only proves more research, with ample participation, must be done to identify significant behavior management techniques to be used in the classroom. This may also lead to the implication of a need for different forms of behavior management techniques for managing more challenging behaviors.

Due to the low statistical power from the lack of complete responses, this study was introduced to a type II error, causing the rejection of the null hypothesis [35]. Despite this, the data did indicate the predictor variables had an effect on the criterion variable. This may imply, together, the more training a teacher had in proactive and preventative behavior management techniques, the less intense challenging behaviors a student exhibited, therefore reducing the need for aversive behavioral management techniques. Based on these results, trainings on proactive and preventative behavioral management techniques may be successful in reducing the intensity of students' challenging behaviors, therefore should be promoted in schools and districts, but it cannot be said trainings will directly reduce the use of aversive behavioral management techniques.

Individually, the only variable that had an effect on the use of aversive techniques was the intensity of the student behaviors. This is consistent with the findings of Scheuermann et al. where teachers' fight or flight instincts are used in challenging situations. This indicates the more intense a student's behavior became, the more likely that student was exposed to aversive behavioral management techniques. The existence of the behavior was not enough to indicate the use of the aversive behavioral management techniques. Likewise, the number of hours a teacher attended training in proactive and preventative behavioral management techniques could not predict the use of aversive behavioral management techniques on its own.

All variables together had an effect on the use of aversive techniques indicating the teacher training reduced the intensity and existence of student challenging behavior, therefore reducing the use of aversive behavioral management techniques. This indicates the need for training in proactive and preventative behavioral management techniques to reduce the existence and intensity of a student's challenging behavior. The reduction in the challenging behavior reduces the need for aversive behavioral management needs. Simply having teachers trained in proactive and preventative behavioral management needs alone will not reduce the use of restraints and seclusion practices. The trainings must be put into use in the classroom to first reduce the challenging behaviors.

It is necessary to remember the type II error introduced in this study and the failure to reject the null hypothesis. The findings of this study cannot confirm the existence of the challenging behavior and the number of trainings hours in proactive and preventative behavior management techniques have an effect on the number of instances a student is exposed to aversive behavior management techniques. This implies trainings in proactive and preventative behavior management techniques do not reduce the use of aversive behavioral management techniques when handling challenging behaviors, contrary to Skinner's theory of operant conditioning. A study conducted by Rafi et al. found the use of operant conditioning and praise reduced students' challenging behaviors and increased their participation in academic activities [36]. A desired outcome would be the effective use of trainings in reducing challenging behaviors to avoid the use of aversive behavior management techniques. The desired outcome would support the field of education by avoiding potentially dangerous practices and encouraging a safe environment for all students of various functioning levels to learn and grow.

Recommendations for practice

The findings of the current study suggest the only variable to predict the use of aversive behavioral management techniques was the intensity of the student's challenging behavior, but together, all three variables had an effect on the criterion variable. The data implies training in proactive and preventative behavior management techniques reduces the existence and intensity of the student's challenging behavior, which then reduces the use of aversive behavioral management techniques. Teacher trainings in proactive and preventative behavioral management techniques did not have a direct effect on the use of aversive behavioral management techniques, but by reducing the intensity of the challenging behaviors, educators can avoid the need for restraints and seclusions.

Based on these findings, in order to reduce the use of aversive behavioral management techniques, classroom teachers must first reduce the intensity of the students' challenging behaviors. To reduce the intensity of challenging behaviors, proactive and preventative behavioral management techniques are used to support appropriate behaviors [37]. Though the null hypothesis failed to be rejected due to a type II error, the results did show statistically significant results that should be used when planning professional developments for educators.

It is recommended teachers be trained on how to first identify student triggers and warning signs of the onset of a challenging behavior. By indicating possible triggers, teachers and school staff can better avoid certain objects, words, or sounds, within reason, to help give each student a better chance of success. It is also recommended teachers inform all classroom staff on the specific steps to be taken when working with each student. All students are different and have different wants and needs, but it is helpful to follow a routine and schedule that students can follow along with.

Teachers and classroom staff should be familiar with the first signs of a challenging behavior. By identifying the behavior early on, de-escalation steps may be taken before it turns into an imminent danger situation. De-escalation steps may not work at all times, but it is a proactive way of helping students without the use of aversive behavioral management techniques. Steps to de-escalate behaviors should always be consistent and planned out for each students' challenging behaviors. Training on practicing de-escalation techniques should be available for teachers and classroom staff.

It cannot be confirmed that positive and proactive behavioral management techniques will reduce the use of aversive behavioral management techniques, but it was statistically significant in reducing the intensity of the challenging behaviors. This is enough evidence to suggest training in proactive and preventative behavioral management techniques are useful in the special education classroom. Teachers are responsible for the well-being of all students in their classroom, this includes avoiding and deescalating challenging and maladaptive behaviors to maintain a safe environment for all students to foster learning and growth.

The needs of each district vary based on population size and demographic. It is recommended district leaders and principals explore the most appropriate options available to them. Trainings and professional developments on the use of positive and proactive behavioral management techniques should be offered to teachers and support staff frequently and often. This is to ensure staff is informed of the most recent techniques and are utilizing them appropriately. The trainings were effective in reducing the intensity of the students' challenging behaviors, but more research with a stronger statistical power should be done to determine the direct effect it has on the use of aversive behavioral management techniques.

Recommendations for future research

The current research was used to indicate if the existence of challenging behaviors, intensity of challenging behaviors, and the number of hours a teacher completed trainings on proactive and preventative behavior management techniques could predict the number of instances a student was subjected to aversive behavior management techniques. The findings do not support this claim, indicating the use of aversive behavior management techniques is independent of teacher training hours and the existence of challenging behaviors. The study did indicate the intensity of the challenging behavior to predict the use of aversive behavioral management techniques. High rates of intense challenging behaviors increase teacher stress, damage

student-teacher relationships, and increases teacher biases towards students, therefore increasing quick, harsh, and less-effective behavior management techniques [38].

This leaves unanswered questions that future research may conclude. Based on this study, proactive and preventative behavior management techniques do not directly reduce the use of aversive behavior management techniques. This is contrary to the findings of Skinner's theory of operant conditioning that was used as the frame work for the present study. Future research may be used to indicate the accuracy of the current findings.

This study had a low statistical power which introduces the results to a type II error, or a false negative effect. This limitation must be addressed in future research to produce more accurate findings. The result of this study may not portray accurate relationships among the predictor and criterion variables. For this study. Future researchers must ensure the appropriate number of participants are used to yield a high statistical power and reduce the chances of statistical errors. To maintain a g*power of .95, 74 participants were needed. Of the 76 responses, 60 were fully completed. The sample size needed was determined specifically for this study and will vary for different studies depending on study design and methodology [33].

This study may also have been limited to the effort of the participants as assessed by the short time taken to complete the online survey sent to teachers' emails. This study took approximately five to eight minutes to complete. The researcher trusts all participants took the appropriate time to read through each option and prompt to answer honestly rather than click through options to complete the questionnaire quickly. Of the 76 responses, 17 were completed in under four minutes.

Another limitation to be considered is the population. The current study only collected data from one district in New York City. This district is comprised of about 24,000 students while all of New York City's Department of Education has an enrollment of over 990,000 students. New York City is the largest school district in the United States. Data collected within this district does not reflect how schools in smaller school districts across The United States manage students. For a clearer understanding of behaviors and behavior management trends across The United States, research should be conducted in smaller districts, ones that reflect the same policies and structures of the majority of school districts across America.

This topic is in great need for development as it relates to the safety of students and teachers while in the classroom. Aversive behavior management techniques, as outlined in the United States of America Department of Education Restraint and Seclusion: Resource Document, should only be used when there is an imminent threat to the student or teachers. Unfortunately, students who are restrained or secluded for nonviolent behaviors are faced with the misuse and excessive use of the aversive behavioral management techniques [39-49]. Teachers are expected to keep students safe while in their care. Tools are needed to help teachers reduce the need to resort to aversive behavior management techniques. A suggestion for future research may include the training of teachers on proactive and

preventative behavior management techniques and observing the teacher in their classroom. Data would be collected on student responses to the practiced intervention. This may give a more accurate understanding of the effect proactive and preventative behavior management techniques have on the use of aversive behavior management techniques. By completing observations, this will also indicate if the teacher is actually using the techniques taught in trainings appropriately.

CONCLUSION

The education system is faced with the general problem of aversive behavioral management techniques being used by special education teachers as a form of behavior intervention because of a lack of teacher training in preventative and proactive behavior interventions. These behavioral management techniques have been found to cause injury to students and in severe cases, death. Teachers are tasked with educating students on curriculum based materials, but also social and emotional skills while fostering a safe and supportive environment. While sometimes aversive behavioral management techniques may be the only way to remedy a situation of imminent danger, the potentially dangerous techniques are misused and overused in the special education classroom.

To help keep students safe while in school, other behavior management techniques should be used before restraint and seclusion practices. Skinner theorized the manipulation of behavior through positive reinforcement. This study sought to determine if positive and proactive behavior management techniques could be used in the special education classroom to manipulate challenging behaviors so aversive behavioral management techniques could be avoided. This study utilized an online questionnaire that measured the number of hours a teacher attended trainings on proactive and preventative behavior management techniques, the existence of a challenging behavior for a student in the special education classroom, and the intensity of that behavior against the number of instances the student was exposed to aversive behavior management techniques.

After a multiple regression analysis, the only predictor variable to have a statistical significance was the intensity of the challenging behavior. This indicates the more intense a student's behavior, the more likely aversive behavioral management techniques would be used. The existence of the challenging behavior and the number of hours of teacher training on proactive and preventative behavior management techniques did not have a statistical significance on the use of aversive behavioral management techniques. To maintain a g*power of . 95, 74 participants were needed, 76 responses were gathered, but only 60 responses were completed. The low statistical power caused the results to be deemed inconclusive. Due to a low number of complete responses, there was a low statistical power and the introduction of a type II error indicating a false negative.

The outcome of this study was inconclusive, but more research must be done on determining alternative behavior management techniques to be used in the special education classroom to avoid the use of restraints and seclusions. This study determined no significance between proactive and preventative behavior management techniques and the use of aversive behavioral management techniques, but there was low statistical power and a type II error. Every student, regardless of functioning level, deserves a safe environment to learn and grow as an individual. Therefore, more research is necessary in determining better teaching practices to be used in every classroom. Studies like Gueldner et al. and Thomas and Lafasakis show a significance in the use of positive reinforcements in the classroom. These studies should be used as models to determine how the positive reinforcements effect the use of aversive behavioral management techniques used in the classroom.

Students should not be restrained and secluded if not absolutely necessary, like in times of imminent danger. The desired result would have supported the findings of Skinner, indicating the use of proactive reinforcement to shape behaviors, thus avoiding the need for restraints. This would have benefitted the field of education by ensuring more students are safe in the classroom. Ideally, this study would have been used as a step towards the use of proactive behavior management techniques in everyday situations to help students understand alternative reactions. The results of this study highlights the need for more research in order to find better ways for teachers to deescalate situations of challenging student behaviors, thus ensuring a safe environment for all students.

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