

The Effect of Physical Activity
on
Maladaptive Behaviors in a Behavior Learning Support (BLS) Classroom

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Abstract

The purpose of this study was to determine if antecedent physical activity would impact the prevalence of maladaptive behaviors in a behavior support elementary classroom ($n = 6$). The measurement tool was a behavioral point sheet that provided behavioral scores for each participant in the study. This study used a pre-experimental design with a variant of a one-group pretest-posttest design to compare pre-intervention baseline data to post-intervention data. There was no significant difference in the Behavioral Score of students during the baseline period (Mean = 92.40, SD = 4.32) and during the intervention period (Mean = 91.24, SD = 5.42) [$t(5) = .61, p > .05$]. Researchers should continue to study the effects of antecedent physical activity as maladaptive behaviors become an increasing concern for classroom teachers.

CHAPTER I

INTRODUCTION

Overview

Behavior learning support (BLS) classrooms focus on students with maladaptive behaviors that cannot be included in general education classrooms. Students in BLS classrooms exhibit significant behavioral needs that inhibit learning environments and create educational concerns for classroom teachers. Disabilities prevalent in BLS classrooms are emotional and/or behavioral disorders (EBD), autism spectrum disorders (ASD), learning disabilities (LD), attention deficit hyperactivity disorder (ADHD), and/or conduct disorders (CD) (Scholte, Stoutjesdijk, & Swaab, 2012). It is not rare for students in this classroom to encompass more than one of these disabilities.

Maladaptive behaviors among students in BLS classrooms include physical or verbal aggression, non-compliance, disrespectful language, rule-breaking behaviors, off-task behaviors, not respecting the space or property of others, and/or hyperactivity/impulsivity (Muscott, 1997). The disruption to the educational process for other students and teachers leads to referrals to behavior support. Further, the prevalence of aggressive/violent behaviors with students in BLS classrooms leaves teachers feeling anxious about the unpredictable and unexpected nature of these students.

Physical activity is used as an effective intervention in the decreasing of maladaptive behaviors among students encompassing EBD and other disabilities (Canella-Malone, Kazee, & Tullis, 2011). Teachers using physical activity as an antecedent report students exhibiting positive engagement in the learning process, less work refusal, and an overall decrease in maladaptive behaviors within the BLS classroom. By utilizing physical activity, teachers of

students in behavioral classrooms see improvements in interpersonal relationships among students and increased time in the classroom for teachers to teach curriculum.

The purpose of this study is to test the effect of utilizing physical activity in a BLS classroom daily each morning. Students in BLS classrooms often exhibit maladaptive behaviors that require the need for temporary removal from classrooms. Due to maladaptive behaviors there is a lack of instruction which leads to increased frustration on the part of students. Students and teachers in these classrooms are expected to keep up with county-mandated curriculum. Maladaptive behaviors interfere with instruction and require some response. An intervention is needed to assist teachers in managing students' behaviors and maintaining a classroom environment where learning can take place.

Statement of Problem

The purpose of this study is to determine the impact of utilizing antecedent physical activity for ten minutes each morning on maladaptive behaviors.

Hypothesis

The null hypothesis is that there will be no difference in the behavioral score of students in an elementary BLS classroom during the baseline trial period and during the intervention period when antecedent physical activity is used for ten minutes each morning.

Operational Definitions

A *BLS classroom* refers to six students aged 9 to 12 that have been found eligible for special education services and have exhibited significant behavioral needs to warrant placement in a BLS classroom. These classrooms provide supports to students through small student to teacher ratios, access to therapeutic and crisis supports, social skills training, and a classroom wide behavior modification plan. *Behavioral point sheet* refers to a sheet that each student in the

BLS classroom carries throughout the day that documents his or her success in earning points in the following categories: safety, responsibility, and respect. Two points can be earned in each category during each subject area if the student does not exhibit maladaptive behaviors that would fall under that category. *Behavioral score* is the total of points students earned in the areas of safety, responsibility, and respect divided by the total number of points possible for the day. *Maladaptive behaviors* refer to behaviors that children exhibit in the classroom that interfere with their learning or the learning of other children such as physical or verbal aggression, non-compliance, disrespectful language, rule-breaking behaviors, off-task behaviors, not respecting the space or property of others, and/or hyperactivity/impulsivity that warrant loss of points on a behavioral point sheet in the areas of safety, responsibility, and respect. *Antecedent physical activity* refers to ten minutes of exercise from 9:30 to 9:40 am on Mondays, Wednesdays, Thursdays, and Fridays. Students follow along with a fitness video, which provides cardio exercise. *Decrease in the prevalence of maladaptive behaviors* refers to students showing improvement on point sheets developed by the observer in the area of safety, responsibility, and respect as compared to baseline data.

CHAPTER II

A REVIEW OF THE LITERATURE

This literature review addresses the concept of behavior in the elementary school classroom as it focuses on elementary students with emotional and behavioral disorders (EBD). Section one gives an overview of the maladaptive behaviors prevalent with students identified with EBD. Section two encompasses appropriate practices educators use when dealing with maladaptive behaviors. Section three discusses preventative measures to decrease the likelihood of students exhibiting maladaptive behaviors.

Maladaptive Behaviors among Students with EBD

Elementary students with emotional/behavioral disabilities (EBD) are the most likely students with disabilities to be educated in separate programs out of mainstream inclusion classrooms. There are four times as many students with EBD than other disabilities in residential facilities, special schools, and hospital placements due to the nature of these students' maladaptive behaviors (Muscott, 1997). The aggressive nature of the majority of students with EBD is the reason these students are considered the most challenging group of disabilities to have in a regular education classroom (Scholte et al., 2012).

According to Muscott (1997), aggression is the most common profile of students with EBD. Aggression includes violence (hitting, fighting, and verbal threats) and behaviors that threaten the authority of the teacher. Aggressive behaviors in general education classrooms leave teachers fearful of the unpredictable nature of students with EBD, thus leading to referrals to more restrictive placements (Scholte et al., 2012). Most students with EBD have not been able to be successfully educated in the general education classrooms.

Many children with EBD often also encompass other disabilities such as autism spectrum disorders (ASD), learning disabilities (LD), attention deficit hyperactivity disorder (ADHD), and conduct disorders (CD). The comorbidity of these disorders warrants difficulty in developmental areas such as social and academic abilities (Scholte et al., 2012). Maladaptive behaviors that occur as a result are “anxious/fearful behaviors, withdrawal/seclusion, rule-breaking behaviors, and hyperactivity” (Muscott, 1997, p. 3). The prevalence of these behaviors affects the classroom environment in a negative way, hindering students with EBD’s exposure to general education classrooms. Instruction suffers because attention to these students monopolizes instructional time and limits the teacher’s ability to move forward with curriculum. Further, the comorbidity of students’ disabilities leaves many teachers feeling unprepared to handle behaviors. Teachers feel a lack of understanding how to manage maladaptive behaviors. A sense of helplessness occurs and frustration leads to inappropriate dealings with behaviors.

Prevalent behaviors that are observed under the umbrella of anxious/fearful and withdrawal/seclusion behaviors are “self-doubt, lack of concentration, careless errors, not following directions, short attention span, perfection, and academic deficits” (Davis, Harrison, Reynolds, & Vannest, 2012, p. 60). Many students with EBD internalize behaviors making it difficult for them to perform in an academic or social setting. These anxious behaviors often lead to more explosive behaviors that warrant physical intervention and removal to behavior support. As a result, teachers feel more comfortable placing students with EBD in more restrictive placements. The maladaptive behaviors affect other students in the classroom, necessitating teachers to proactively intervene (Scholte et al., 2012).

Appropriate Practices of Dealing with Maladaptive Behaviors

Teachers handle maladaptive behaviors, largely in the delivery of instruction. According to Denny, Gunter, and Venn (2000), teachers modify instructional materials during academic instruction as a preventative measure to reduce maladaptive behaviors among students with EBD. Teachers also modify the pacing of instruction, reduce the number of items students are expected to learn in a given period, increase the level of support from personnel, allow for the use of technology to supplement instruction, decrease the difficulty of tasks, provide alternatives for answering questions, adapt the expectations for participation, and substitute aspects of the curriculum to adjust expectations. These instructional decisions limit opportunities for students with EBD to act out based on anxiety and academic frustration, a prevalent source of maladaptive behaviors.

As teachers instruct their students within classroom settings (whether they are enrolled in regular education or special programs), instruction is modified for the benefit of their students. Empirical evidence supports that modifying the curriculum by adjusting task difficulty, chunking workloads, incorporating student interest, and structuring academic tasks for elementary students with EBD shows benefit (Mooney, Pierce, & Ryan, 2008). Such instructional strategies limit students' maladaptive behaviors during instruction as the teacher has taken into account precipitating factors that lead to maladaptive behaviors. These practices increase the amount of instruction they are able to deliver and the level of understanding students with EBD are able to attain during lessons. Data support that differentiated instruction decreases the prevalence of aggressive behaviors, off-task behaviors, and behaviors disruptive to other students within the academic setting (Denny et al., 2000).

Providing opportunities for students to work together during academic instruction proves to be effective in intervening before maladaptive behaviors take place. Teachers that modify instruction by allowing opportunities for peer tutoring and cooperative learning are seeing value in the reduction of maladaptive behaviors (Mooney et al., 2008). Older students being matched with younger students allow for a sense of leadership and pride as the learning is shared. Students with EBD see less of a threat when they are working in cooperative groups giving each child responsibility for different aspects of learning. Teachers that allow opportunities for peer reinforcement, peer modeling, and peer-assisted learning strategies also see a decrease in maladaptive behaviors. A commonality among students with EBD is they most often express a desire to take leadership roles and be in charge of their own learning (Denny et al., 2000). Mooney et al. (2008) also state that when elementary students with EBD are provided opportunities to self-monitor their behavior during instruction, positive results are seen. Students with EBD respond well to chances allowing them to monitor behavioral choices. As students are responsible for providing academic instruction themselves, maladaptive behaviors decrease. The strength of these modifications is impressive because students with EBD thrive with leadership and self-monitoring opportunities during instruction. Even with these leadership opportunities, and before instruction begins, teachers have preventative measures that also seek to prevent maladaptive behaviors allowing instruction to run smoothly.

Preventative Measures to Decrease Likelihood of Maladaptive Behaviors

Teachers of students with EBD focus attention on thoughtful, sustained, systematic ways for children to handle social and emotional experiences that otherwise hinder their exposure to learning both socially and academically. This attention promotes primary prevention, which encompasses interventions reducing potentially harmful circumstances before they result in the

poor decisions (Elias & Weissberg, 2000). This technique gives students tools necessary to respond to difficult social situations in thoughtful, responsible, and healthy ways.

The tools students with EBD need to be taught are separated into four main domains: “(1) life skills and social competencies, (2) health promotion and problem behavior preventions skills, (3) coping skills, conflict resolution, and social support for transitions and crises, and (4) positive, contributory service” (Elias & Weissberg, 2000, p. 187). Providing students with EBD tools within these domains allows them to better handle frustration and conflict so they can limit maladaptive behaviors inhibiting academic and social growth. These behaviors limit access to general education classrooms, so direct instruction within these four areas will further assist students with EBD to manage emotions appropriately.

Studies show a positive effect when teachers also apply cognitive-behavioral therapy when working with students with anxiety (Mathur & Schoenfeld, 2009). This type of therapy is applicable for teachers to use as school-based interventions and social skills training for students with EBD. Common intervention techniques utilized to promote healthy behaviors that inhibit maladaptive behaviors in times of anxiety and/or conflict are rapport-building, identification of specific stressful situations, exploration of individual responses to anxiety, relaxation training, coping strategies, and managing anxiety. These strategies show benefit for students with EBD as it directly teaches students how to manage frustration and emotions in times of conflict. Mathur and Schoenfeld (2009) and Elias and Weissberg (2000) discuss the benefits of social skills training for students with EBD. Such training has empirically demonstrated being an asset to the classroom.

Classroom management strategies impact a student with EBD’s performance. The teacher’s role in improving students’ classroom behaviors is imperative as it relates to classroom

management strategies (Colpin, Leflot, Lier, & Onghena, 2010). Behavior management influences behavior through reinforcement. Many teachers find that most maladaptive behaviors emitted in the classroom are trivial, so showing positive remarks toward behaviors favorable to a productive classroom environment warrant an increase in said behaviors. Preventative measures such as praise and other positive reinforcement increase the likelihood that students will display acceptable behaviors within the classroom before instruction takes place. When students feel valued, they are likely to perform when the academic tasks require them.

Teaching students appropriate behaviors directly supports a school and classroom environment where students with EBD know what is expected of them. This intervention proactively communicates to students with EBD the types of behaviors that are permissible and the types of behaviors that result in removal from the classroom (Hester, 2002). Teaching expected behaviors provides students with knowledge of what types of replacement behaviors serve the same function as the maladaptive behaviors, and it affirms positive behavior. Classrooms that take the time to teach the expected behaviors see positive results in students with EBD. Maladaptive behaviors such as aggression, withdrawal, and acting-out behaviors are replaced by behaviors suitable for a learning environment. These practices promote a school and classroom climate that supports positive child behavior (Hester, 2002).

Antecedent physical activity is a field of intervention that shows benefit to students with EBD. Teachers of students with ASD in conjunction with EBD have seen a decrease in the prevalence of maladaptive behaviors within the classroom (Bray, Kehle, Nicholson, & Van Heest, 2011). Antecedent physical activity shows improvements in students' active engagement in the classroom, an area of need for students with EBD. With antecedent exercise, students

respond to academic demands in a positive way. Instances of work refusal decrease as participation in the lessons increases.

According to Canella-Malone et al. (2011), teachers that utilize antecedent physical activity throughout the day see benefit especially with students that exhibit aggressive behaviors. Students that are provided ongoing physical activity throughout the day have seen a decrease in behaviors such as spitting, hitting, fighting, throwing, yelling, and property destruction. This intervention is feasible to implement in the classroom and does not take significant instructional time. Engagement with instructional tasks lends itself to better learning outcomes for students and the teacher (Bray et al., 2011).

Summary

This literature review addresses the concept of behavior in the elementary school classroom as it focuses on elementary students with EBD. Understanding the importance of appropriately dealing with maladaptive behaviors of students with EBD is critical in creating an educational environment of trust and academic learning. Preventative measures are vital in enabling students to avail themselves to an education.

As educators work with students with EBD to address maladaptive behaviors before, during, and after instruction, improvements in behavior and learning improve. Students avail themselves to an education only after they feel trusted and valued and the teacher has proven he or she is dedicated to the success of the student. Interventions are effective when they are utilized appropriately by teachers to meet the individualized needs of students within their classrooms. Structured classrooms, identified acceptable replacement behaviors, and modified instruction play a key role in eradicating maladaptive behaviors from a classroom of students with EBD.

Research studies prominently support the use of physical activity to aid students with EBD to manage maladaptive behaviors. It shows benefit with students with ASD to become actively engaged in learning, and it shows a decrease in the intensity of aggression with students with EBD. Antecedent physical activity has its place in behavior programs, but studies show that trust and rapport are compulsory before antecedent interventions are considered effective.

CHAPTER III

METHODS

The purpose of this study was to determine the impact of utilizing antecedent physical activity for ten minutes each morning on maladaptive behaviors.

Design

This study used a pre-experimental design with a variant of a one-group pretest-posttest design. It was based on a convenience sample of six students in a BLS classroom in grades four and five. The dependent variable during this study was a behavioral score based on a percentage of points earned on a point sheet for each student in the area of safety, responsibility, and respect. The independent variable during this study was ten minutes of antecedent physical activity each morning. This physical activity was in the form of a workout video found on YouTube that was geared for elementary students that was both engaging and humorous (Kids Workout with Paul Eugene, 2010). Baseline data was acquired by collecting twenty days of point sheet data in the area of safety, responsibility, and respect. Data was then compiled into a percentage of points earned out of possible points available. Post-intervention data was collected the same way for twenty days during administration of the intervention. A comparison of baseline data to post-intervention data was compared to determine if the null hypothesis could be supported.

Participants

The participants in this study included six students in a special education BLS classroom located in a suburban area in the mid-Atlantic region. This behavior support classroom consisted of two students in the fourth grade and four students in the fifth grade. Students in this classroom exhibited significant behavioral needs that were disruptive to the learning environment and created educational concerns. Disabilities prevalent in this classroom were

emotional and/or behavioral disorders (EBD), autism spectrum disorders (ASD), learning disabilities (LD), and/or attention deficit hyperactivity disorder (ADHD). Demographic data among students in this classroom included one African American male and five Caucasian children (one of which is female). All six students had Individualized Education Programs (IEPs), which encompassed goals in the area of behavior. There was an additional student who joined the classroom after the baseline data was collected. Although the student participated in the exercise program, he was not included as a study participant. Prevalent maladaptive behaviors exhibited by students in this classroom included calling out, refusing to complete work, using disrespectful speech to teachers and peers, and creating unsafe environments.

Instrument

The instrument used for this study was a point sheet tracking behavioral data in the area of safety, responsibility, and respect. The point sheet was created by the behavioral interventionist at the school and was completed by the classroom teacher and/or the instructional assistant in the classroom who have been trained in how to assign points. The point sheet had been in use in the classroom since the beginning of the school year. When the teacher was not present during specials classes and lunch the instructional assistant traveled with students. This ensured consistency when assigning points to students throughout the day.

This point sheet gave identification of the specific behaviors observed in the areas of safety, responsibility, and respect. Behaviors that were considered “safe” included sitting in chairs appropriately, not harming one’s self physically, and not harming others physically. Behaviors that were considered “responsible” included paying attention, completing work, raising hands when needing attention, and staying in an assigned location. Behaviors that were considered “respectful” included being honest, using nice talk to others, and following

directions. Each student had two additional categories on the point sheet that were targeted towards specific goals for the student. Due to the variability in individual goals, points earned in the individual categories were not included in the study data. The point sheet was used individually for each student in the BLS classroom and was carried with each student throughout the day.

This data collection tool had a separate box for each aspect of the day that was tracked and allowed for the student to receive a two, one, or zero under each specified category. If a student did an “exceptional” job in that given area, he or she received a two. If the student did an “okay” job in that given area, he or she received a one. If a student did a poor job in that given area, he or she received a zero. The following were the areas of the day that were tracked on the point sheet: PM Bus/Dismissal, AM Bus/Arrival, Morning Work, Reading/Language Arts, Special, Reading/Language Arts, Recess, Lunch, Math, and Science/Social Studies/Health. The lengths of time for each period varied. The PM Bus/Dismissal, AM Bus/Arrival, Morning Work, Recess, and Lunch blocks each totaled 30 minutes. The other blocks on the point sheet each totaled one hour. The student could have received a two, one, or zero for safety, a two, one, or zero for responsibility, and a two, one, or zero for respect in each area daily.

The total points from the categories earned across the data collection period were totaled to produce a behavioral score based on the percentage of points earned out of possible points available. On days that did not have delayed openings due to snow, the total points possible in the areas of safety, responsibility, and respect total 60 points. To calculate the percentages for each student daily, the student’s total points earned in the areas of safety, responsibility, and respect were divided by the number of points possible for the day. Days with delayed openings were calculated the same way, but the total was not out of 60, but rather closer to 40, in which

the points earned would be divided by this total. For example, if a child earned 35 points for the day, and there were 40 points possible due to a delayed opening, the percentage was determined by calculating 35 divided by 40. Students that were absent any days during the intervention had the total points they earned during their participation in the study divided by the total number of points possible given their attendance. There is no validity or reliability data for the behavioral point sheet.

Procedure

This study was conducted over the course of a forty-day period covering school days from mid-December, 2013 to late March, 2014. It is important to note there were nine snow days during the course of the study in which the schools were closed. Baseline data was acquired on Mondays, Wednesdays, Thursdays, and Fridays for twenty days prior to the intervention. Tuesdays were not included in baseline or intervention data due to scheduling conflicts. During the first twenty days of the study, the investigator (classroom teacher) collected baseline data by compiling point sheet data in the areas of safety, responsibility, and respect.

After baseline data was collected, the investigator shared with students the intervention that was going to be put in place each morning after arrival. The investigator shared that there would be a YouTube video that the class would follow for ten minutes every Monday, Wednesday, Thursday, and Friday morning from 9:30am to 9:40am. The investigator did not share the purpose for the exercise other than that it would be a great way to “warm up” each day. The purpose for not disclosing to the students that they were participating in a study was to protect the validity of the study from students consciously or unconsciously altering their behaviors.

Students were told participation in this activity each day would result in class money, which could be used to purchase rewards at the end of each week. This motivation sought to encourage buy-in from students to put forth adequate effort with the daily intervention.

After the plan was shared with students, the intervention was used daily (excluding Tuesdays) and data was collected. Students would arrive to school at 9:05am each morning asked to eat their breakfast, write down homework, and use the bathroom by 9:30am, which was the time the exercise started each day. The exercise video lasted ten minutes and was used from 9:30am to 9:40am every Monday, Wednesday, Thursday, and Friday. The intervention was done in the classroom, and the instructional assistant and teacher performed the exercises with the students. Days that had delayed openings operated the same way. Rather than opening at 9:05am, the days started at 11:05am, and the intervention would be utilized from 11:30am to 11:40am. The intervention took place over twenty days, and point sheets were completed for each student. At the end of the twenty day intervention period, data was compiled to produce a behavioral score.

The mean behavioral scores for each student during the baseline and intervention period were compared using a non-independent sample t-test.

CHAPTER IV

RESULTS

The purpose of this study is to determine the impact of utilizing antecedent physical activity for ten minutes each morning on maladaptive behaviors.

The results of the study failed to reject the null hypothesis that there will be no difference in the behavioral score by students in an elementary BLS classroom during the baseline trial period and during the intervention period when antecedent physical activity is used for ten minutes each morning. There was no significant difference in the Behavioral Score of students during the baseline period (Mean = 92.40, SD = 4.32) and during the intervention period (Mean = 91.24, SD = 5.42)[$t(5) = .61, p > .05$]. Table 1 shows the means, standard deviations, and results of non-independent sample t-test comparing behavioral scores per student during the baseline and intervention period.

Table 1

Means, Standard Deviations, and t-test Result for Comparison of Behavioral Scores from Baseline and Intervention Periods

Condition	Mean	Std. Deviation	t statistic
Baseline	92.40	4.32	.61 (NS)
Intervention	91.24	5.42	

n = 6, df = 5

NS = non-significant at $p \leq .05$

CHAPTER V

DISCUSSION

The purpose of this study was to determine the impact of utilizing antecedent physical activity for ten minutes each morning on maladaptive behaviors.

Findings

The results of the study show that there was no significant difference in the behavioral scores of students subsequent to the physical activity intervention. The null hypothesis stated there will be no difference in the behavioral score by students in an elementary BLS classroom during the baseline trial period and during the intervention period when antecedent physical activity is used for ten minutes each morning. The results of this experiment failed to reject the null hypothesis, and the mean behavioral score for each student did not significantly change over the duration of the experiment.

Practical Implications of the Research

A practical implication of the research is that although previous research has suggested behavioral benefits for exercise, the current study did not provide evidence that antecedent physical activity for ten minutes a day for children in a behavior classroom is effective as an intervention in limiting maladaptive behaviors or creating a more productive classroom environment. Based on the preliminary findings of this study, teachers in a behavior classroom utilizing ten minutes of physical activity should not expect to see an improvement in behavior, at least as measured by the type of point sheet used in the current study. Observations suggest that maladaptive behaviors could increase as a result of the intervention itself. One student during this study was triggered behaviorally by the exercises that took place first thing in the morning.

Theoretical Implications of the Research

The current study suggests that not all exercise interventions are effective for reducing maladaptive behaviors. The current study suggests that ten minutes of exercise a day is insufficient for improving classroom behavior among BLS students. Taking time out of the busy morning to watch a video and exercise for such a small amount of time has the potential to create more problems than the intervention was even intended to thwart. Exercise, as an intervention, needs to be rigorous enough for students to exert physical energy, and it also needs to take a considerable amount of time in order for students to see benefit in participating in the activity.

Threats to Validity

The sample size of the current study was a threat to validity. This limitation significantly impacted statistical power. Since the findings were based on very few people, the sample might not have been adequately representative of the population.

The BLS class used for the study was homogeneously grouped by students exhibiting maladaptive behaviors. Thus, results can only be generalized to students that exhibit maladaptive behaviors accompanying these specific disabilities within a self-contained behavior classroom. This fact was also a threat to external validity.

Another threat to the validity of the study was the length of time the intervention was implemented. This action research study was conducted over a 40-day period. Baseline data was acquired the first twenty days of the study. The following twenty days, the physical activity intervention was put in place and data was collected. It is possible that a longer period of time would have yielded different results.

An additional threat to the validity of this study was the inconsistency in the schedule. There was a multitude of snow days that either closed schools or caused a delayed opening,

which hindered consistency. Further, this intervention was not utilized on Tuesdays due to a scheduling conflict. This lack of routine further limited the validity.

This intervention was used during state testing nine days of the experiment. During state testing, tension within the classroom was high and students expressed anxiety. Therefore, there was a threat to validity due to changes in daily routine and limited structure over the course of the school day. Those days were not representative of a typical school day.

A further threat to validity during this study was the behavioral point sheets. Two different adults were filling out behavioral point sheets. Although the adults filling out the sheets were trained in the method and were aware of the criteria for the maladaptive behavior categories, there could have been inconsistencies. In addition, both adults knew that the point sheet data was going to be used as an outcome measure in the study. This reality created the possibility of unconscious bias in awarding points.

Results of this study can only be generalized to the frequency of the behaviors measured on the utilized behavioral point sheets. Those behaviors fall under the categories of safety, responsibility, and respect. This study measured specific behaviors and, therefore, only allowed for generalizations according to the frequency of these behaviors.

Connections to Previous Studies

Prior to this study, other studies had been done to show the impact antecedent physical activity can have on children with emotional and/or behavioral disorders (EBD), autism spectrum disorders (ASD), learning disabilities (LD), attention deficit hyperactivity disorder (ADHD), and/or conduct disorders (CD). One particular study demonstrated that when physical activity was used with students with ASD, there was an increase in academic engagement in high-functioning students with autism (Bray et al., 2011). Another study indicates that

antecedent exercise was effective in decreasing the frequency of challenging behavior to zero or near-zero levels in students with moderate to severe developmental disabilities and an emotional disorder (Canella-Malone et al., 2011).

In the current study, and the prior studies, physical activity done as an intervention to limit maladaptive behaviors did show a positive impact on students. In the Bray et al. (2011) study, jogging was used each day for 15-20 minute durations. The Canella-Malone et al. (2011) study included the physical activity intervention eight different times during the day. Further, this study encompassed ten different exercises that students would use.

The Canella-Malone et al. (2011) study included three students, all of whom were male. The exercises included eight students, but only three students' data was included in the intervention. The Bray et al. (2011) study only included four students, all of whom were male. Thus, the data of these studies was limited to male students with emotional, behavioral, and/or developmental disabilities. Although the studies differed in the methods and participants used, the results found physical activity, as an intervention, to be a positive element in thwarting maladaptive behaviors in the classroom.

The results of the current study differed from the aforementioned two studies because this study involved six students in a classroom encompassing a multitude of disabilities (ASD, ADHD, EBD, etc.). In addition, this study utilized ten minutes of physical activity each morning and did not limit the study to males. One of the six students involved in the study was female. This study also utilized a point sheet to acquire behavioral scores for students while the other studies used tally sheets and observation charts to record frequencies of behaviors.

In considering the differences in the current study from past studies, it seems likely that a really important difference was the amount of time allocated to exercise. Past studies have seen

more positive results with a minimum of fifteen minutes for the intervention. It may be that there is a minimum amount of exercise needed to make a difference.

Another important factor that might have contributed to the differing results was that in the other studies, the intervention lasted for a period longer than 20 days. Previous studies lasted many weeks longer with fewer interruptions to the schedule, which might have benefitted the study. Students were accustomed to the routine.

Implications for Future Research

Since conducting this experiment, the researcher has gained insight in how vital consistency is when working to limit maladaptive behaviors. When utilizing physical activity as an intervention, it is necessary to ensure that a routine is followed and expectations are clear for participating students. Children with emotional, behavioral, and/or developmental disabilities need consistency and routine when an intervention is being used.

Future studies should also consider performing the physical activity for longer than ten minutes. Past studies have seen more positive results with a minimum of fifteen minutes for the intervention. The intervention should also be done more than once a day as many of the maladaptive behaviors were observed after lunch. Performing physical activity more frequently would hopefully limit maladaptive behaviors over the course of the entire day.

A future study could potentially compare the impact of different lengths of exercise periods. Another idea would be to study how many weeks an exercise program needs to be in place in order to be effective. If teachers understood the minimum time demands for the intervention, it would allow for better planning and would also give them guidelines as to when to expect to see behavioral improvement.

When collecting data for future studies, it would be wise to have one individual fill out the behavioral point sheets to ensure consistency and keep the data collection process reliable and valid. It will also be better for the person filling out the point sheets not to be aware of the study conditions.

Future research should also consider using different outcome variables such as academic performance and/or pro-social behaviors. These additional outcomes might provide behavior classroom teachers further insight as to the benefits of physical activity.

Summary

The results of this study show there was no significant difference in behavior when ten minutes of antecedent physical activity was used as an intervention to limit maladaptive behaviors. Although no significant differences were found in the frequency of maladaptive behaviors, the study had limitations which may have impacted the lack of positive findings. Although the current results do not provide statistical evidence for the value of the intervention, previous research studies suggest that it would be worthwhile to extend the length of the intervention in both the duration over the course of the school year and the length of time each day. Such adjustments to the intervention would hopefully improve the results and make a better case for the effectiveness of antecedent physical activity as an intervention for limiting maladaptive behaviors.

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