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Emotional Support Dogs' Effects on Anxiety, Depression, and Somatization in Elementary Students

Truman Arthur James Spring
Walden University

Walden University

College of Social and Behavioral Sciences

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Truman Spring

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Review Committee
Dr. Melody Moore, Committee Chairperson, Psychology Faculty
Dr. Megan Baril, Committee Member, Psychology Faculty
Dr. Neal McBride, University Reviewer, Psychology Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

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by

Truman Spring

MA, Walden University, 2010

BA, Simon Fraser, 1976

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Within the last few decades, there has been an ever-increasing clinical role for trained emotional support dogs (ESD) and their trained therapists in hospitals, courtrooms, and schools. More recently, within the last 5 years, there has been a prevalent trend toward introducing ESDs into schools, which has created an ongoing controversy about the legitimacy of this practice due to the lack of objective data and research on the topic. In this study, archival data analysis was conducted using data from 68 students with elevated scores for anxiety, depression, or somatization, 34 of which were in the treatment group and the other 34 in the control group. A quantitative approach was used to determine if the presence of an ESD in the classroom was associated with changes in teachers' ratings of students' scores for anxiety, depression, and somatization behaviors as assessed by the Behavioral Assessment System for Children over a 6-month period for children who were identified as having an emotional or behavioral disorder by the schools and district. The results indicated a statistically significant posttreatment difference between the scores for the treatment group and the control group. The results of the study provide quantitative data to support the current use of ESD programs in schools. The implications for positive social change include providing schools with an option for a low-cost, easily implemented, universal intervention that can assist students who struggle with mental health, some of whom may not otherwise have been identified as needing support. All students receive the benefit from the program without having to be singled out or labelled as would be the case with traditional pull-out programs.

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Dedication

I dedicate this study to my wife, Natashia Bacchus, who has helped me considerably through this process with unwavering devotion. I could not have completed this process without her. My children, Andrea and Mark, who have been unwitting participants throughout my academic career. My parents, Jack and Celia, for their support, and my grandma, Porter, whose presence has guided me throughout this journey.

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One never does a project like this alone. I would like thank Dr. Melody Moore and Dr. Megan Baril for their time, energy, and expertise….and patience. I would also like to acknowledge Ms. Cat Heck from Student Success who has been a mentor and guided me throughout this journey.

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Chapter 1: Introduction to the Study

Introduction

Students with mental health disorders have been a growing concern over the last decade, and it has fallen to school districts and teachers to find alternative approaches to address the needs of these students (Salerno, 2016). The approaches that are used to support student mental health are limited by training requirements, the cost of specialized resources, and the ability to maintain program efficacy due to such factors as the movement of teachers to new schools or districts (Harrington, 2015). The focus of this study was to examine an innovative practice that allows schools and teachers to address the mental health needs of students through the use of an emotional support dog (ESD) or comfort dog. It is hoped that this study will give educators an evidence-based approach to working with the population of children with emotional and behavioral disorders in the classroom. Although there are a variety of mental illnesses diagnoses, in this study I examined children with anxiety, depression, and somatic behaviors, thereby meeting the criteria of having an emotional or behavioral disorder according to the school district of focus in this study.

The popularity or perceived benefits related to animal companionship have been an ongoing discussion for years, and there is evidence that this dog/human relationship has gone on for over a millennium (Miklosi, 2014; Netting, Wilson, & New, 1987). Within the last few decades, there has been an ever-increasing clinical role for trained ESDs and their trained therapists in hospitals, courtrooms, and schools (Krause-Parello, Thames, Ray, & Kolassa, 2018). Within the last 5 years, there has been a trend toward

introducing emotional support or comfort dogs into schools, which has created an ongoing controversy about the legitimacy of this practice due to the lack of objective data and research on the topic (Schoenfeld-Tacher, Hellyer, Cheung, & Kogan, 2017).

The Center for Disease Control and Prevention (2018) suggested that within the age group of 6 to 11 years old, 2% of the general population has been identified as having depression. To compound this problem, Mullen (2018) suggested that young children in this age range lack the emotional language to articulate their symptoms, so in order to understand where the student is coming from, adults must pay close attention to the students' verbalized physical ailments (i.e., somatic concerns), anxiety symptoms, and their behaviors. Kamphaus (2015) designed the Behavior Assessment System for Children, Third Edition (BASC-3), a behavior rating scale that has been validated and identified as age-appropriate, to classify the mental health symptoms of children.

In this study, I used a quantitative approach to determine if the presence of an ESD affects the scores for internalized behaviors (i.e., anxiety, depression and somatization) in the BASC-3 Teacher Report Scale TRS for elementary students. The data used in this study were archival and from students who were 6 to 11 years of age located at a school district in the southern interior of British Columbia, Canada. These students were classified by the school district as having mental health difficulties according to the criteria set forth by the British Columbia Ministry of Education.

Background

The bond between humans and animals has developed over many centuries, but more recently, the benefits of these bonds and their place as therapeutic tools in modern

society have been recognized and studied in various contexts (Perri, 2016). It is now generally recognized that the human animal bond (HAB) has a place in social emotional programming in elementary schools and can create a positive impact on student behavior and academic success (Bosacki & Tardif-Williams, 2019).

Hines (2003) found evidence to support the importance of HAB theories. Through an examination of the literature from the past 30 years, Hines concluded that the development of HAB theories has kept pace with the findings in the current field of research. Hines and Hosey and Melfi (2004) suggested that HAB research will continue to support the examination of human-animal interaction on mental health and well-being. In this study, I built on this previous body of research to focus on the potential benefit of emotional support animals in an elementary setting with children who have mental health difficulties.

HAB theory was the focus of a study conducted by Anderson and Olson (2006) who used an ESD to examine the de-escalation patterns of six special needs elementary students and the time it took for them to shift from a state of high arousal to a calm state. The authors found that the relationship that was created between the dog and the students had a significant impact of shortening the de-escalation period. Further observations suggested that these students also acquired interpersonal skills in the areas of responsibility, respect of others, and learning (Anderson & Olson, 2006).

Although the results from Anderson and Olson (2006) seem encouraging, their study had its limitations. First, the sample size for the study was very small. making it difficult to draw inferences for children with mental health concerns. A further limitation

of Anderson and Olson's study was that the qualitative data collected was from the teachers and staff in the special education program. Surveying teachers and staff has the potential to create bias because of the subjective nature of the measurement; behavior-rating scales are a more accurate measure of student's behaviors or changes in student behaviors (Chafouleas, Kilgus, Riley-Tillman, & Welsh, 2012).

Given the limitations of studies like Anderson and Olson's (2006), Nimer (2006) decided to conduct a meta-analysis on the effectiveness of animal-assisted therapy within school and facility settings, examining 250 studies and finding that there was a moderate beneficial effect of animal-assisted therapy in four key areas: behavioral concerns, medical problems, autism spectrum disorders, and emotional support. Nimer's meta-analysis supported the theory that the HAB facilitates social emotional growth in some people; however, there was a question as to what type of dog activity might influence an emotive effect on a person. Sommerville, Swanson, Robertson, Arnett, and MacLin (2009) examined this question using a quantitative approach monitoring physiological data. Using students between the ages of 7 and 12 who were diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), they recorded the heart and pulse rates before and after students handled a dog. The researchers found that after 5 minutes of handling a dog their subject's heart and pulse rates decreased, creating a calming effect. Considering the students in this study were diagnosed with ADHD and exhibited a lack of impulse control, low self-esteem, and high anxiety, the short-term results were promising for students that internalize their symptoms. The authors in this study failed to take

measurements after the 15-minute test period, and as a result, it was not possible to determine whether handling a dog had a long-term benefit for these students.

Beetz, Julius, Turner, and Kotrschal (2012) found similar results when they examined the response of 47 children (ages 7 to 11 years old) who were diagnosed with insecure/disorganized attachment. They divided the children into three groups: (a) a control group with a human, (b) a group having only a therapy dog, and (c) a group having only a stuffed toy dog. The researchers measured the students' cortisol levels and determined that the exposure to the therapy dog, which also had a physical component such as petting, had the greatest positive effect on reducing the level of stress in those students. The greatest decrease in cortisol levels among the three research groups was found when the child was exposed to a therapy dog. The researchers concluded that there should be an increase in animal-assisted education in schools and that therapy dogs enhanced student learning and performance through the reduction of stress for children with insecure/disorganized attachment. A broader implication of these findings suggests that students with internalizing symptoms might benefit from the calming effect that is created by the presence of a therapy dog, thus allowing them an opportunity to learn and focus on other skills to help them self-regulate.

The research by Friesen (2010) on the effects of animal-assisted counseling programs in elementary settings supports the recommendations of Beetz et al. (2012). Specifically, Friesen found that, although the presence of the dog was essential for good results, the success of a therapy dog program was also contingent on the teachers having a willingness and understanding to develop a clearly defined educational program with

goals and objectives in place. Furthermore, Friesen's research underscores the need for a dog program in a school to have formal goals and objectives that are well articulated and relevant as well as for teachers who are accepting and willing to support the program. It is interesting to note that the teachers in the current study voluntarily had dogs in their classroom because they felt that it might help students and articulated goals and objectives were part of the student's individual education plan.

Much of the data gathered in the published research was reliant on the teacher's anecdotal and subjective observations of the students' behavioral, emotional, or relational states (Briesch, Chafouleas, & Riley-Tillman, 2010; Campbell, Dobson, & Bost, 1985; Chafouleas, Kilgus, Jaffery, Riley-Tillman, Welsh, & Christ (2013); Lane, Oakes, Harris, Menzies, Cox, & Lambert (2012). For example, Chafouleas et al. (2012) investigated the diagnostic accuracy of behavior rating scales in screening elementary school students for programs based on teacher ratings. In order to conduct this research, the authors reviewed 20 completed behavioral consultations and found that using a quantitative behavior rating scale highlighted changes in children's behavior much more accurately than the teachers' observation of the change in students. Essentially, the teachers' perception of behavioral change in a student did not truly reflect the actual changes in the student. Furthermore, Chafouleas et al. found that normed behavior rating scales had a moderate to high identification rate of behavior risk in elementary school students.

The evidence from the research cited above suggests that educators are less accurate in identifying and screening internalized student behavior than standardized measures designed specifically for this purpose. This is important given that Mullen

(2018) suggested that young students do not have the necessary language to convey their emotional symptoms. Because of this, teacher observations alone might not initiate further assessment or screening for students who are truly at risk. However, an added intervention such as a dog program in the school, might intercede in two ways. First, the students may get needed emotional support for their internalizing difficulties even though the teacher has not formally identified the student as struggling in this area. Second, as Friesen (2010) suggested, the development of a dog therapy program that has clear goals, objectives, and a willing teacher can enhance success. Although a teacher may lack the ability to recognize students with internalizing challenges, being part of the inception of a dog therapy program in their classroom has the potential in and of itself to increase the teacher's awareness of students with internalizing symptoms and behaviors.

Finally, although the scope of this study is limited to those students aged 6 to 11 years old who were previously classified as having mental health difficulties evidenced by their scores for anxiety, depression, and somatic behaviors on the BASC-3 TRS, the findings of this research will add to the broader support of the use of dogs in the general population. Maujean, Pepping, and Kendall (2015) conducted a meta-analysis of the literature on animal-assisted therapy to identify studies that used only random controlled trials. A total of 66,180 articles were examined; however, after elimination due to duplication, unrelated titles, and those that did not meet inclusion criteria, only eight studies remained. Based on their meta-analysis, the researchers concluded that animal-assisted therapy benefits a wide range of individuals from children with autism to adults with specific psychiatric disorders such as schizophrenia. Maujean et al. also concluded

that more randomized research trials would be beneficial to this field of study. Within this study, I hope to contribute to this area of research and provide more data on the impact of HAB on students with mental health difficulties, evidenced by their scores for internalizing behavior, thereby supporting the development of animal-assisted programing for healthy school communities.

Problem Statement

The prevalence of childhood anxiety in the general population has been estimated to be between 9% and 32% (Creswell, Waite, & Cooper, 2014). Left untreated, young students typically experience poor working memory, processing difficulties, troublesome social relationships, and an overall decrease in their level of academic success (Ameringen, Mancini, & Farvolden, 2003). These children are also less likely to finish elementary school (Ameringen, Mancini, & Farvolden, 2003; Haspempour & Mehran, 2014). Furthermore, the National Institute of Mental Health (NIMH; 2018) estimated that for children in the 6- to 11-year-old age group, 2% of that population presents as depressed. Unfortunately, there is no published data on the number of children within school districts that are designated as having mental health difficulties that impede their learning or the learning of other students. This study will fill this gap in the existing research.

Concurrent with anxiety and depression in children can be somatization. Somatization is the tendency to have fears of being sick or to overly complain about symptoms related to health (Reynolds & Kamphaus, 2015). Somatic behavior has been associated with trauma as well as poor school performance, but it must be evaluated in

conjunction with other internalizing behaviors such as anxiety and depression (Reynolds & Kamphaus, 2015). The number of children who present with somatic behaviors in school does not appear to be identified in prior research because somatic symptoms are difficult for the average person to identify (Reynolds & Kamphaus, 2015).

Severe anxiety, depression, and other mental health disorders often have their roots in early childhood or adolescence (Merikanagas, He, & Bursting, 2011). The long-term consequences for those who do not receive early detection or intervention can include suicidal ideation and attempts, drug abuse, and the development of other severe mental health and social consequences (Killu & Crundwell, 2014). Given the tremendous impact of untreated mental health disorders, early identification and intervention are of paramount importance.

While there has been a considerable amount of research that has addressed links between ESDs and child outcomes more broadly, research has also addressed the effects of ESDs on childhood mental health disorders both in and out of the classroom. For example, ESDs have been shown to generally reduce anxiety (Nagengast, Baun, Megel, & Leibowitz, 1997), assist students with severe behavioral disturbances (Barker, Knisley, Schubert, Green, & Ameringer, 2015; Bassett, 2013; Kotrschal & Ortbauer, 2003), and support students with autism (Yeh, 2008). However, these findings are largely qualitative in nature and need to be evaluated using quantitative research tools to minimize respondent subjectivity. Therefore, the problem I sought to quantitatively understand in this study was whether the use of ESD in classrooms had a significant impact on the

levels of anxiety, depression, and somatization in children who were identified as having mental health difficulties as measured by the BASC-3 TRS.

Purpose of the Study

ESDs have been used in classrooms for a number of years to positively impact the prevalence of mental health disorders in children. There is a paucity of conclusive quantitative data that definitively establishes the benefit of this practice for children with anxiety, depression, or somatization, a population who may be the most likely to benefit from this type of therapy (Fujisawa, Kumasaka, Masu, & Kataoka, 2016; Lieber, 2000; Ryan, 2002). Specifically, Anderson and Olson (2006) found that qualitative data supports the use of ESDs in classrooms; however, they noted that finding quantitative data to support the use of ESDs in classrooms has been challenging.

Specifically, the question of whether support dogs can affect anxiety, depression, and somatization in children has not been thoroughly examined using quantitative methods. Though there is qualitative support for this idea, it should also be clearly established in quantitative terms. Therefore, the gap in the literature is the lack of empirical research that quantifies the benefits of ESDs for children with internalizing difficulties (i.e.,children who have elevated scores on the BASC-3 TRS in the areas of anxiety, depression, and somatization).

In this quantitative study, I used archival data from a school district in the southern interior of British Columbia, Canada to analyze if having an ESD in a classroom was associated with changes in the symptoms of anxiety, depression, and somatization in children with mental health difficulties. Specifically, the comparison treatment groups

were children in the classroom with an ESD (i.e., the treatment) and children in a classroom that did not have an ESD (i.e., the control). Both the treatment and control groups comprised children who had been diagnosed with emotional and behavioral disorders. I examined the differences in the levels of anxiety, depression, and somatization scores for children in the treatment group and control group. The time frame between the pre- and postmeasure was 6 months.

The ESD intervention program was part of an existing school district initiative that began 2016 in the southern interior of British Columbia, Canada. The dogs used in the intervention were trained, certified, and worked in school district classrooms. In the 2017-2018 school year, the school district assessed all students identified as Category H (meaning children with mental health concerns) using the BASC-3 TRS. The process involved having the student's classroom teacher fill out the complete BASC-3 TRS. The district behavior specialists then scored and interpreted the data. Six months after inception of the program, the classroom teacher filled out another BASC-3 TRS for all children meeting criteria as Category H, which was subsequently scored and interpreted by the district behavior specialists. The district behavior specialists then went through all of the BASC-3 TRS assessments (both pre- and posttreatment) and made a list of students' scores only in the areas of anxiety, depression, and somatization because these were the areas the district was interested in gathering data on. The district had collected and retained all of this data but had not analyzed it to determine if children's BASC-3 TRS scores for anxiety, depression, and somatization were impacted by exposure to an

ESD. The goal of this study was to use a mixed-design analysis of variance model to better understand the effectiveness of this intervention.

The results of this study could support schools and districts in implementing ESDs in the classroom. For schools, this would be a low-cost intervention that causes little additional work for the classroom teacher. The results of this study could support the use of ESDs as an evidenced-based intervention that could have a significant positive impact on children's mental health in the areas of anxiety, depression, and somatization.

Research Questions

RQ1: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' anxiety scores as measured by the BASC-3 TRS?

H_a1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0 1a$: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1b: The time lapse between the pre- and posttreatment measures has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1b: The time lapse between the pre- and posttreatment measures has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1c: The interaction between pre- and posttreatment anxiety scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$1c: The interaction between pre- and posttreatment anxiety scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ2: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old student's depression scores as measured by the BASC-3 TRS?

H_a2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2b: The time lapse between the pre- and posttreatment measures has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2b: The time lapse between the pre- and posttreatment measures has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2c: The interaction between pre- and posttreatment depression scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$2c: The interaction between pre- and posttreatment depression scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ3: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect in 6- to 11-year-old student's somatization scores as measured by the BASC-3 TRS?

H_a3: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3b: The time lapse between the pre- and posttreatment measures has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3b: The time lapse between the pre- and posttreatment measures has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3c: The interaction between pre- and posttreatment somatization scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$3c: The interaction between pre- and posttreatment somatization scores is not significantly different between the group that was exposed to an ESD and the group that was not.

Theoretical Framework

The theoretical framework I used for this study was the HAB theory, developed by Russo (1999). Within Russo's theory, there are three universal components:

1. There is a distinct relationship between a human and an animal.
2. A bond only exists if the relationship between the human and the animal is reciprocal, and
3. The bond begins to be established within a single contact; that the interaction between the human and the animal are mutually fulfilling.

This theory was relevant to the current study because it has been used in multivariant subject areas, which includes decreasing extreme behaviors in students (see Bassette, 2013; Friedman, Katcher, Thomas, Lynch, & Messent, 1983).

Nature of the Study

This study was quantitative and quasi-experimental in nature. There were treatment comparison groups (i.e., treatment and control) and the archival data were collected and arranged in these groupings by the school district after the data were collected for this study for the purpose of subsequent (i.e., post-hoc) analysis. The treatment group consisted of students, ranging in ages from 6 to 11 years old, classified with a mental health concerns who received the ESD intervention 2 hours a week for 24 weeks. The control group consisted of students, ranging in age from 6 to 11 years old, classified with a mental health concerns who did not have the ESD intervention in their classroom. Classroom teachers filled out the BASC-3 TRS, which was subsequently scored and interpreted by the district behavior specialists. Scores for the BASC-3 TRS

were gathered for both the control and treatment group 6 months apart (i.e., pre- and posttreatment). The district behavior specialists then compiled all student scores in the areas of anxiety, depression, and somatization. The district had this archival data but did not attempt to analyze or interpret it. The research questions I created were used to determine if there was a significant change in the scores of the treatment group as well as comparing the change during the 6-month interval between the treatment and the control group. The dependent variables for this study were the scores for anxiety, depression, and somatization as reported on the BASC-3 TRS, and the independent variable was the exposure or nonexposure to the ESD program dogs.

In this study, the students represented in the archival data ranged from 6 to 11 years of age and were from a British Columbia southern interior school district. All participating students were previously identified by the school as having mental health difficulties that support extra funding; as such, they all had a current BASC-3 TRS assessment on file that was filled out by their classroom teacher and scored and interpreted by the district behavior specialists. These children were all in regular education classrooms with peers who did not have designations of mental health difficulties. The ESD was in the classroom for 6 months for two 2-hour sessions per week. The ESD was not assigned to a specific child, but rather, in the classroom with all the children during the allotted timeframe.

The study implications for social change include alerting school districts as to whether there are benefits of an ESD program for children with mental health difficulties. This program could also have the potential to help improve the academic grades of

students (Malecki & Elliot, 2002; Roberts-Schneider, 2016). Specifically, Malecki and Elliot (2002) linked emotional regulation and academic success by finding that emotional regulation is a future index of academic success.

Definitions

For the purpose of this paper, I used the definitions created by Schoenfeld-Tacher et al. (2017) for three main types of support dogs used in our North American communities. As for defining the variables of anxiety, depression, and somatization, I used interpretations used by Reynolds and Kamphaus (2015) in their development of the BASC-3 TRS.

Anxiety: This is comprised of a number of behaviors, including excessive worrying, phobias, an attitude of self-deprecation, and a generalized expression of nervousness (Reynolds & Kamphuas, 2015).).

Depression: Symptomology that persists for an extended period of time that includes a shift or sudden change in mood, a negative perspective on life, and an overall demeanor of sadness (Reynolds & Kamphaus, 2015).

Emotional support dogs (ESDs): Dogs that do not have any specific training to support individuals with disabilities or tasks related to performance. However, they have been used to relieve anxiety, depression, and loneliness. These dogs are also referred to as comfort dogs (Schoenfeld-Tacher & Kogan, 2017).

Facility dogs: Within the literature, this term was used interchangeably with ESDs and therapy dogs that work within institutions including hospitals, courtrooms, and schools (Schoenfeld-Tacher & Kogan, 2017).

Internalizing difficulties: Elevated scores in the internalizing composite for the BASC-3 TRS. Specifically, the score is composed of the areas of anxiety, depression, and somatization (Reynolds & Kamphaus, 2015).

Service dogs: Dogs that are trained to work with individuals that have physical, emotional, mental health, or sensory impairments. The dog's training is performance and task specific to the individual's disability (Schoenfeld-Tacher & Kogan, 2017).

Somatization: A tendency to overexaggerate and prone to being hyper-sensitive about minor physical discomfort (Reynolds & Kamphaus, 2015).

Therapy dogs: These dogs are usually found in clinical settings with therapists. These dogs provide therapeutic contact and work with the therapist to help support individuals with their physical, social emotional, or cognitive needs (Schoenfeld-Tacher & Kogan, 2017).

Assumptions

Chomsky (1992) suggested that a rational discussion is only viable if there is a repository of shared assumptions. Within this study, I made several assumptions that had the potential to influence my perceptions and interpretations of the findings. My assumptions included that the presence of an ESD would have an impact on student rating scale scores for anxiety, depression, and somatization. I assumed that the staff were willing participants when they completed the BASC-3 TRS. I also assumed that the district behavior specialists, trained in Level B testing, were diligent in the collection, scoring, and interpretation of the data. Another assumption was that the district behavior specialists were accurate in transferring the scores from the assessment to a chart that

depicts all student's pre- and postscores. I assumed that the methodology I was using to analyze the archival data was appropriate to answer the research questions I have posed. My final assumption was that schools and school districts would not only be interested in my results but will use these results to inform policy and practice.

Scope and Delimitations

The scope of this study was limited to 34 students across 14 classrooms who received the dog therapy intervention (i.e., the treatment group) and 34 students across 14 classrooms who did not receive the dog therapy intervention (i.e., the control group). These 28 classrooms were in 14 elementary schools located in the southern interior of British Columbia, Canada. In this study, I focused only on archival data for elementary school children 6 to 11 years of age. Each student was previously identified through a provincial audit and assessment process as meeting criteria as Category H (i.e., a student with severe behavior or mental health disorders).

Limitations

Understanding the limitations of a study places the findings in context and allows the researcher the opportunity to judge the validity of the study's findings (Kirkwood & Price, 2013). An important limitation to this study was the small sample size due to the number of dogs meeting the district policy standards and the district regionalism; these factors make it difficult to generalize the findings of this study beyond children with mental health concerns in Canada. Another limitation of this study was that there is no universally accepted definition of ESDs, which could create confusion for other researchers. Finally, I examined the differences between the two time points (i.e., before

and after treatment), between the two groups, and any interaction effects as well. I employed a 2x2 factorial ANOVA method that tested for differences between two groups of students as well as examining change in the treatment group of students on the BASC-3 TRS internalization scores. Although I know that the students were from the same school district, I am not able to speak to other factors that could have influenced their scores, including socio-economic status, race, or culture.

Significance

It is my hope the findings from this research will help teachers, counselors, principals, and district support staff to further examine enhanced ways to address students' mental health. Using archival data that were already collected by the district on their ESD program will help educators determine the program's effectiveness in addressing students with mental health concerns within the classroom. More generally, I propose that these findings will potentially be able to generalize to support the mental health of all students.

Confirming the capacity of an elementary ESD program to positively affect students' mental health in the classroom emphasizes the benefits to schools and district support staff and has the potential for schools and district support staff to work in concert with each other to design, create, and implement effective strategies within the classroom to provide the best possible services to students. There is also a possibility that the results from this study might provide evidence to other schools and districts to develop more ESD programs for their classrooms. Additionally, this study could influence educators to examine other innovative ways to meet the mental health needs of students. For example,

educators may pursue learning more about other individual interventions to support students who struggle with internalizing difficulties, or learning other school-wide programming, like Everyday Anxiety Strategies for Educators, to ensure that the social and emotional needs of all children in their classrooms are being met.

Finally, the results of this study could add to the current body of knowledge that encourages school districts to use ESD programs to enhance positive social change by enhancing feelings of empathy towards others (see Crossman, 2016). More broadly, the positive findings from this study will add to the research emphasizing the benefits associated with HAB and animal companionship.

Summary

There is evidence to indicate that the companionship of dogs with humans has occurred for centuries (Miklosi, 2014; Netting et al., 1987). Over the last century, dogs have been specifically trained to work with therapists to support people with physical disabilities, mental health problems or intellectual deficits. Using dogs in the classroom has become very popular in the last few years, and there has been much discussion about their impact on the mental health of students (Algar, 2017).

A need exists to determine whether the presence of ESDs in the classroom setting can influence the prevalence of mental health disorders in children with emotional and behavioral disorders. Though there is qualitative support for this practice, it should also be established quantitatively, which would allow for the determination of students' baseline and the use of valid and reliable measures to ensure accuracy and consistency

between pre- and posttreatment. In Chapter 2, I will review the literature on the use of ESD in a number of settings and with a variety of demographics.

Chapter 2: Literature Review

Introduction

The purpose of this study was to establish, in quantitative terms, whether the presence of ESDs in the classroom setting affects anxiety, depression and somatization scores in children with mental health difficulties. This literature review includes a summary of scholarly, peer-reviewed journal articles pertaining to the use of ESD in school settings and their effect on student behavior in a variety of domains. The use of ESD in schools is a relatively new practice and, consequently, there is limited empirical research available. To gain a greater understanding of this growing field, this review includes research on the effects of ESD in schools on students' psychological states. Consequently, some research is older than what might be considered for inclusion in a dissertation literature review. I have reviewed all the research that pertains to the use of ESD on student behavior in the elementary setting but have also broadened this review to include an understanding of the scholarly literature on the use of ESD within the secondary and postsecondary environments.

Literature Search Strategies

I conducted an exhaustive review of the literature using the following databases: PsycInfo, Social Services Abstracts, ProQuest Social Sciences Premium Collection, SocINDEX with Full-text, PsycARTICLES, Social Work Abstracts, Psychological Abstracts, Social Sciences Full Text, ERIC, SAGE, Pub Psych, Child Development and Adolescent Studies, Educational Research Complete, and Google Scholar.

The key search terms used include *facility dog, service dog, therapy dog*, and *emotional support dog*; these were followed by the secondary addition of *elementary school, school, and educational setting*. Other key search terms included *behavior challenges, extreme behavior, deviant behavior, misconduct, challenging, risk, harm, learning environment, alternate teaching pedagogy, elementary school settings, AAT, animal-assisted therapy, attachment hierarchy, attachment theory, companion animal attachment, emotional social support, human–animal bond, dogs and social support*, and *animal-assisted intervention*. I continually reviewed the databases and key terms until no new information or articles appeared.

Theoretical Foundation

The theoretical foundation for this study was the HAB theory, a term first coined by Bustad at an international symposium in Vienna in 1983 (Hines, 2003). There are three universal components to the definition of HAB theory. First, the definition of HAB theory states that there is a distinct relationship between a human and an animal (Russo, 1999). Second, a bond only exists if the relationship between the human and the animal are reciprocal (Russo). Finally, the bond begins to be established within a single contact (i.e., the interaction between the human and the animal are mutually fulfilling; Payne, Bennett, & McGreevy, 2015). Payne et al. (2015) suggested that the primary components of HAB theory also reflect the ideal conditions for learning.

An example of the use of application of HAB in clinical settings can be seen in the work of such notable therapists as Freud (Coren, 2010) and Levinson (1969). Freud and Levinson found that their dogs added a great deal to therapeutic settings and

outcomes and that patients found the dogs promoted a trusting and nonjudgmental atmosphere (Coren, 2010). It is uncertain if Freud realized the use of HAB concepts; however, Levinson was aware that he was using HAB concepts and is considered the creator of the term *pet therapy*.

There has been evidence to support the existence of a HAB as far back as prehistoric times (Soares, 1985). The first recorded use of animal therapy was in 1792 with the Quakers at the York Retreat in England where they used dogs and other animals as a treatment regime for mental illness (Draper, Gerber, & Layng, 1990; Fine, Fine, & Land, 1996). The contemporary scientific roots of HAB theory are recognized in the work of Lorenz and Tinbergen in the 1930s (Hines, 2003). However, it has only been since the 1980s that the term HAB has been used to officially acknowledge the growing body of scientific literature in this field (Zinn & Beck, 2014). In the last 20 years, the study of HAB has become a scientific discipline (Beck & Katcher, 1983; Davis & Juhasz, 1985; Russow, 2002; Walsh, 2009; Zinn & Beck, 2014).

Although the HAB theory has been used to investigate the human and animal bond by researchers, the inconsistency of definitions of what is encompassed by animal therapy has played a role in inconsistent interpretation of results; therefore, comparison of findings across studies is difficult (Bayne, 2002; Davis & Balfour, 1992; Russow, 1999; Zinn & Beck, 2014).

Today, research in HAB theory has a variety of subject areas from decreasing blood pressure or extreme behaviors in students (Bassette, 2013; Friedman et al., 1983) to assisting returning soldiers returning from the Middle East with posttraumatic stress

disorder (Ritchie & Amaker, 2012; Westlund, 2014). Payne et al. (2015) suggested that the HAB contributes to the well-being of both species, not only through positive changes in attitude but also through quantifiable physiological changes. HAB theory is relevant to the current study because it has been used in multivariant subject areas, which include assisting with mental health concerns and decreasing extreme behaviors in students (Bassette, 2013; Friedman et al., 1983).

History of Companion Dogs

There is disagreement in the field about when dogs were truly domesticated or took the role of a companion with humans (Freedman, 2014). It is thought that the genesis of humans' relationship to canids had their roots with the indigenous people in Asia, Siberia, Australia, and North America (Freedman, 2014). The need for this pairing was predicated on mutual welfare and survival (Larson, 2012). Archaeological findings have uncovered what is called the Bonn-Oberkassel dog, which was found buried with a human dating to 14,200 years ago (Freedman). The human was buried embracing the dog, and this finding is considered the first completely undisputed evidence of a domesticated dog with a similar genetic and social affiliation to present day dogs (Germonpre, 2009). Many canine remains indicate that domestication of canids may have taken place as long as 36,000 years ago; however, these findings have been prone to dispute by many archeologists (Perri, 2016). The collective evidence from archeological findings dates the earliest dogs as being part of the hunter-gathering contingent rather than from agrarian society as was previously thought (Freedman & Wayne, 2017).

During the Viking period (79 to 1066 AD), domesticated dogs were used primarily as farm animals, for hunting prey, and as defense against unwanted dangers such as other humans or animals (Ferguson, 2009). Although there is certainly a domesticated relationship between human and dog during this period, collected text from this era cite terms including loyalty to the family, hunting and farm work; however, they do not indicate that dogs were used in any way as emotional support or personal companions (Ferguson, 2009).

During the medieval period (500 to 1600 AD) in Europe, dogs were used in much the same way as during the Viking period. Although dogs were used on the farm and for hunting, the medieval aristocrats introduced the concept of lap dogs. The women of the manor would spend hours with their canine lap companions. This trend was well documented and highly criticized by many members of medieval high society; however, it continued amongst the high society women despite the criticism (Fishman, 2003). It might be speculated that there was an emotional functionality between the owner and dog (Jordan, 2003).

Records and art exist that indicate that in ancient times dogs had been used with people with disabilities. The earliest record of the use of a dog for the blind comes from a wall in Pompeii dated 79 BC (Fishman, 2003). It was during World War I (1914-1918) that the use of dogs became strategically organized to support people in a new and different ways. The term *mercy dog* conveyed the dual role that these dogs delivered. During battles, mercy dogs brought medical supplies to the soldiers and medical field officers, but their other role was also to comfort men on the battlefield and the terminally

wounded as they waited to die (Worley, 2016). Mercy dogs were trained by the Red Cross and a conservative estimate suggested that at one point, nearly 50,000 of these dogs were employed in this activity (Worley).

Dogs were used with similar results in North America and Europe for World War II. Not only were the dogs placed in service to act as advance scouts for troops, they also had the dual role of acting as an emotional connection for soldiers who were lonely, scared, or wounded (Ritchie & Amaker, 2012). The same thing can be said for the wars in Korea and Vietnam (Dickon, 2017; Panella, 2010; Walter, 2011). Although there is a large body of anecdotal information in the form of letters from soldiers and written accounts of these dogs during the war, there was no extensive quantitative research completed to examine the impact on emotional support these dogs had on soldiers during their time in the battlefield (Crossman, 2016; Johnston, 2012; Kirk, 2014).

In 1924, most penitentiaries had their inmates working in silence at hard labor with the intent of punishing them rather than creating behavioral reform (Miller, 2013). It was during this period that Governor Gifford Pinchot of Pennsylvania attempted to create one of the first penitentiaries with a focus on the behavior rehabilitation of prisoners at Eastern State Penitentiaries (Miller, 2001). Pinchot had heard of dogs being used successfully in prison settings in the past and felt that a dog's presence would help with the morale of the prison inmates (Miller, 2013). Although having a clear intention as to how and why the dog would be used, Pinchot chose to announce the new program in a more clandestine way that would not upset Pennsylvania constituents who felt prisons should be punitive in nature. In the spring of 1924, Governor Pinchot sentenced his black

labrador, Pep, to life in Eastern State Penitentiary for killing the Pinchot household's cat. The announcement brought forward thousands of letters of outrage from people across the United States asking for the dog's release. However, Pep was never released nor was the dog confined to a single cell during the dog's incarceration. The clandestine intent and goal of Governor Pinchot, to support the emotional needs of prisoners using a dog, continued and grew as part of the prison's rehabilitation program (Miller, 2013). Pep passed away 10 years after being sentenced to life at Eastern State Penitentiary; however, the effectiveness of the emotional support program the dog was part of has now been emulated in many penitentiary settings with positive results (Mulcahy & McLaughlin, 2013).

As Pinchot was using dogs in the prison setting to act as an emotional support for prisoners, noted psychiatrist Sigmund Freud was practicing a parallel but clinically assisted technique using the ambient proximity of dogs. Freud suggested that dogs had a unique quality about them, and they were perceptive of the mood and tension present in those they encountered, especially with children (Coren, 2010). It was because of this inherent ability that Freud had his chow chow, Jofi, at all of the psychiatrist's sessions (Coren). Freud wrote about the use of dogs in therapy with his patients, and these writings ultimately gave legitimacy to the similar finding that Boris Levinson presented at a psychological convention in 1969. During this year, Levison helped to establish the professional use of animal-assisted therapy and coined it "pet therapy" (Lacoff, 1999). Levison (1969) suggested that the nonjudgmental manner of the dog helped children relax and open to extending and building a relationship with the therapist. It is interesting

to note that whether a dog is assisting a therapist or just an ambient presence in a setting, the dog's presence has been noted as being a catalyst in the building of the relationship process.

Attachment and Bonding Between Humans and Animals

A key chemical ingredient in perpetuating and building the relationship process is oxytocin. Oxytocin has been reported to control many complex emotional and cognitive interactions that have a direct effect on social bonding in both humans and animals. Romero, Nagasawa, Mogi, and Hasegwawa (2014) examined whether the neuropeptide oxytocin was created when animals and humans interact or whether oxytocin was only produced for species-specific social bonding to facilitate reproduction. Romero et al. found that when animals and humans interact in a positive way, on a regular basis, there is a release of endogenous oxytocin, which acts as a neurochemical mechanism that enhances sociality in both species. These researchers have suggested that the production of endogenous oxytocin in animals and humans is not driven by reproduction needs specifically; rather the oxytocin is an interspecies factor in creating social relationships and is a neurochemical that is essential in building sociality in all mammals (Romeo et al.).

Animal owners tend to see their companion animals as part of the hierarchy of relationships they have in their lives, essentially these companion animals become a component of their overall emotional support system. Meehan, Massavelli, and Pachana, (2017) surveyed 83 university students using a 31-item hierarchy scale investigating the emotional and supportive attachment people had to their companion dogs. The authors

found that four distinct components led to animal and human bonding. The first component involved the physical and proximal factors such as feeding, brushing, and playing. The next component was the emotional attachment created between the animal and human, followed by the mutual interaction with the animal daily, then the creation of a regular positive emotional response. The final component was the emotional and monetary value the students placed on their animal companions. Through this survey, the authors found that people felt that their companion animals played a significant role in supporting their emotional needs as great or equal to their relationship with family members or close friends. Further, Meehan, Massavelli, and Pachana, supported the idea of the human-animal bond in enhancing attachment and social support theory. This research indicated that people have emotional hierarchy and their dogs fit into that emotional hierarchy. The research suggested that dogs had higher status than the owners' siblings did but that the relationship with the dog was lower than their partners and close friends. The elevated status of dogs within this social hierarchy indicated that animals are an important additional source of social and emotional support.

Literature Review Related to Key Study Variables

Most people, who have owned a dog or have had a close relationship with one, will give an anecdotal account of the positive benefits they have experienced, from companionship to exercise. The research from the last three decades has explored how emotional support animals (ESA) had the potential to positively affect the mental health and the quality of life for individuals (Crossman, 2016; Nimer & Lundahl, 2007). In the

section of the literature review, I focused on reviewing research that examined the impact facility based ESD had on elementary students' social and emotional functioning.

Impact of Facility-Based ESD on Social Emotional Functioning

Davis (1987) investigated the importance of a dog in the development of self-concept in preadolescents. Twenty-two preadolescents were given three instruments to complete. These instruments were intended to measure the preadolescent's self- concept with a comparative to five affective dimensions that related to the human/dog dyad. The results indicated that preadolescents, regardless of gender, see the family dog as a best friend. Davis (1995) had similar results when he examined 122 preadolescents using a 26-item Pet Friendship Scale that also found a high friend relationship between preadolescents and their dogs. Relatedly, Bodworth, and Coleman (2001) found that this dog/child bond was much stronger in very young children who came from single parent homes. As these single parent children became preadolescents the level of the bonding between the dog and child was no different from preadolescent children raised by two parents. This bond between adolescents and their dogs has been similarly reflected in other research in this field (e.g., Ascione, 1992; Daly and Morton, 2006; Davis and Juhasz, 1995; Kens, Stuart-Parrigon, and Coifman, 2018; McNicholas and Collins, 2001). Broadly, the research emphasizes the unique role that dogs can play in the development of emotional support in children and adolescents.

Vidovic (1999) also examined the social and emotional benefits in elementary aged children of having a pet at home. Vidovic examined the variables of empathy, a child's attachment to their pet, the prosocial profile of the student, the child's sense of

loneliness, social anxiety, and how the child perceived their family dynamic. Vidovic studied 265 fourth graders, 295 sixth graders, and 266 eighth grade students. Vidovic found that those students who had dogs at home scored significantly higher on the variables of empathy and prosocial orientation. Further, students who indicated higher levels of attachment to their pets purported to have a more positive family climate than students who were less attached to their pets. The results of this study indicated that for students who had developed a relationship with a dog, there was a transference of prosocial abilities and skills to the school setting.

Other researchers found similar findings to Vidovic (1999) including Anderson and Olson, (2006); Beetz, Turner and Kotrschal, (2012); Hergovich, Monshi, Semmler, and Zieglmayer, (2002); Kortschal and Ortbauer, (2003); Rud and Beck, (2002); Younggren, Boisvert, and Boness, (2016). The overall findings from these studies indicated that having regular exposure to dogs reduces student aggression and contributed to children's social and cognitive development. If exposure to dogs reduces aggression in children, it may be that the same impact occurs with internalizing behaviors such as anxiety, depression and somatization. In my study, I tried to understand whether exposure to dogs will decrease students' internalizing scores for anxiety, depression, and somatization. Although many positive effects were found in the literature on the impact dogs have on children's social and emotional functioning, the use of dogs within classrooms could also pose potential concerns.

Within the parameters of this research, some of the potential concerns caused by having ESD in classrooms included that dogs may pose health, danger, or liability

concerns. Daly and Suggs, (2010); Schonenfeld-Tacher, (2017); Von Bergen (2015) suggested that selection and training of the animals prior to introduction to their support setting was a necessity to ensure that the dogs do not pose a physical danger to students. Dogs are also not put in classrooms where students have allergies to ensure that health related concerns are minimized. The liability, particularly in a school setting, has more to do with teachers and administration not being aware of district policies (Daly and Suggs); Hergovcih, Moshi, Semmler, & Zieglmayer, 2015). Therefore, with training and education, these factors can be mitigated.

Links Between Anxiety in Children and Emotional Support Animals

There has been extensive research on childhood anxiety. Factors that are also examined include the tendencies toward fearfulness, nervousness, phobias, and self-deprecation (Reynolds & Kamphaus, 2015). In 2003, Fox suggested that the primary factor for students to be successful in building good relationships and having academic success was in their ability to develop their social regulation. An estimation of childhood anxiety within the general population is now considered somewhere between 9 and 32% (Creswell, Waite, & Cooper, 2014). The long-term effects of allowing childhood anxiety to go untreated have an impact on working memory, difficulty maintaining relationships, general processing difficulties, dropping out from school, drug addiction, and possibly criminality (Ameringen, Mancini, and Farvolden, 2003; Hashempour & Mehran, 2014; Killu & Crundwell, 2014). Research by Merikanagas et al. (2011) suggested that severe anxiety and depression have their root in early childhood.

Much of the research on anxiety and dog programs has been done in the postsecondary university settings (Grajfoner et al., 2017). The results that have come forward from this research is certainly promising with respect to links with lowering anxiety levels. For example, Grajfoner (2017) worked with 132 university students using a dog program that had three conditions that was looking at the effect of a dog on anxiety using standardized anxiety scale instruments. These students were assigned to one of four conditions, which was done on a voluntary basis. The sessions lasted a total of 20 minutes. The first condition was a standard therapeutic session; the second condition was interaction with a dog and its handler; the third condition was with the dog alone; and the fourth condition, which acted as a control in the study, was just the handler alone. The results of the study indicated that the dog by itself had a significantly greater impact on reducing anxiety in students over the other three conditions. As such, I wonder whether the same results could be obtained in classrooms; this would limit the need for additional staff and offer a low cost and effective intervention to assist students with internalizing difficulties.

Anderson (2017) found similar results with the research team using 168 university students. They examined whether the interaction or proximity of a dog reduced stress and anxiety during exam times. In this study students were asked to answer a short survey regarding their experience and the results from the survey indicated that students purported to have had a collective reduction of their anxiety, regardless of gender.

Sloan-Oberdier (2018) examined the experiences of elementary school counselors working alongside therapy dogs. The findings indicated that the presence of a therapy

dog helped students who had difficulties with emotional regulation including anxiety, that the general tone of the school population was welcoming to the dogs, that the presence of a dog afforded teachable moments, and that some of the concerns that arose were easily dealt with.

In 2010, New York's Department of Education, in conjunction with Yale University and the North Shore Animal League, created a curriculum and program using emotional support dogs to help develop social emotional learning skills for K-5 classrooms. The Mutt-i-grees 'curriculum focus was on the development of empathy, decision making, and cooperative skills (Algar, 2017). Although the Mutt-i-grees program was introduced as a pilot program in New York City in 2010, the lead researcher, Matia Finn-Stevenson also collected data to conduct further investigations.

Matia Finn-Stevenson collected data from 42 kindergarten to grade 5 classrooms over a 3 year period. With the data, they conducted a program evaluation using the Bryant Scale for Students, Parent Involvement Scale, and the School Climate Survey. The classrooms studied were all from one school and were randomly assigned. Some classrooms received the Mutt-i-agrees curriculum and others did not. The data included 839 kindergarten to Grade 5 students and 42 classroom teachers. Survey information was also solicited from the school administrator and families. The classrooms used for the data collection were traditional as well as specialized classrooms including classrooms used for special education, skill development, or other specialized learning skills. The program evaluation focused on the development of social emotional skills in students and found that those classrooms receiving the Mutt-i-grees curriculum had a significant

increase in positive classroom climate, a reduction in anxiety and behavioral difficulties in students, and a perceived increase in student empathy (North Shore Animal League, 2017).

Based on this evaluation conducted by Finn Stevenson, in 2017 the Department of Education for New York City expanded the Mutt-i-agrees curriculum and programming to 30 more schools in their jurisdiction (Algar, 2017). Although the evaluation results for this program were very positive, Finn-Stevenson, the lead researcher, has yet to publish the results in any peer-reviewed journal. The widespread use of this program as well as its organized curriculum and structure may one day lead other researchers to use these settings to examine aspects of the use of ESD in elementary classrooms

Left unaddressed, anxiety and other internalizing behaviors can exacerbate the probability of students not completing high school, being socially maladjusted, or turning to drugs. The research results indicated that the use of dogs in classrooms mitigates anxiety and allows students to relax and succeed in the classroom. Addressing anxiety early in a student's academic career can allow students to learn the skills they need to manage internalizing difficulties and therefore help them to create positive change within themselves, which will ultimately benefit the community. Often when kids are anxious, symptoms of depression can occur comorbidly and therefore, in the next section I looked at the links between depression in children and the use of ESD.

Links Between Depression in Children and Emotional Support Animals

Symptoms of depression vary amongst populations and are uniquely influenced by the age of the person. The research by Mullen (2018) suggested that children as young

as 3 have been examined and diagnosed with a form of depression. The research findings also suggested that children 3-8 years of age do not have the emotional language to articulate their situation and therefore meeting the criterion for depression in the *Diagnostic Statistics Manual (DSM) 5* is not a possibility.

The Centers for Disease Control and Prevention (2018) suggest that the frequency of depression is 0.5% for children between the ages of 3 to 5 years, 2% for those between 6 to 11 years, and for those in the adolescent years between 12 and 17 years, 12%. Mullen (2018) reported that depression in the age group of 3-8 years of age is best explored through the frequency of somatic concerns, ongoing complaints, anxiety related symptomology, and behavioral challenges. Kamphaus (2015) suggested that the BASC-3 TRS items reflect the age appropriate symptomology for anxiety, depression, and somatization. The literature stated that 2% of children in the age range of 6 to 11 years will have clinical depression; this population was captured in my study through the internalizing subscale of the BASC -3 TRS.

The NIMH (2019) stated that 13.3% of adolescents between the ages of 12 to 17 will have had a minimum of one severe depressive episode, however, many of these teens will go untreated (Ebert, 2015). Interestingly, there are over twice as many depressed female adolescents than males (NIMH). Because the symptoms of depression come with the onset of adolescents (NIMH), effectively recognizing it and offering timely treatment can be difficult (Dietz, Davis, and Pennings, 2011). Depression could be misunderstood or go unidentified, as teenagers are known to sleep too long, hang out in their bedrooms, and interact with their families on a minimal basis.

Karlene, Wilke, Milbourne and Theule (2018) conducted a meta-analysis on the efficacy of animal-assisted psychotherapy, trauma with symptomology including depression (Karlene, Wilke, Milbourne, and Theule, 2018). In this study, the authors examined the pre/post affects using eight qualitative studies. The researchers found that there was a small to moderate effect size. As such, the researchers concluded from their meta-analysis that the use of dog therapy for people suffering from trauma symptoms, including depression, was an effective form of treatment.

Depression encompasses feelings of being sad or unhappy and how these emotive factors impact the quality of an individual's daily life (Reynolds and Kamphaus, 2015). There has been little research on the direct effect of dog programs on children suffering from depression. However, Dietz, Davis, & Pennings (2011) investigated 153 children who ranged in age from 7 to 17 and suffered from mental health concerns brought on by sexual abuse. The study used three different therapeutic approaches and two of the approaches involved therapy dogs. The results of this study indicated that the groups that included the therapy dogs showed an overall significant reduction in trauma symptoms such as depression.

Although they were not in a school setting, a study in a hospital using twenty-four pediatric oncology patients, with a mean age of 8 years of age, were engaged in dog therapy sessions. The sessions occurred three times per week for 30 minutes per session. The findings of this study indicated that there was an improvement in depressive symptoms in pediatric patients (Silva and Osorio, 2018). In a further study in pediatric

oncology (Bouchard, Landry, Belles-Isles, and Gagnon, 2004) found that parents reported that by having a dog present their child was able to gain confidence and was happier.

Even though these findings from these studies seem promising, further research is still needed. Due to the scarcity of research in this area, it is not practical to draw overall conclusions as to whether the use of dogs to reduce depression in youth will be an effective practice. Future research may give us a more definitive perspective. Further, the field will benefit from research that focuses on depression, as opposed to signs of depression seen through the symptoms of trauma. However, the research indicated that the frequency of depression in children 6 to 11 years of age is 2% (Center for Disease Control and Prevention, 2018) and this issue was compounded in these children because they lack the emotional vocabulary to give voice to their mental state. As such, many of these students will go unidentified within the classroom environment. Both Dietz et al. (2011) and Silva and Osorio (2018) concur that the use of ESD can positively impact a child in a depressive mood. Whether the child has had a formal diagnosis of depression or not, it appears that a dog's presence in these situations could be beneficial. The pre and post comparative information in this study will add to the body of literature in this area.

Links Between Somatization in Children and Emotional Support Animals

One area of investigation I studied was the somatization rates in children and the impact from exposure to an ESD in school. Somatization is a concept that examines how physically sensitive an individual is (Reynolds and Kamphaus, 2015). Additional factors examined include the level of complaining that accompanies minor aches and pains, and the future tendencies of possible illness or health related concerns (Reynolds and

Kamphaus). Although the definitions of somatization are clear, the research in the field is not as clear.

An exhaustive review of the literature regarding children, somatization, and therapy dogs has not brought forward any specific research, although, Neil and Smith (2017) may present part of an explanation. The study they conducted looked at whether teachers could distinguish between students who had anxious or somatic symptomology. The researchers investigated 1,346 student who were in the age range of 7 to 11 years of age, as well, 51 teachers and 144 parents. Within their study, Neil and Smith collected data on anxiety and somatic symptoms. The findings of the study suggested that teachers were not overly sensitive in identifying the levels of their student's anxiety or somatic symptomology; therefore, teachers may have a difficult time identifying students who would benefit from additional support or intervention in these areas.

Given the findings from Neil and Smith (2017), it could be suggested that the use of an emotional support dog for students with anxiety may also assist those students who have somatization. Further, Neil and Smith suggested that we cannot wait for teachers to refer children who have anxious or somatic symptomology. The BASC-3 TRS subscales allow the differentiation between anxiety, depression, and somatization, giving an accurate picture of how students' scores change within each scale, as the result of the intervention. This will help to further distinguish anxiety and somatization as well as identifying students who are struggling with internalizing difficulties. As Reynolds and Kamphaus (2015) pointed out, most young students cannot articulate how they are feeling and the first way in which they convey these internalizing challenges is through a

somatic response. This response may be ignored or misinterpreted by the classroom teacher (Neil & Smith, 2017) and may not get the student the support or understanding that is needed. The use of an ESD program in the classroom may have a positive impact on the student with somatic concerns by addressing their emotional needs that perpetuates emotional regulation and personal growth. An ESD program that has consistency as well as defined terms, goals, and objectives is integral to student support and academic success (Friesen, 2010).

Limitations With Current Research

Although there has been an increasing amount of research in this field in the last few decades with respect to the implications of animal support therapy, there has been much concern amongst researchers about how the studies have been conducted. Researchers cite small sample sizes, and inconsistent definitions of terms and data collection techniques, to name a few. These results call into question the reliability and validity of previous findings and assumptions (Crossman, 2016). An example of this was a meta-analysis that was performed on animal-assisted therapy by Maujean, Pepping, and Kendal (2015). Maujean et al. examined 66,180 studies and after excluding studies that did not meet their inclusionary criteria, that is, they had small sample sizes or inconsistent operational definitions; the authors found that only eight studies remained.

As far back as 2013 there has been an ongoing concern regarding the consistent use of operational terms and definitions within the field for dogs involved with emotional support, service, or therapy. Without a consensus amongst researchers on the operational terms and definitions, examining and interpreting research findings becomes

comparatively difficult. Recently many researchers (American Psychological Association, 2016; Schoenfeld-Tacher, 2017; Schoenfeld-Tacher & Kogan, 2017) have attempted to formalize definitions to be used by researchers in this field and these definitions are used in my study. Relatedly, Crossman (2016) also contended that this lack of consistency in operational terms has compromised our current methodological practices. This is echoed by Crossman who further suggested that the lack of rigorous and consistent methodological approaches has made the human-animal interaction (HAI) research fall behind in supporting the extensive use of dogs in our supportive service communities. Crossman further argued that there is a paucity of quantitative research in this field but its synthesis cannot determine whether the positive effect of HAI can be extended to companion or emotional support animals. Further Crossman contents that future research needs to focus on quantifiable methods, which include research that uses a pre/post model of exploration. My study fills this research gap by contributing findings utilizing a quantitative pre/post methodological approach. As well, I used comparison groups ("control" and "treatment") and operation terms/definitions that are now beginning to be adopted by the research community in this field.

Summary

Humankind's companionship with dogs started when we were hunter-gathers (Freedman & Wayne, 2017) and was initially forged through a symbiotic convenience that gave humans protection and dogs a meal and shelter. Over time, experience, and the evolution of the canine species, the human/dog bond eventual flourished into a rich relationship. The theory behind the HAB has produced a significant amount of related

literature in the last 3 decades yet there is still debate about its theoretical definitions (Bayne, 2002; Davis & Balfour, 1992; Russow, 1999; Zinn & Beck, 2014). Despite this, 3 decades of research indicate that ESA, particularly dogs, have a positive effect on mood, mental health, and quality of life on people (Crossman, 2016; Nimer & Lundahl, 2007). Research further indicates that the prosocial relationship developed between a dog and the human companion can be transferred to new settings such as a classroom (Anderson & Olson, 2006; Beetz, Turner, & Kotrschal, 2012; Hergovich, Monshi, Semmler, & Zieglmayer, 2002; Kortschal & Ortbauer, 2003; Rud & Beck, 2002; Younggren, Boisvert, & Boness, 2016). Research further suggests that having a dog building relationship in a school classroom can reduce aggressive acts and nurture empathy (Ascione, 1992; Daly & Morton, 2006; Davis & Juhasz, 1995; Kens, Stuart-Parrigon, & Coifman, 2018; McNicholas & Collins, 2001). In spite of all the positives associated to having dogs in schools there are also negative factors that must be addressed.

A variety of concerns have been put forth regarding having dogs in classrooms. Many of these concerns are around cleanliness, student safety, health ramifications caused by allergies, and legal liability. The research in this area indicates that the majority of these factors can be resolved by awareness, sensitivity, preplanning, dog selection and dog training (Daly & Suggs, 2010; Schonenfeld-Tacher, 2017; Von Bergen, 2015). Research further indicates that the potential consequences of legal liability has more to do with district policy awareness and procedural follow through (Daly & Suggs, 2010; Hergovcih, Moshi, Semmler, & Zieglmayer, 2015). As well, methodological

concerns have arisen from current literature. Past and current research in this field has been hampered through the lack of consensus with operational terms and definitions, small sample sizes, and inappropriate methodology (American Psychological Association, 2016; Crossman, 2016; Schoenfeld-Tacher, 2017; Schoenfeld-Tacher & Kogan, 2017). In my research, I addressed these shortcomings and advance knowledge in the field of animal assisted therapy as it pertains to assisting children in schools with anxiety, depression, and somatization.

The goal of my study was to add an approach and finding which was consistent with the currently evolving standards and procedures within the field. Crossman (2016) suggested that the big findings in this will not come from just on study but will be contingent on many well-done pieces of research. With Crossman's findings in mind, I will discuss and detail my study in Chapter 3.

Chapter 3: Research Method

Introduction

Within the last few years, there has been a growing trend for educators in school to use the presence of dogs in classrooms to positively enhance the emotional and social well-being of students (Algar, 2017). Unfortunately, there has been a paucity of quantitative data to support or establish the benefit of this practice (Crossman, 2016; Fujisawa et al., 2016; Lieber 2000; Ryan, 2002). The question as to whether the presence of an ESD has an impact on specific measures of mental health, such as anxiety, depression, and/or somatization, has not been examined with a quantitative methodological approach. Therefore, in this study I used archival data and a quantitative approach to determine if the presence of an ESD affects anxiety, depression, and somatization symptoms, as measured by the BASC-3 TRS, of elementary students who were designated as having mental health concerns and emotional/behavioral disorders.

In this chapter, I discuss the research methodology with enough specificity that any researcher wanting to replicate this approach will find the task a reasonable one. I provide explanations of the selection of the research design, its connection to the research questions, the limitations of this design due to time and resources, and how this choice in design advances the knowledge in this area of study. Other aspects of this study addressed in this chapter are a description of the selection methods for the target population, data collection and its use, validity, and ethical procedures. Finally, I conclude the chapter with a short summary.

Research Design and Rationale

In this study, I used archival data from a program in which support dogs were introduced into the classroom for elementary students (aged 6 to 11 years old) from 2017–2018. The first independent variable was time as a repeated measure and a two-level component: pre- and posttreatment. The second independent variable was the exposure or nonexposure to the ESD program. The dependent variables were the subscale scores for anxiety, depression, and somatization as measured by the BASC-3 TRS.

In this study, I had the identifiable treatment comparison groups of control and treatment for the purpose of analysis. The treatment group was made up of students who were previously identified as having mental health difficulties, had a BASC-3 TRS on file that was rated by their classroom teacher, met criteria for a Category H designation by the district behavior specialists who scored and interpreted the BASC-3 TRS, and were exposed to the ESD program for 2 hours per week for 24 weeks. The control group was made up of students who were identified as having mental health difficulties, had a BASC-3 TRS on file that was rated by their classroom teacher, met criteria for a Category H designation by the district behavior specialists who scored and interpreted the BASC-3 TRS, and did not have access to the ESD program in their classrooms. The BASC-3 TRS was completed on all children in the study before the ESD program was implemented in the treatment group, and again 6 months after implementation of the program. The district behavior specialists then produced a chart containing only students' scores for anxiety, depression, and somatization. For the purpose of this study, these were the data analyzed.

I used a 2 x 2 factorial ANOVA method to establish whether the ESD program had a significant effect after the 6-month period on anxiety, depression, and somatization scores as measured by the BASC-3 TRS. This was demonstrated by the existence of a significant interaction effect between the within-subjects component (i.e., pre- and post-measures) and the between-subjects component (i.e., being exposed or not to the ESD). The school district possessed this archival data but had yet to analyze it to determine if the ESD program was in fact having an effect on student scores in the areas of anxiety, depression, and somatization.

School District's Emotional Support Dog Program

In this study, ESDs were defined as dogs that have been identified by the school district as being behaviorally appropriate and safe in a school environment. A district-wide certification process has been established and implemented for the dogs, which was adopted from the Canine Good Neighbor Program produced by the Canadian Kennel Club (2006). This program includes 12 tests where the dog has to demonstrate confidence and control to complete each of tests without showing any signs of shyness or aggression. Certification is complete once the dog has mastered the 12 tests.

The ESD program in the school district used ESDs in 28 classrooms across 14 schools for 6 months. A dog was in the classroom for two 2-hour sessions per week for 24 weeks. The decision as to whether a classroom would have the ESD program was a district decision, based on a variety of factors, including allergies, student's fear of dogs, and teacher preference. In this study, I aimed to provide evidence-based findings to help the school district make their decisions on whether this is a viable intervention.

Methodology

As in many school districts, the student population of the district under study is ethnically diverse and includes families from all socio-economic statuses. I used archival data collected from 14 elementary schools. Within the 14 elementary schools, the district collected data from 14 treatment classrooms that used the ESD program and 14 control classrooms that did not use the ESD program. The archival data that I received consisted of 34 students in the treatment group and 34 students in the control group; all students had a BASC-3 TRS completed as part of the school district's designation process for Category H (i.e., children with mental health concerns) students. The archival data included BASC-3 TRS scores from both the treatment and control group taken before the intervention started and 6 months after the intervention was in place.

Students Identified as Category H

The Category H designation serves two major purposes in the province of British Columbia, Canada. The first purpose of this designation was for creating a funding source. If the student met the criterion set forth by the British Columbia Ministry of Education (2016), the school district received $10,240 toward additional support for the student. The second purpose of this designation was to facilitate the distribution of funds by the school district to schools for enhancing student support. An important aspect of receiving these funds from the Ministry of Education was to provide additional services and support for designated students. This data collection was ongoing and used to help support program development including creating an individual education plan and

ensuring the interventions were implemented to address the deficits identified in the BASC-3 TRS.

The students that were identified as Category H in both the treatment and the control classrooms attended mainstream educational classrooms with their same aged peers (i.e., 6 to 11-year-olds). The difference between a student coded as Category H and other students was that the teacher and school district personnel monitored the Category H student's behavior, mood, and educational programming. As part of the Category H criterion, the ministry asked that a standardized behavioral evaluation in the form of the BASC-3 be included in the student's file and that subsequent behavioral evaluations and monitoring occur (Government of British Columbia, 2016).

Population

To conduct this study, I obtained archival data from a school district in the southern interior of the Province of British Columbia from the Superintendent's Office after having been collected and all student and school identifiers removed by the Student Services Department. The populations in these 14 schools varied in socio-economic status and ethno-diversity. This school district drew its students from three separate municipalities and had a student population of approximately 8,000 students. Of these students, 2,989 were 6 to 11 years of age within the school district. In the 2017–2018 school year, 92 elementary aged children were coded as Category H students, although not all of these 92 students had an ESD program within their classroom. I was only able to obtain data on 68 out of the 92 students who were coded as Category H, which was due to school or classroom movement or lack of parent consent. All the archival data I

received from the district, which included data from 34 students in the treatment group and 34 students in the control group, were used in this study.

Sampling

In this study, the treatment group consisted of 34 students who were between the ages of 6 and 11, met the British Columbia Ministry of Education criterion for Category H, and were in elementary classrooms in the 2017–2018 school year that used the district's ESD program. The control group consisted of 34 children aged 6 through 11 years old, who met the British Columbia Ministry of Education criterion for Category H, and were in elementary classrooms not using the district's ESD program.

The sampling process took place at the district level, and I was not a part of it. The 68 students analyzed in this study from the control and treatments groups were within 28 classrooms across 14 schools and randomly chosen by the district.

The students in the treatment comparison groups (i.e., control and treatment) were in regular classrooms with general education students; however, within these classes, the school district had identified some of these students as having mental health difficulties and meeting criteria for the British Columbia Ministry of Education Category H designation. Although examples of diagnoses that could meet criteria for a Category H designation include anxiety disorders, depressive disorders, and posttraumatic stress disorders, I want to make it clear that the designation is for identification for educational programming and support as opposed to a clinical diagnosis.

Procedures for Recruitment, Participation, and Data Collection

Once I received permission from the Institutional Review Board at Walden University, I requested permission to obtain and analyze the district's archival data from the superintendent of schools. The school district generated a number to identify the student data so the data could be matched through the pre- and postanalysis; this analysis was performed for both treatment comparison groups. By generating a number, I was able to ensure that I had the same student identified in the pre- and posttreatment data. The premeasure was collected by the district prior to the implementation of the ESD program for both the treatment and the control group. The post measure was taken 6 months after implementation of the ESD program for both the treatment and control group. Because I was using archival data, parental consent to allow teachers to complete rating scales on their children was already obtained by the school district as part of their Category H designation process. Additionally, within the same process, the school district obtained consent to analyze the student data anonymously.

As part of the British Columbia Ministry of Education process for funding students in their Category H, Severe Behavior and Mental Health (see Appendix), the criterion included meeting behavioral or diagnostic criteria and having a behavioral rating instrument that is regularly reviewed as part of the procedural process. In this school district, the instrument used is the BASC-3 TRS, a Level B assessment, that requires the assessment to be scored and interpreted by an individual with a Master's degree in an appropriate field and specific training in this assessment tool. Therefore, the school district had the BASC-3 TRS completed by classroom teachers of students who were

identified for a Category H designation. The BASC-3 TRS was filled out by the classroom teacher, who had known the student for at least 3 months. The BASC-3 TRS was then scored and interpreted by the district behavior specialists.

In this study, I was given archival data collected by the school district, both pre- and posttreatment, for the treatment comparison groups (i.e., control and treatment) happening during the same time interval. The treatment group had access to the ESD program in their classrooms while the control group did not. The classroom teacher completed the BASC-3 TRS rating scale for each identified student twice, 6 months apart. The district behavior specialists, qualified in Level B testing, then scored and interpreted the data. The data for this study were collected from the first round of intervention with the ESD program, which occurred in 2017. Data were collected prior to the inception of the program and 6 months after inception in 2018.

Instrumentation and Operationalization of Constructs

In this study, I used the anxiety, depression, and somatization subscales from the Behavior Assessment System for Children, Third Edition BASC-3 Teacher Rating Scale (TRS) (Reynolds & Kamphaus, 2015). In the following section, I discuss the BASC – 3 TRS assessment and its various components, the BASC-3 TRS, its applicability to my research questions, and information about reliability and validity of the BASC-3 TRS.

Behavior Assessment for Children BASC-3 TRS

The BASC-3 TRS was originally introduced in 2015 and is currently used as a measure to evaluate internalizing and externalizing problems, behavioral symptoms, and adaptive skills in children between the ages of 2.5 to 18 years (Reynolds & Kamphaus,

2015). The BASC-3 TRS is primarily used in educational and clinical settings to assess and monitor children and youth with mental health difficulties.

The BASC-3 TRS contains 156 items that are broken down into 15 subscales. These subscales have been standardized to use with preschoolers (two to five years of age), children (6 to 11 years of age), adolescents (12 to 21 years of age), and college students (18 to 25 years of age). I used 3 of these subscales in this study; these subscales included anxiety, depression, and somatization. Reynolds and Kamphaus provide extensive information on the use and limitation of the BASC-3 TRS rating scales (2015). These rating scales were available in paper and electronic form as was the scoring materials. Within this study, the BASC-3 TRS for children ages 6 to 11 was used.

The BASC-3 TRS uses a 4 point Likert rating system. Items on each scale are tallied to provide a scaled score, which is then converted into a t-score. Any score over 60 is considered above the normal range for the internalizing behaviors of anxiety, depression, and somatization. If the scores are in the 61 to 70 range, the student is considered at-risk for that particular subscale, and scores above 70 are considered to be clinically significant for that subscale. The BASC-3 TRS, rating scale takes approximately 15 to 20 minutes for the classroom teacher to complete (Glascoe & Marks, 2011).

The BASC-3 TRS was standardized in the United States with children ranging from the ages of two to 25 years. To create the normative data for the BASC – 3 TRS, 1,700 students from the ages of two to 18 were examined. There are three validity indices that are investigated in the TRS; these include the F index which determines whether a

respondent was overly negative in their responses; the Response Pattern Index which identified whether the respondent was inattentive to the item content or used repetitive patterns in their responses and the Consistency Index which measured whether respondents answered similar questions in a consistent manner (Reynolds & Kamphaus, 2015).

Reliability

The coefficient alpha reliabilities that are associated with the Clinical Indexes of the TRS are .92 for 6–7-year olds, and .93 for 8-11-year olds (Reynolds 2015). The coefficient alpha reliability of the overall composite score, internalizing difficulties, is .96 for 6 to 7-year-olds and .96 for 8 -11-year-olds. The subscales that were used in this study also demonstrated reliability. Specifically, the alpha for the anxiety subscale using combined gender was .86. The alpha for the combined depression subscale was .86, and the alpha for the combined somatization subscale was .87 (Kamphaus, 2015).

The test-retest reliability for 6 to 11-year-olds was .86 for clinical indexes and .87 for composite. The interrater reliability for 6 to 11-year-olds is .67 for clinical indexes and .68 for composites. Kamphaus (2015) did not break down the test-retest reliability for 6 to 11 year olds for anxiety, depression, and somatization, nor did he break down the interrater reliability for the subscales anxiety, depression, and somatization. The test-retest reliability and the inter-rater reliability given by Kamphaus reflect the entire BASC-3 TRS assessment and not specific to the composite scores I address in this study.

Validity

The Intercorrelations Structure of scales and composites was based on factor analyses of items and scales. Content Concurrent Groups of children with preexisting clinical diagnoses tend to have distinct BASC–3 profiles. There is no predictive validity. The clinical norm sample is composed of children ages 4 through 18 identified with a diagnosis or classification of one or more emotional or behavioral problems. In many cases, these children were receiving special-education services at school, a community mental health clinic, or a university- or hospital-based mental health clinic. Children with a variety of emotional, behavioral, and physical problems were targeted for participation. Extensive research on the BASC-3 TRS continues to show that this instrument has good validity (Merenda, 1996; Oehler-Stinnett & Boykin, 2001; Roth, Erdodi, McCulloch, & Isquith, 2015).

Professionals in the education setting use the BASC-3 TRS as it differentiates between emotional and behavioral problems. Given the ease of administration and the amount of time it takes to administer, the BASC-3 TRS can and is used as a pre-post design to determine if programming and interventions are successful (Reynolds & Kamphaus, 2015).

In this study, I used the BASC-3 TRS as it has been found to be a reliable and valid tool to discern changes in emotional and behavioral difficulties in children. Further, this tool has been well researched and the reliability and validity has remained consistent. The BASC has also been identified by the Ministry of Education as an appropriate measure to determine whether students meet criteria for a Category H designation and

therefore, their districts receive additional funding to implement programs and strategies to assist the student to be successful in mainstream educational classes (Government of British Columbia, 2016).

BASC Subscales

The operationalization of definitions within a study was an important aspect of the study as it defined how the concepts being studied were measured. For the purpose of this study, I had three constructs, the dependent variables, that needed to be defined and operationalized; these included the concepts of anxiety, depression, and somatization.

Anxiety Subscale

The BASC-3 TRS anxiety subscale consisted of 9 items that used the DSM-5 diagnostic criteria to draw on the sample of questions. If students score under 60, then they were considered to be typically functioning for anxiety. If students scored between 60 and 70, they were considered to be at risk for anxiety, and if students score over 71, then they were considered to be in the clinically significant range for anxiety (Reynolds and Kamphaus, 2015). Reynolds and Kamphaus (2015) suggested that individuals with a clinically significant anxiety scale score might experience obtrusive or unwanted thoughts as well as possibly a sense of dread. Examples of the anxiety scale questions included in the TRS are “Is fearful” and “Is easily stressed”. Those with an elevated Anxiety scale score might have difficulty in decision-making and respond negatively to events in their environment.

Depression Subscale

The 11 depression scale sampling questions were produced using the description and criteria for depression as outlined in the DSM-5 (Reynolds & Kamphaus, 2015). If students scored under 60, then they were considered to be typically functioning for depression. If students scored between 60 and 70, they were considered to be at risk for depression, and if students scored over 71, then they were considered to be in the clinically significant range for depression (Reynolds & Kamphaus, 2015). The traits that were associated with depression included a sense of social isolation, no enjoyment in doing things, and a sense of hopeless or dread. Those students that scored clinically significant on the depression scale were described as introverted, anxious, and potentially agitated (Reynolds & Kamphaus, 2015). Reynolds and Kamphaus (2015) found that those students who had the highest scores on the Depression scale usually were students with emotional behavioral disorders or had autism spectrum disorder. Examples of the depression scale questions included in the TRS were “Says nobody likes me” and “Cries easily”.

Somatization Subscale

The Somatization scale in the BASC-3 TRS consisted of 8 items and was consistent with the descriptors for the somatization in the DSM-5 (Reynolds & Kamphaus, 2015). If students scored under 60, then they were considered to be typically functioning for somatization. If students scored between 60 and 70, they were considered to be at risk for somatization, and if students scored over 71, then they were considered to be in the clinically significant range for somatization (Reynolds & Kamphaus, 2015).

There was an association between trauma and children with physical complaints; children who were identified as having trauma typically had a heighted sense of physical ailments and/or somatic complaints (Bae, et al., 2018). It was suggested by Reynolds and Kamphuas (2015) that if the scores on the BASC-3 TRS somatization scale were in the clinically significant range, the anxiety and depression scores should also be examined, which I did in this study. The interrelatedness of somatization to other clinical symptoms is an important factor in the evaluation and interpretation of the somatization scale score (Reynold & Kamphaus, 2015). Examples of the somatization scale questions included in the TRS are "Complains of pain" and "Is afraid of getting sick".

Data Analysis Plan

Before defining the appropriate statistical method to test the hypotheses of this study, the level of measurement of the variables was examined. The rating scale was composed of 156 affirmative statements representing emotional and behavioral symptoms). Although I only examined the scores for anxiety, depression, and somatization, the teachers did complete the entire rating scale. In this study, the classroom teacher was asked to mark the perceived frequency of each child's corresponding act using a 4-point Likert-scale labeled 'Never', 'Sometimes', 'Often' and 'Almost Always'. Each response was coded from 0 to 4. Computer scoring of the questionnaire determined the student's corresponding scores for anxiety, depression, and somatization and whether those scores were average for a student their age, or indicated they were at risk or have clinically significant levels of anxiety, depression or somatization.

The rating scales were completed by the district for the treatment group (children who received the emotional support dog intervention) and the control group (children who did not receive the intervention). Both groups were assessed twice on the BASC -3 TRS rating scale by their teacher, once prior to the implementation of the program and the second time was six months later; the District Behavior Specialists collected and scored the results. Osborne and Waters (2002) suggested the use of a 2x2 factorial ANOVA method would be an appropriate choice when a study is using a continuous dependent variable that has two or more discrete variables that are measured two times or more.

The 2x2 factorial ANOVA method yielded the following results:

- Whether or not being treated by an emotional support dog had an effect on anxiety, depression, and somatization;
- Whether or not there were differences between pre and post-treatment scores of anxiety, depression, and somatization.
- Whether or not there were significant interaction effects. That is, if the difference between pre/posttreatment scores was significantly different among treatment and control groups.

Pallant (2010) states that mixed designs are appropriate when the researcher wants to combine two approaches: a within-subjects design with a between-subjects design. Within the scope of this study, the between-subjects design was relevant to compare the treatment and the control groups. The within-subjects design, on the other hand, was appropriate to test the differences of each group in respect to different times

(pre and post treatment). As the interest of this research was to compare the relative effect of the support dog exposure on anxiety, depression, and somatization between both groups for pre/posttreatment, a 2x2 factorial ANOVA method was an appropriate test.

Each research question addressed one of the three behavioral symptoms assessed by this study: anxiety, depression and somatization. A single analysis was performed using the 'General Linear Model' of Statistical Package for the Social Sciences (SPSS) (Repeated Measures submenu), The two levels of each IV were entered along with the three dependent variables (anxiety, somatization, and depression). Before performing the 2x2 factorial ANOVA method, it was important to comment on the assumptions of normality, homoscedasticity, absence of multivariate outliers, and sphericity.

The assumption of normality was assessed using a Q-Q scatterplot (Bates, Mächler, Bolker, & Walker, 2014; DeCarlo, 1997; Field, 2013). Normality was tested using skewness/kurtosis and Shapiro-Wilk's test, which was far more robust than examining the Q-Q scatterplot.

To examine sphericity I used Mauchly's test (Field, 2013; Mauchly, 1940). This test examined whether or not there are significantly different variances on the differences between different levels of repeated measures. Because I had just two levels of repeated measures (before and after) there was only one set of differences scores and nothing to compare those differences against to indicate violation of sphericity. Further, the F- Test was used and the findings of that process yielded the main effect and the general differences within-subjects and between-subjects.

Multivariate outliers were assessed using Mahalanobi's distances. Outliers were only eliminated if there was sufficient evidence that the observation was not valid. Homoscedasticity was assessed through Levene's tests for equality of variances. As well as examining sphericity, I also examined differences within the 2x2 factorial ANOVA. By using a significance level of $\alpha = .05$, the F-test was used and the findings of this process yielded the main effect size and the general differences within-subjects and between- subjects.

Outliers were only eliminated if there was sufficient evidence that the observation was not valid (Hair, Black, Babin, & Anderson, 2014). Each research question addressed one of the three behavioral symptoms assessed in my study: anxiety, depression and somatization. A single analysis was conducted with the three dependent variables, anxiety, depression, and somatization. As outlined in Chapter 1; the research questions I explored are outlined below:

RQ1: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' anxiety scores as measured by the BASC-3 TRS?

H_a1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1b: The time lapse between the pre- and posttreatment measures has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1b: The time lapse between the pre- and posttreatment measures has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1c: The interaction between pre- and posttreatment anxiety scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$1c: The interaction between pre- and posttreatment anxiety scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ2: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old student's depression scores as measured by the BASC-3 TRS?

H_a2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2b: The time lapse between the pre- and posttreatment measures has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2b: The time lapse between the pre- and posttreatment measures has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2c: The interaction between pre- and posttreatment depression scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$2c: The interaction between pre- and posttreatment depression scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ3: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect in 6- to 11-year-old student's somatization scores as measured by the BASC-3 TRS?

H_a3: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3b: The time lapse between the pre- and posttreatment measures has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3b: The time lapse between the pre- and posttreatment measures has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3c: The interaction between pre- and posttreatment somatization scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$3c: The interaction between pre- and posttreatment somatization scores is not significantly different between the group that was exposed to an ESD and the group that was not.

Threats to Validity

Internal validity refers to the effects of an experiment being caused by the experiment itself and not by other random factors, while external validity is related to whether or not the findings of a study can be generalized to its inferential population (Andres, 2018).

Kirkwood and Price (2013) suggested that in order to examine and determine validity of a study the researchers must be aware of the potential limitations of that study. In this study, I am limited to a rather small sample size of 68 students due to the number of emotional support dogs (one per classroom) and the number of British Columbia Ministry designated as Category H students. This can make the generalization of the

results difficult and therefore be a threat to external validity. Another limitation was the scrutiny of the data collection process; this was a school district initiative and the data were compiled by district behavior specialist. Because I was not involved in this process, I cannot speak to whether the procedures and protocols were consistent, which represents a threat to internal validity. Further, the size and regionality of the sample may make generalization difficult beyond the identified population. As has been suggested by Crossman (2016), even among researchers in this field, the definitions of the types of dogs used in the accompaniment of students and the public are not clear or consistently used.

Ethical Procedures

In this study, I ensured that I followed the ethical principles that had been laid out by the American Psychological Association, further, provincial and federal requirements were followed. The archival data I collected already existed. Prior to handing over the data, the school district followed a strict protocol to ensure privacy and confidentiality of all the data. Before releasing data to me, all personal identifiers in this archival data were removed by the school district, including the school, teacher, and student names for both the treatment comparison group data sets. All the data is stored on my computer, which was encrypted, and I was the only person with the password. From the date I was given the data, the data will be stored for 5 years on an encrypted file server at my home office; I am the only person who will have access to this data. At the end of 5 years, I will erase the data and no electronic or physical copies will be kept.

Summary

Although there has been a popular trend to use dogs in classrooms over the last couple of decades (Fujisawa, Kumasaka, Masu, & Kataoka, 2016), most of the research relies on qualitative methods to establish the benefits of this practice (Crossman, 2016; Fujisawa et al., 2016; Lieber 2000; Ryan, 2002). In this study I used a quantitative methodological approach to examine the pre and post anxiety, depression and somatization scores of elementary students on the BASC -3 TRS; scores were examined for two groups of students, one group that has had access to an ESD Program in school and one that had not. The BASC-3 TRS was initially administered to these students for the purpose of coding them for funding through the British Columbia Ministry of Education. The posttest scores were gathered by the district to determine if the implementation of an ESD program would have its intended impact.

The BASC-3 TRS was used for this study due to its ability to service a broad range of professional settings such as counseling, behavior, and research (Reynolds, 2015). The BASC-3 TRS was created to measure adaptive and maladaptive behavior in children and youth from 2.5 years to 25 years of age. Although the BASC – 3 TRS has scales that determine internalizing behaviors, externalizing behaviors, school problems, behavioral symptoms index and adaptive functioning, the scope of this research was focused on the students internalized scores only.

As mentioned earlier, I conducted a 2x2 factorial ANOVA method to examine the significance of pre/post treatment differences among the treatment comparison groups, (“control” and “treatment”). It has been suggested that (Osborne & Waters, 2002) the use

of this statistical process is appropriate if the study is using continuous dependent variables that are measured two or more times for two or more groups.

Crossman (2016) suggested that many of the quantitative and qualitative studies in this field suffer because of small sample size and inconsistent definitions across the discipline. In this study, I met the sample size criterion for medium effect size; however, the regionality of the study might make its generalization difficult. In spite of these limitations this study has the potential for positive social change by providing school districts with a much needed universal low-cost intervention that could assist students who struggle with anxiety, depression, and somatization. Further, not only could this intervention assist those who struggle, it may also act as an early identification and intervention process for students with social and emotional struggles.

I concluded this chapter by discussing ethical procedures. I have laid out all the ethical principles for keeping the integrity of the study. School district personnel only provided redacted information; any personal or public identifiers were removed and I was provided with a list of pre/post scores for 34 students in the treatment group and 34 students in the control group. I do not have any knowledge of who the participants were within the study. In Chapter 4, I will be discussing results of the data analysis process and findings.

Chapter 4: Results

Introduction

Although the dog/human bond is still used in clinically guided and supervised approaches, a trend toward the introduction of ESDs within school settings has occurred. These school-based dog programs have been developed and overseen primarily by school districts and are gaining popularity within education (Grajfoner et al., 2017). These programs have also created controversy within the research field regarding program efficacy (Harrington, 2015; Hergovich, 2012; Kems et al., 2018).

The purpose of this quantitative study was to conduct an archival data analysis to determine if the presence of an ESD in the classroom was associated with changes in teachers' ratings of students' scores for anxiety, depression, and somatization behaviors as assessed by the BASC-3 TRS. The archival data were collected by school district staff over a 6-month period after teachers filled out the rating scale for students in their class who were identified as having an emotional or behavioral disorder.

The following research questions and hypotheses guided this study:

RQ1: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' anxiety scores as measured by the BASC-3 TRS?

H_a1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1b: The time lapse between the pre- and posttreatment measures have a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1b: The time lapse between the pre- and posttreatment measures have no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1c: The interaction between pre- and posttreatment anxiety scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$1c: The interaction between pre- and posttreatment anxiety scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ2: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' depression scores as measured by the BASC-3 TRS?

H_a2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2b: The time lapse between the pre- and posttreatment measures has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2b: The time lapse between the pre- and posttreatment measures has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2c: The interaction between pre- and posttreatment depression scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$2c: The interaction between pre- and posttreatment depression scores is not significantly different between the group that was exposed to an ESD and the group that was not.

RQ3: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' somatization scores as measured by the BASC-3 TRS?

H_a3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3b: The time lapse between the pre- and posttreatment measures has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3b: The time lapse between the pre- and posttreatment measures has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

*H*a3c: The interaction between pre- and posttreatment somatization scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$3c: The interaction between pre- and posttreatment somatization scores is not significantly different between the group that was exposed to an ESD and the group that was not.

In this chapter, I examined the process involved with the data collected by the school district and any discrepancies that occurred that were not as I had previously described it in Chapter 3. I also presented the outcomes of all the statistical analysis used in this study. Finally, I concluded the chapter with a summation of the data analysis and how it relates to the research questions as well as how these findings add to current trends and the existing body of literature in this field.

Data Collection

The archival data for this study came from the TRS of three internalizing subscales of the BASC-3 (i.e., anxiety, depression, and somatization) of students identified as having an emotional or behavioral disorder. The data was collected twice. The preintervention scores were completed prior to the inception of the ESD program (and during the same time frame for the control group; i.e., the group that did not have access to the ESD program). The postintervention scores for anxiety, depression, and somatization were taken for both the control and treatment groups after the ESD program had been in the treatment classrooms for 6 months.

The data for this study were collected during the 2017–2018 school year. Initially, district staff obtained parental consent for teachers to rate their children using the BASC-3 TRS and having their child's data used anonymously for data analysis. Consent was obtained through the district's Category H designation process (i.e., the process that is used to identify students as having a mental health or behavior disorder according to the Ministry of Education), which provided the district with additional funding to support the students' needs. The consent obtained included allowing the student's data, without any personal identifiers, to be used in the current study and anonymously analyzed. The first round of data was collected in 2017. The ESD program was implemented in the treatment classroom for 2 hours per week for 24 weeks from October 2017 to May 2018. Data was collected again from both the control and treatment classrooms in 2018. The data was transferred to a Microsoft Excel spreadsheet by the district behavior specialists. The district staff removed all student identifiers and generated a number to identify the

student in pre/postanalysis to ensure anonymity and that the same student was being compared pre/postintervention.

Once I received approval from the Walden University Institutional Review Board (Approval No. 06-17-20-0027024) on June 17, 2020, I contacted the superintendent of schools on June 18, 2020, and the archival data were released to me on June 22, 2020. The data were reflective of the original participant sample, which included students in 28 classrooms from across the district. The students varied in both their socio-economic status and ethno-diversity.

In this study, I assumed that the staff were willing participants when they completed the BASC-3 TRS and that the district behavior specialists, trained in Level B testing, were diligent in the collection, scoring, and interpretation of the data. Furthermore, I assumed that the district behavior specialists were accurate in transferring the scores from the assessment to a chart which depicts all students' pre/postscores. Another assumption that the students did not know that this data were being collected on them, and therefore, behaved as they normally would within the classroom setting. It was also assumed that parents were informed and supportive of this study, given the fact that they all provided informed consent to participate. Furthermore, I assumed that the methodology I was using to analyze the archival data was appropriate to answer the research questions I had posed. My final assumption was that schools and school districts would not only be interested in my results but would be willing to use these results to inform policy and practice. These assumptions were not contradicted within the course of this study.

This school district enrolled students from three separate municipalities and had a student population of approximately 8,000 students (see Table 1). Of these students, 2,989 were 6 to 11 years of age within the school district. In the 2017–2018 school year, 92 elementary-aged children were coded as Category H (i.e., mental health and behavior disorder) students, although not all of these 92 students had an ESD program within their classroom. A number of these 92 Category H students were not used in the study due to their age, lack of parent consent, or attrition due to leaving the school or school district. Data from 34 of the students that had an ESD program in their schools were collected and used in the current study as well as data from 34 students that did not have access to an ESD program in their classroom.

Table 1

Demographics of Study Sample and School District Population

	N	%
Total district student population	8,000	100
District students between the ages of 6 and 11	2,989	37.4
Category H students between the ages of 6 and 11	92	1.6
Classrooms with students between the ages of 6 to 11	120	n/a
Category H students in control group	34	.04
Category H students in treatment group	34	.04
Participating classrooms in control group	14	11.7

	N	%
Participating classrooms in treatment group	14	11.7

Results

The data in this study were analyzed (see Figure 1) through the use of the Statistical Package for the Social Sciences (SPSS) Version 24 software. I assessed the assumption of normality using a Q-Q scatterplot (see Bates et al., 2014; DeCarlo, 1997; Field, 2013). Shapiro-Wilk's test was applied, which yielded nonsignificant results for all scales (see Figure 2) at the 5% significance level, besides postscore for somatization, which yielded nonsignificant results at the 1% significance level. I also inspected the values of skewness and kurtosis of all variables, following the suggestions of Hair et al. (2014). All values were between the range of -1 to +1, which suggests no substantial deviations from normality (see Hair et al. 2014). Q-Q scatterplots were also used to test the assumption of normality and see if there if there are any underlying relationships between the fitted and residual values. I did not test for sphericity in the data because I had just two levels of repeated measures (i.e., before and after). As such, there is only one set of difference scores and nothing to compare those differences against to indicate violation of sphericity. All plots showed reasonably straight patterns. The results of all of these tests are outlined in the following subsections.

Tests of Assumptions

One of the assumptions that the 2x2 factorial ANOVA method has is that variables' scores follow a normal distribution. It should be noted, however, that ANOVA

has been shown to be quite robust when the assumption of normality is violated (Hair et al., 2014). Nevertheless, significant departing from normality should be taken with care. One of the methods to examine normality is to determine the skewness and kurtosis. Both values should remain between -1 and 1 to indicate normality. As can be seen in the table below, no values surpass this threshold, which indicates no substantial departure from normality.

Table 2

Values of Skewness and Kurtosis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Pre_Anxiety	68	39	108	70.56	11.390	.360	.291	.936	.574
Pre_Depression	68	51	120	75.00	14.138	.608	.291	.387	.574
Pre_Somatization	68	43	106	70.79	13.211	.470	.291	.097	.574
Post_Anxiety	68	35	99	69.29	11.006	.146	.291	.745	.574
Post_Depression	68	50	111	73.84	13.716	.467	.291	-.224	.574
Post_Somatization	68	43	109	69.50	13.917	.628	.291	.265	.574
Valid N (listwise)	68								

Besides looking at skewness and kurtosis, statistical tests can also be used to assess normality. In this study I used the Shapiro-Wilk's tests. A nonsignificance in this test ($p > 0.05$) means that the data is normally distributed. The figure below shows the results of this test. The post-scores for anxiety and depression are not significant on the Shapiro-Wilks ($p > 0.05$). The post-scores of somatization have a p-value just below the 5% significance level ($p = 0.049$). This scenario, together with the values of skewness and kurtosis being within a desired range, indicate that no variables are deviating substantially from a normal distribution, and the analysis proceeded.

Table 3

Assessing Normality using the Shapiro-Wilk's Tests.

Tests of Normality

	Shapiro-Wilk		
Pre_Anxiety	.972	68	.130
Pre_Depression	.973	68	.145
Pre_Somatization	.981	68	.372
Post_Anxiety	.970	68	.094
Post_Depression	.974	68	.172
Post_Somatization	.964	68	.049

In addition to normality, two additional assumptions are present in the 2x2 factorial ANOVA method: homogeneity of intercorrelations and equality of variances. That is, for both levels of the between-subjects factor (in this case, treatment and control groups), variances and intercorrelations of the anxiety, depression and somatization scores must be homogeneous.

Homogeneity of variances was assessed with Levene's test using a p-value of 0.08 (Levene, 1961). The results of Levene's test, $p > .001$, indicated the homogeneity of variances assumption was not violated. See Table 4 for the results.

Table 4

Levene's Test of Equality of Error Variances

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Pre_Anxiety	.116	1	66	.734
Post_Anxiety	.577	1	66	.450
Pre_Depression	.030	1	66	.863
Post_Depression	.896	1	66	.347
Pre_Somatization	3.928	1	66	.052
Post_Somatization	8.198	1	66	.006

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + TreatmentGroup
Within Subjects Design: Time

The results of Levene's test demonstrate that variances are not equal for post-scores of somatization, $p < 0.05$. Pallant (2010) argued that the ANOVA method is robust to violations of this assumption provided that group sizes are similar, which is the case of in this study. Further, Pallant argued that the results can still be interpreted safely.

In this study, I also tested for the presence of multivariant outliers. I assessed for the presence of multivariant outliers using Mahalanobi's distances. Hair et al. (2014) argued that the calculated Mahalanobi's distance divided by the number of variables being tested should not exceed 3 or 4. This was in fact the case for my study as the highest value for this test was 2.52.

Descriptive Statistics

Before testing the hypotheses of the study, I generated descriptive graphs to visually evaluate the differences on the scores of anxiety, depression, and somatization,

before and after treatment, for both the control and treatment group (see Table 2). On the next few pages are the graphs and figures that I generated. In terms of the BASC-3 TRS, a score of 70 or greater indicates that a child has clinically significant concerns within that domain. Scores between 60 and 69 indicate that the student is at risk. Scores below 60 indicate that a student is typically functioning (Reynolds & Kamphaus, 2015).

Correlation analysis

To give an initial overview of how the variables of this study are related, a correlation analysis was performed. Correlation coefficients are indicators of associations between variables (Pallant, 2010). There are a number of different statistics available to measure association, depending on the level of measurement and the nature of the data. Pearson' coefficient '*r*' is designed for interval level (continuous) variables, whereas Spearman's '*rho*' is designed for use with ordinal level or ranked data and is particularly useful when the data does not meet the criteria for Pearson correlation (Pallant, 2010). As the variables under study are metric, Pearson's coefficients were calculated. Values between 0.10 and 0.29 indicate a small degree of association, while values between 0.30 and 0.49 are considered medium and values higher than 0.50 represent a high degree of association (Cohen, 1988). Table 5 shows the calculated coefficients for pre/post scores of anxiety, depression, and somatization.

Table 5

Correlation Table

Correlations

		Pre_Anxiety	Pre_Depression	Pre_Somatization	Post_Anxiety	Post_Depression	Post_Somatization
Pre_Anxiety	Pearson Correlation	1	0,564**	0,665**	0,928**	0,502**	0,574**
Pre_Depression	Pearson Correlation	0,564**	1	0,599**	0,531**	0,968**	0,560**
Pre_Somatization	Pearson Correlation	0,665**	0,599**	1	0,724**	0,611**	0,963**
Post_Anxiety	Pearson Correlation	0,928**	0,531**	0,724**	1	0,529**	0,687**
Post_Depression	Pearson Correlation	0,502**	0,968**	0,611**	0,529**	1	0,609**
Post_Somatization	Pearson Correlation	0,574**	0,560**	0,963**	0,687**	0,609**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The coefficients show that all correlations are large ($r > 0.500$). That is, pre and post scores of anxiety, depression and somatization have a strong linear relationship.

Hypothesis Testing

The next step was to measure if there is a statistically significant interaction between Time (pre and post treatment) and Treatment Group (being treated by ESD program). If this is significant, it means that the variations in anxiety, depression or somatization between time 1 (pretreatment) and time 2 (posttreatment) are significantly different for both groups. That is, the effect of time was different for the treatment group, when compared to the comparison group. This was examined with the Tests of Within-Subjects Effects table in SPSS (Table X), by looking at the product term Time*Treatment Group. If the corresponding effect is significant ($p < 0.05$) using Greenhouse-Geisser correction (which is used when examining 2x2 factorial ANOVAs), the pre/post variation in the psychological scale is significantly different for both groups (Hair et al., 2014). The comparison of the psychological scores between groups (without considering time)

and between time 1 and time 2 (without considering groups), also called main effects, are examined further.

Results for Anxiety

I have listed the original research question followed by the results of the statistical analysis I conducted for anxiety. I have supplied the statistical data which addresses the research question for anxiety.

RQ1: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' anxiety scores as measured by the BASC-3 TRS?

H_a1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1b: The time lapse between the pre- and posttreatment measures have a significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$1b: The time lapse between the pre- and posttreatment measures have no significant effect on the anxiety scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a1c: The interaction between pre- and posttreatment anxiety scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$1c: The interaction between pre- and posttreatment anxiety scores is not significantly different between the group that was exposed to an ESD and the group that was not.

Figure 1 shows the difference in anxiety levels. The average score for the treatment group decreased from 72.94 to 68.79 after the ESD program. For the control group, however, the average scores increased slightly. Therefore, according to the BASC -3 TRS, students in the treatment group moved from being in the clinically significant category to being in the at-risk, post treatment. The control group stayed within the at-risk category, however as a group, they moved closer towards being classified in the clinically significant range.

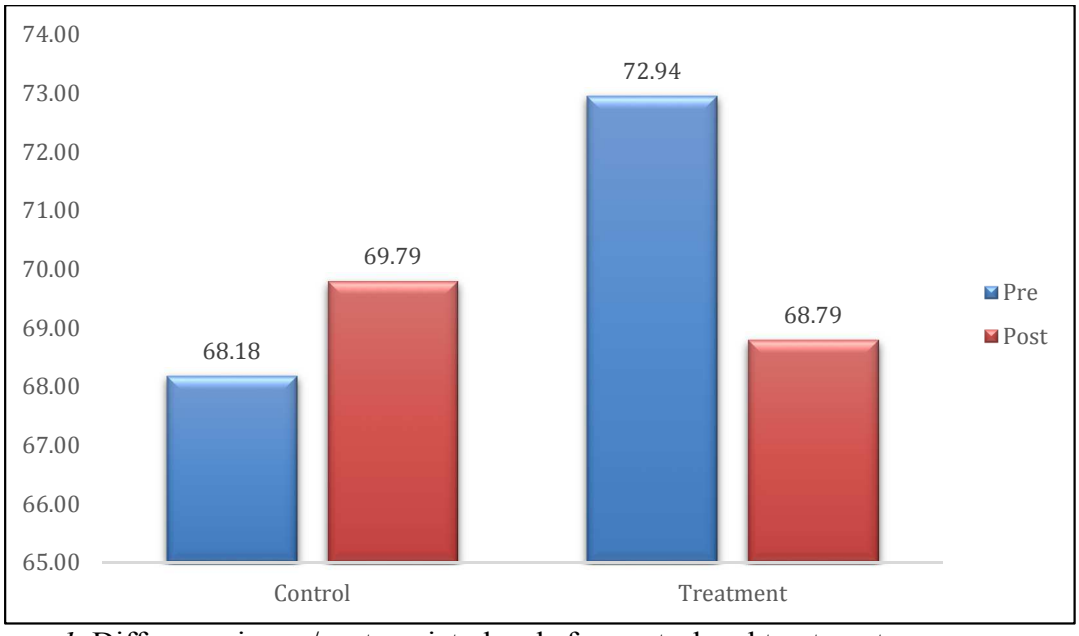

Figure 1. Difference in pre/post anxiety levels for control and treatment groups.

Figure 2 shows pre/post anxiety for anxiety using a plot line graph. This is another graphic which demonstrates that anxiety scores for the comparison group increased, while they decreased for the treatment group.

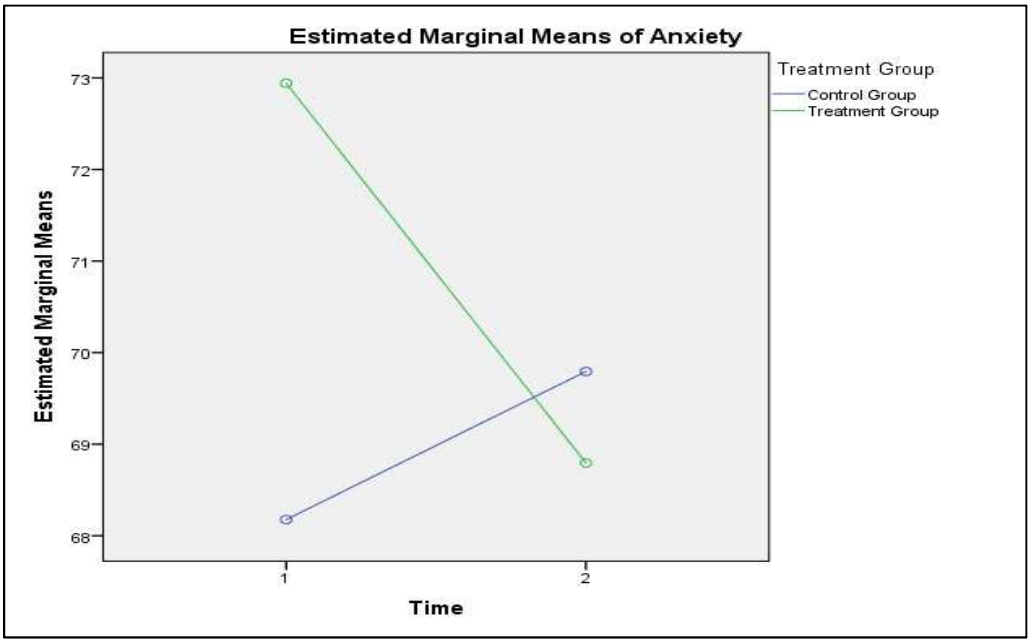

Figure 2. Pre/post anxiety scores for control and treatment on plot line graph.

Table 6

Descriptive Statistics

Descriptive Statistics

	Treatment Group	Mean	Std. Deviation	N
Pre_Anxiety	Comparison Group	68,18	10,513	34
	Treatment Group	72,94	11,883	34
	Total	70,56	11,390	68
Post_Anxiety	Comparison Group	69,79	11,012	34
	Treatment Group	68,79	11,143	34
	Total	69,29	11,006	68

Table 7

Main Effect of Time

Tests of Within-Subjects Effects

Measure: Anxiety

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	54,382	1	54,382	10,839	0,002	0,141
	Greenhouse-Geisser	54,382	1,000	54,382	10,839	0,002	0,141
	Huynh-Feldt	54,382	1,000	54,382	10,839	0,002	0,141
	Lower-bound	54,382	1,000	54,382	10,839	0,002	0,141
Error(Time)	Sphericity Assumed	331,147	66	5,017			
	Greenhouse-Geisser	331,147	66,000	5,017			
	Huynh-Feldt	331,147	66,000	5,017			
	Lower-bound	331,147	66,000	5,017			

Table 8

Main Effect of Treatment Group

Tests of Between-Subjects Effects

Measure: Anxiety
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	665000,735	1	665000,735	2730,365	0,000	0,976
TreatmentGroup	120,471	1	120,471	0,495	0,484	0,007
Error	16074,794	66	243,557			

Table 9

Interaction Effect

Tests of Within-Subjects Contrasts

Measure: Anxiety

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time * TreatmentGroup	Linear	282,471	1	282,471	56,298	0,000	0,460
Error(Time)	Linear	331,147	66	5,017			

Table 6 shows descriptive statistics for pre and post anxiety scores. The main effect of Time was significant, F (1,66) = 10.839, p = .002; η_p^2 = .460 (Table 3). The main effect of TreatmentGroup was not significant, F (1,66) = 0.495, p = .484; η_p^2 = .007 (Table 8). The interaction effect was significant, F (1,66) = 56.298, p < .001 or 2,0504E-10; η_p^2 = .460 (Table 9).

Results for Depression

I have listed the original research question followed by the results of the statistical analysis I conducted for depression. I have supplied the statistical data which addresses the research question for depression.

RQ2: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' depression scores as measured by the BASC-3 TRS?

H_a2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2b: The time lapse between the pre- and posttreatment measures has a significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$2b: The time lapse between the pre- and posttreatment measures has no significant effect on the depression scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a2c: The interaction between pre- and posttreatment depression scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$2c: The interaction between pre- and posttreatment depression scores is not significantly different between the group that was exposed to an ESD and the group that was not.

In terms of depression scores, the same scenario is demonstrated as was shown in the test for the difference in anxiety levels. While the average scores for depression decreased in the treatment group, the average scores increased in the control group (Figure 3). Therefore, according to the BASC -3 TRS, students in the treatment group moved from being in the clinically significant category to being in the at-risk, post treatment. The control group stayed within the at-risk category, however they, as a group, moved closer towards being classified in the clinically significant range.

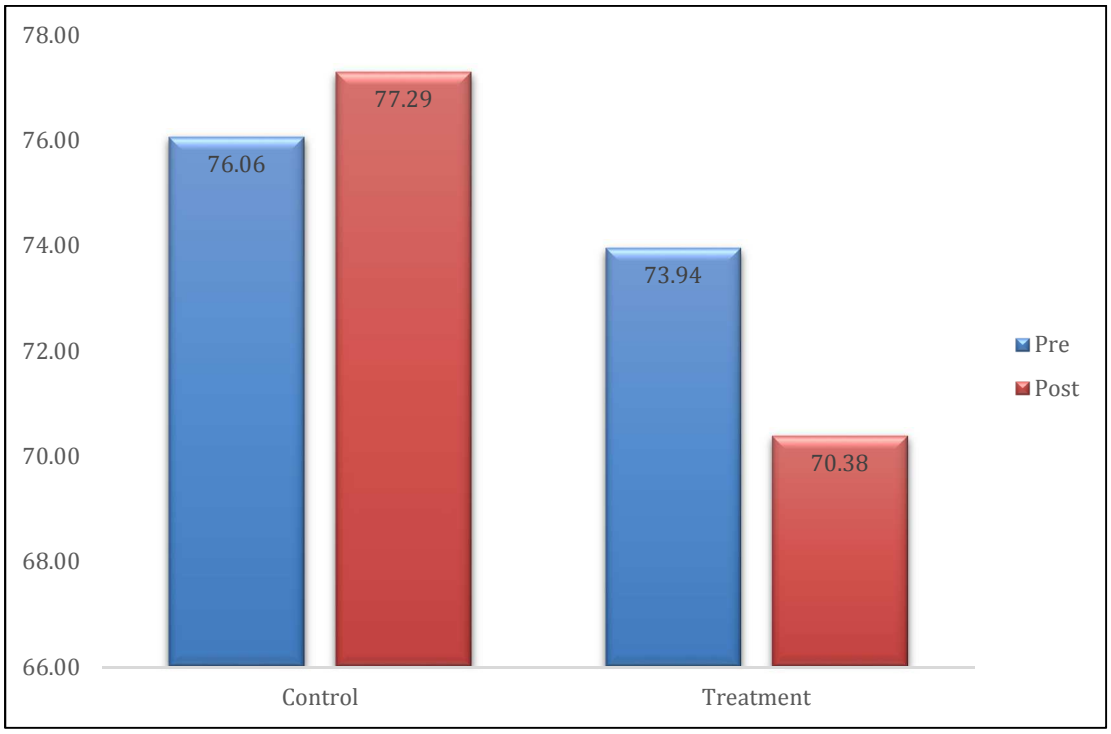

Figure 3. Difference in pre/ post-depression levels for control and treatment groups.

Figure 4 shows pre/post differences for depression using a plot line graph. This is another graphic which demonstrates that depression scores for the comparison group increased, while they decreased for the treatment group.

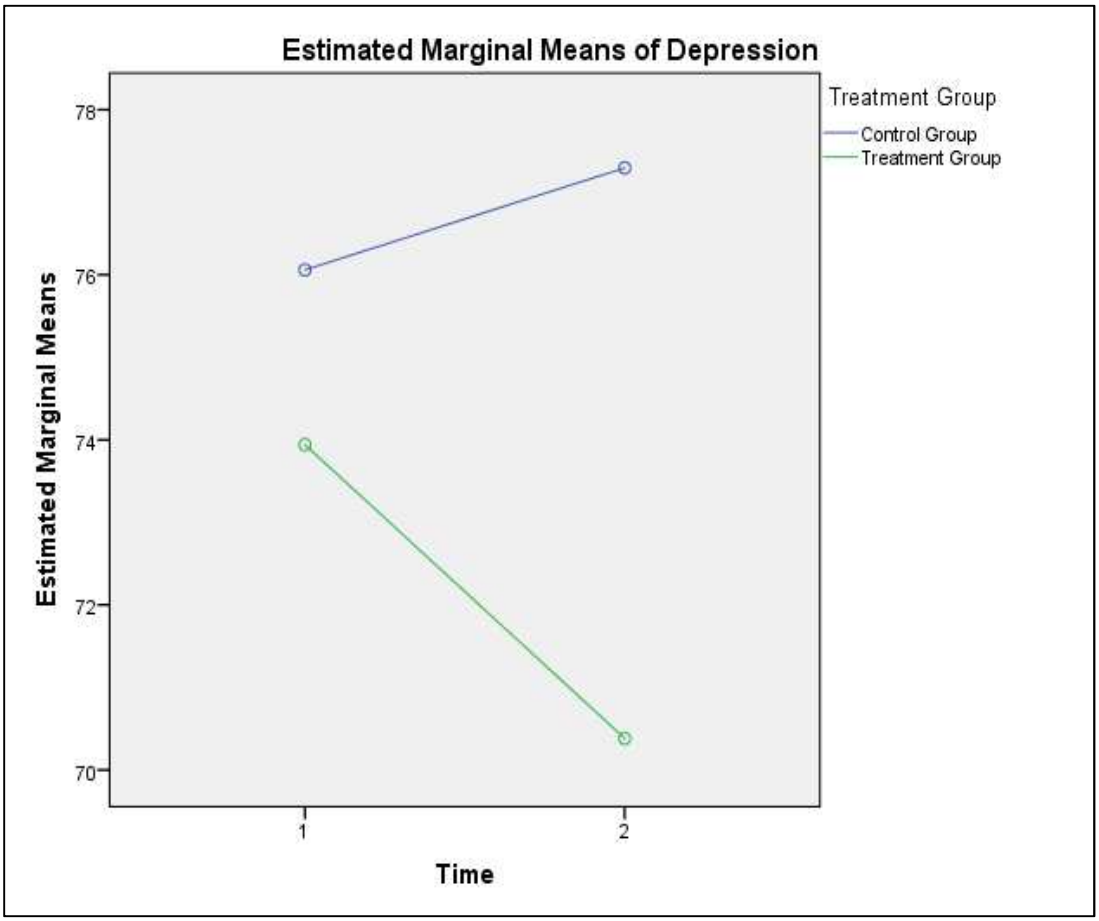

Figure 4. Pre/post depression scores for control and treatment on plot line graph.

Table 10

Descriptive Statistics

Descriptive Statistics

	Treatment Group	Mean	Std. Deviation	N
Pre_Depression	Comparison Group	76,06	14,234	34
	Treatment Group	73,94	14,174	34
	Total	75,00	14,138	68
Post_Depression	Comparison Group	77,29	14,145	34
	Treatment Group	70,38	12,541	34
	Total	73,84	13,716	68

Table 11

Main Effect of Time

Tests of Within-Subjects Effects

Measure: Depression

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	45,890	1	45,890	13,446	0,000	0,169
	Greenhouse-Geisser	45,890	1,000	45,890	13,446	0,000	0,169
	Huynh-Feldt	45,890	1,000	45,890	13,446	0,000	0,169
	Lower-bound	45,890	1,000	45,890	13,446	0,000	0,169
Error(Time)	Sphericity Assumed	225,250	66	3,413			
	Greenhouse-Geisser	225,250	66,000	3,413			
	Huynh-Feldt	225,250	66,000	3,413			
	Lower-bound	225,250	66,000	3,413			

Table 12

Main Effect of Treatment Group

Tests of Between-Subjects Effects

Measure: Depression
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	753195,890	1	753195,890	1997,738	0,000	0,968
TreatmentGroup	693,007	1	693,007	1,838	0,180	0,027
Error	24883,603	66	377,024			

Table 13

Interaction Effect

Tests of Within-Subjects Contrasts

Measure: Depression

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time * TreatmentGroup	Linear	195,360	1	195,360	57,242	0,000	0,464

Table 10 shows descriptive statistics for pre/postdepression scores. The main effect of Time was significant, F (1,66) = 13.446, p < .001 or 0,000492; η_p^2 = .169 (Table 11). The main effect of TreatmentGroup was not significant, F (1,66) = 1.838, p = .180; η_p^2 = .027 (Table 12). The interaction effect was significant, F (1,66) = 57.242, p < .001 or 1,5844E-10; η_p^2 = .464 (table 13).

Results for Somatization

I have listed the original research question followed by the results of the statistical analysis I conducted for somatization. I have supplied the statistical data which addresses the research question for somatization.

RQ3: Does exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom have an effect on 6- to 11-year-old students' somatization scores as measured by the BASC-3 TRS?

H_a3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3a: Exposure to an ESD for 2 hours per week for 24 weeks in an elementary school classroom has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

H_a3b: The time lapse between the pre- and posttreatment measures has a significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

$H_0$3b: The time lapse between the pre- and posttreatment measures has no significant effect on the somatization scores of 6- to 11-year-olds as measured by the BASC-3 TRS.

*H*a3c: The interaction between pre- and posttreatment somatization scores is significantly different between the group that was exposed to an ESD and the group that was not.

$H_0$3c: The interaction between pre- and posttreatment somatization scores is not significantly different between the group that was exposed to an ESD and the group that was not.

Finally, for somatization, there was also a decrease in scores of the treatment group, from 69.38 to 65.68 and there was an increase in mean scores of the control group from 72.21 to 73.32 (Figure 5). Therefore, according to the BASC -3 TRS, although the treatment group scores for somatization decreased, as a group, they remained in the at-risk category, posttreatment. The scores for the control group increased and they remained in the clinically significant range.

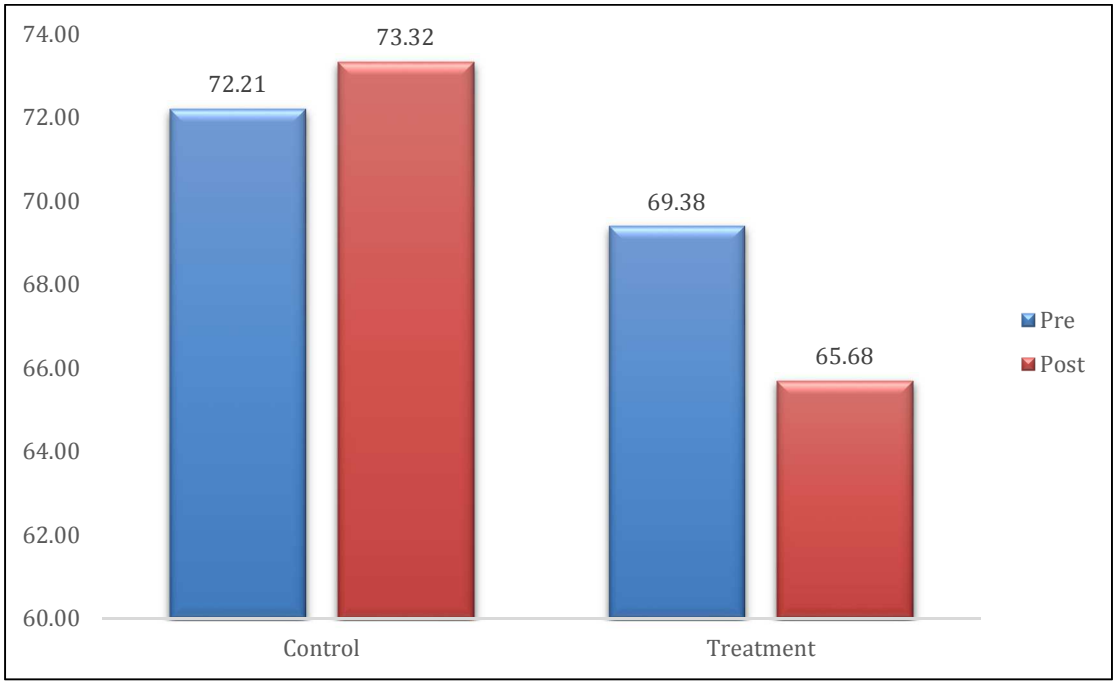

Figure 5. Difference in pre/post somatization levels for control and treatment groups.

All the changes in scores outlined in the graphs above serve as initial evidence about the efficacy of the treatment. However, a more robust conclusion is dependent on the results of the 2x2 factorial ANOVA method analysis.

Figure 6 shows the plot line graph of somatization. The scenario is maintained: the decrease in mean scores in the treatment group was not seen in the control group.

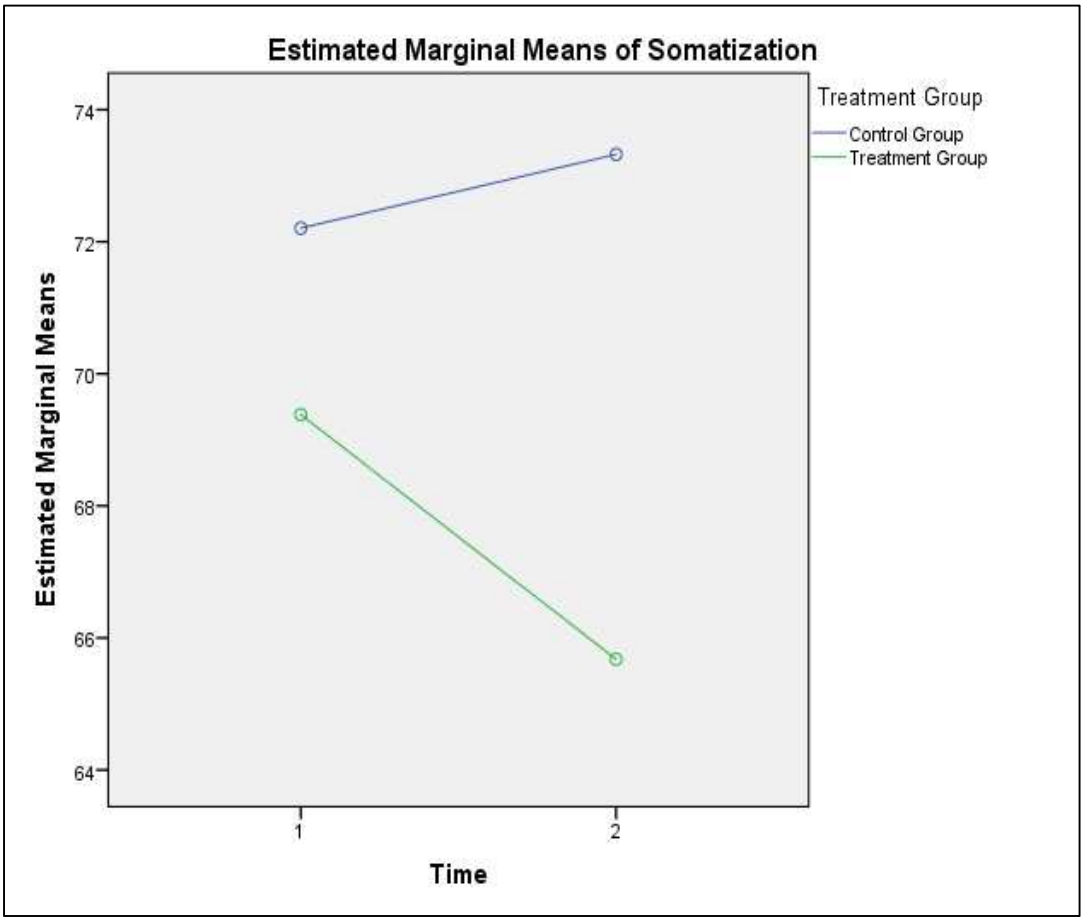

Figure 6. Pre/post somatization scores for control and treatment on plot line graph

Table 14

Descriptive Statistics

Descriptive Statistics

	Treatment Group	Mean	Std. Deviation	N
Pre_Somatization	Comparison Group	72,21	14,624	34
	Treatment Group	69,38	11,678	34
	Total	70,79	13,211	68
Post_Somatization	Comparison Group	73,32	15,799	34
	Treatment Group	65,68	10,654	34
	Total	69,50	13,917	68

Table 15

Main Effect of Time

Tests of Within-Subjects Effects

Measure: Somatization

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	56,941	1	56,941	13,602	0,000	0,171
	Greenhouse-Geisser	56,941	1,000	56,941	13,602	0,000	0,171
	Huynh-Feldt	56,941	1,000	56,941	13,602	0,000	0,171
	Lower-bound	56,941	1,000	56,941	13,602	0,000	0,171
Error(Time)	Sphericity Assumed	276,294	66	4,186			
	Greenhouse-Geisser	276,294	66,000	4,186			
	Huynh-Feldt	276,294	66,000	4,186			
	Lower-bound	276,294	66,000	4,186			

Table 16

Main Effect of Treatment Group

Tests of Between-Subjects Effects

Measure: Somatization
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	669202,941	1	669202,941	1898,515	0,000	0,966
TreatmentGroup	931,882	1	931,882	2,644	0,109	0,039
Error	23264,176	66	352,488			

Table 17

Interaction Effect

Tests of Within-Subjects Contrasts

Measure: Somatization

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time * TreatmentGroup	Linear	197,765	1	197,765	47,241	0,000	0,417
Error(Time)	Linear	276,294	66	4,186			

Table 14 shows descriptive statistics for pre/post somatization scores. The main effect of Time was significant, F (1,66) = 13.602, p < .001 or 0,000459; η_p^2 = .171 (Table

15). The main effect of TreatmentGroup was not significant, F (1,66) = 2.644, p = .109; η_p^2 = .039 (Table 16). The interaction effect was significant, F (1,66) = 47.241, p < .001or 2, 7205E-9; η_p^2 = .417 (Table 17).

Result of Hypothesis Testing

My results indicated significant differences on the pre/post score variations of anxiety, depression, and somatization between the treatment and control group. Specifically, there was a significant interaction effect for anxiety, F (1, 68) = 56.298, p = 2.05E-10. The partial eta squared (effect size) of 0.460 indicates a very strong effect according to Cohen (1988). A slightly stronger interaction effect was observed for depression, F (1, 68) = 57.242, p = 1.5844E-10, with a partial eta squared of 0.464. A smaller effect size (but also significant) was demonstrated for somatization, F (1, 68) = 47.241, p = 2.7205E-9, partial eta squared of 0.417. This means that the effects of the intervention were significantly different between treatment and control groups and quite similar in all three categories of internalizing scores (anxiety, depression, and somatization). The corresponding effect sizes were all strong according to thresholds established by Cohen (1988).

Although the interpretation of main effects is questionable due to the presence of interaction effects (Pallant, 2010), the figure above shows that the main effect of being exposed to the treatment or not (TreatmentGroup) is not significant neither for anxiety (F = 0.495, p = 0.484_, nor for depression (F = 1.838, p = 0.180) or somatization (F = 2.644, p = 0.109).

The following table contains the summary of the hypothesis testing. All the hypotheses outlined in this study were confirmed. That is, treatment with an ESD significantly decreases the scores for anxiety, depression and somatization in 6 to11 year old children. The decrease on the scores for the three dependent variables were significantly higher for the treatment group, when compared to a control group who has not received any intervention.

Table 18

Results of Hypothesis Testing

Hypothesis	Result
H_{1c}: The interaction between pre and post treatment anxiety scores is significantly different between the group that was exposed to an emotional support dog and the group that was not.	Confirmed
H_{2c}: The interaction between pre and post treatment depression scores is significantly different between the group that was exposed to an emotional support dog and the group that was not.	Confirmed
H_{3c}: The interaction between pre and post treatment somatization scores is significantly different between the group that was exposed to an emotional support dog and the group that was not.	Confirmed

Summary

In this chapter, I reviewed the processes involved with the collection of the archival data and how that data was subsequently released to me for analysis. I have also detailed the demographic nature of this data and its relationship to the rest of the school district students. There was a bit of a deviation in the actual statistical analysis when compared to the plan I had previously outlined in Chapter 3. As I mentioned earlier in Chapter 4, I decided to use the Shapiro Wilk's test positing it was more robust than the Q-Q scatterplot I had originally planned to use. Also, upon reflection I did not test for

Sphericity because I have just two levels of repeated measures (before and after) and there is only one set of difference scores and nothing to compare those differences against to indicate a violation of sphericity. The rest of the statistical analysis remained as I had previously planned and outlined in Chapter 3.

I completed my data analysis using SPSS Version 24 software. The results of the data analysis indicated that in all three instances the null hypothesis was rejected, that is, the contrast between the treatment and the control groups within the scores for anxiety, depression, and somatization on the BASC-3 TRS were significantly different between the group that was exposed to an emotional support dog and the group that was not. These findings support the idea that ESD programs could have some potentiality in the current scope of practice within schools and their districts. Further, these results provide quantitative data to support the current use of ESD programs in schools.

In looking at the research questions regarding time lapse, I determined that the effect of time was dependent on whether or not the student belonged to the treatment or control group (presence of interaction effects for the three psychological aspects). As such, it is not appropriate to interpret the effects of the variable of Time on its own. According to Pallant (2010), the effects should only be interpreted when there is no interaction effect.

In Chapter 5, I will discuss the ramifications of my findings in relation to the peer-reviewed literature I presented in Chapter 2. I will also discuss the scope and limitations of this study and how this might affect the extrapolation of my findings to support other research in the field. Finally, I will give recommendations and the potential

impact for positive social change, however, I will ensure I do not exceed the boundaries of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to conduct an archival data analysis to determine if the presence of an ESD in the classroom was associated with changes in teachers' ratings of students' scores for anxiety, depression, and somatization behaviors as assessed by teachers' ratings on the BASC-3 TRS. Furthermore, the current research in the field was predominately qualitative in nature, and although there was qualitative support for the use of ESDs in schools, there was a paucity of quantitative research in the field to support the current practice. Through this study, I attempted to address this gap in the literature.

The findings of this quantitative study are limited to 34 students across 14 classrooms who received the dog therapy intervention (i.e., the treatment group) for two 2-hour sessions per week for 24 weeks and 34 students across 14 classrooms who did not receive the dog therapy intervention (i.e., the control group). All of the 6 to 11-year-old elementary students in the treatment and control group were designated by the school district as having a Category H designation, which indicates the presence of an emotional or behavioral disorder. These 28 classrooms were in 14 elementary schools located in the southern interior of British Columbia, Canada. The archival data were collected by district behavior specialists over a 6-month period between 2017 and 2018 after teachers filled out the BASC-3 TRS rating scale for students in their classrooms. The data that were collected and analyzed for this study included anxiety, depression, and somatization subscales from the BASC-3 TRS. I chose to use the BASC-3 TRS assessment because of

the consistency of research supporting its reliability and validity (see Reynolds & Kamphaus, 2015). After analyzing the data in this study, I rejected the null hypothesis for all three research questions and confirmed that the pre- and posttreatment scores for anxiety, depression, and somatization were significantly different between the treatment group and the control group. For all three measures (i.e., anxiety, depression, and somatization), the scores for the treatment group went down posttreatment, while the scores for the control group went up posttreatment.

This chapter is divided into five sections. In the first section, I address my interpretation of the findings as they relate to the research discussed in Chapter 2 and the emerging themes that are growing in this field. In this section, I also look at the association the research has had with Russo's (1999) HAB theory. In the following section, I discuss the theoretical framework and how it relates to my research findings. In the third section, I discuss the strengths and limitations of the study as well as my recommendations for further research. Included in my discussion on future research is the application of school district wide ESD programs, the potential positive impact on the mental health of elementary students using ESD, and the difficulties in getting consistent results amongst ESD programs even when they are established in schools and districts. The impact on positive social change and my recommendations in the light of the findings are presented next. In the final section, I summarize and highlight the key findings of this study.

Interpretation of the Findings

Due to the lack of quantitative studies examining the short-term direct effects of the regular presence of ESDs in schools (Grajfoner et al., 2017), my findings are important in that they add new research in this field and suggest that the presence of an ESD can promote a positive change in elementary student scores for anxiety, depression, and somatization. I rejected the null hypotheses of all three research questions, which supports the alternative hypotheses that the presence of an ESD program in an elementary school setting can favorably impact the internalizing scores on a standardized instrument.

Anxiety

In RQ1, I examined whether the pre- and postanxiety scores were significantly different between the treatment and the control group. The findings were that the students scored significantly different in regards to anxiety, when comparing the treatment and control group postintervention. Specifically, the scores for anxiety in the treatment group decreased over the course of treatment, while the scores for anxiety in the control group increased over the course of treatment. The interaction effect for anxiety F (1,68) =56.298, $p < 0.001$ and the partial eta squared (effect size) of 0.460 indicated a very strong effect, according to Cohen (1988).

These findings are supported in a recent article by Crossman et al. (2020) who examined 78 elementary students in three different conditions: interaction with a dog, a tactile-stimulation control condition, and a waiting control condition. The study conclusions were that brief, unstructured encounters with an ESD elevated the student's mood and created a reduction in anxiety.

Much of the research on anxiety and dog programs has been done in the postsecondary university settings (Grajfoner et al., 2017). Anderson (2017) found similar results with a research team using 168 university students. They examined whether the interaction or proximity of a dog could reduce stress and anxiety during exam times. The results of the current study research extend Anderson's findings and suggest that ESD interventions are associated with reduced anxiety levels in elementary-aged children.

The results from the current study also support those of Sloan-Oberdier (2018) who used ESD in conjunction with elementary school counselors. Sloan-Oberdier found that the presence of the dogs helped with emotional regulation, which included managing anxiety, and suggested that the introduction of this ESD/counselor program positively changed the student's ability to regulate their emotional behavior.

The importance of being able to regulate anxiety has been highlighted by many researchers (Ameringen et al., 2003; Hashempour & Mehran, 2014; Killu & Crundwell, 2014). The BASC -3 TRS places students' scores in domains of functioning. Students who score below 60 (on the 100-point scale) are said to be typically functioning. Students who score 60–69 are deemed to be at risk for anxiety, and those that score 70 and above are in the clinically significant range for anxiety (Reynolds & Kamphaus, 2015). In the current study, students had a preintervention anxiety score of 72.94, putting them in the clinically significant range for anxiety. After 6 months with access the ESD program, these scores decreased to 68.79, dropping from the clinically significant range to being at risk. When comparing to the control group who did not have access to the ESD program,

those students initially scores 68.18 and 6 months later, there scores increased to 69.79 moving them closer to the clinically significant range.

The results of this study are important because untreated anxiety has long-term effects, such as poor working memory, difficulty with long-term relationships, dropping out of school, drug addiction, and possible criminal activity (Sparker, Schubert, Green, & Ameriger, 2015). To further the potency of these findings, Merikanagas et al. (2011) suggested that the development of severe anxiety has its roots in early childhood. The study findings on anxiety scores and ESD exposure that the ESD program is in line with current research in this field and add quantitative support to the idea that the use of ESD programs could mitigate anxiety in elementary school students. Although the current study findings are supported in the literature, Crossman (2016, 2020) contended that more research is needed to determine the limitations and extent of the use of ESD programs to support students with anxiety.

Depression

In RQ2, I examined whether the pre- and postdepression scores were significantly different between the treatment and the control groups after the intervention. The findings were that the students in the treatment group scored significantly different in regards to depression postintervention. The student scores preintervention were 73.94, placing these students in the clinically significant range for depression. Posttreatment their score dropped to 70.38. In comparison, the control group started at 76.06, placing them in the clinically significant range for depression, and after 6 months without intervention, their scores had increased to 77.29. The decrease in depression scores was slightly stronger

than the decrease in anxiety scores, with anxiety at F (1,68) =56.292, $p < 0.001$, and the partial eta squared (effect size) of 0.464.

The current study findings support the current findings in the field. Both Dietz et al. (2011) and Silva and Osorio (2018) concurred that the use of ESD can positively impact a child exhibiting depressive symptomology. Furthermore, whether or not the child has had a formal diagnosis of depression, it appears that a dog's presence in these situations could be beneficial (Silva & Osorio, 2018). Karlene et al. (2018) conducted a meta-analysis examining articles that studied the pre- and posteffects of ESD on students ranging in age from 6 to 12 years old. After a thorough review, the authors were able to use eight qualitative studies and found that there was a small to moderate effect size, which indicated that the use of dog therapy for children suffering from trauma symptoms, including depression, was an effective form of treatment (Karlene et al., 2018). Furthermore, Mullen (2018) suggested that children as young as 3 years old have been examined and diagnosed with a form of depression and stated that children 3 to 8 years of age do not have the emotional language to articulate their situation and, therefore, meeting the criterion for depression in the *DSM-5* is not a possibility. However, teachers can use the BASC-3 TRS to discern the mental health and behavior difficulties that are endemic to a particular student and program accordingly.

The findings from the studies I have highlighted seem promising; however, further research is still needed. Karlene et al. (2018) suggested that there are not enough well-executed studies to make any conclusions as to whether the use of dogs helps to reduce depression in youth and is an effective long-term practice. However, making long-

term predictions about the effectiveness of therapies to reduce depression is important given the magnitude of the problem. According to the Center for Disease Control and Prevention (2018), the frequency of depression is 0.5% for children between the ages of 3 to 5 years old, 2% for those between 6 to 11 years old, and for those in the adolescent years between 12 and 17 years old is 12%. Therefore, finding an effective long-term intervention that has been statistically proven is important. The results of the current research could be extended to see if the reduction in internalizing symptoms for children was more significant after 12 months with access to the ESD program because my assessment in this study stopped after 6 months.

Somatization

In RQ3, I examined the links between the ESD intervention and changes in the internalizing behavior of somatization. Those with somatization are physically sensitive individuals who have persistent concerns about their physical symptoms, health, and well-being (Reynolds and Kamphaus, 2015). Somatization has been thought to be affiliated with anxiety (Reynolds & Kamphaus). The data analysis in the current study resulted in the null hypothesis being rejected such that postintervention scores for the treatment group were significantly different than the preintervention scores for somatization. Specifically, the postintervention scores for the treatment group were 65.68 as compared to their preintervention scores of 69.38. Therefore, pre-intervention, this group was on the cusp of a clinically significant score for somatization; however, after the intervention they are within the at-risk range. The control group had a preintervention score in the clinically significant range of 72.21 and their postintervention score

increased to 73.32. Even though somatization had a smaller effect size than the results I found for anxiety and depression, it was also strong at F (1,68) = 47.241, $p < 0.001$ with a partial eta squared of 0.417.

An exhaustive review of the literature regarding children, somatization, and therapy dogs has not brought forward any specific research, although Neil and Smith (2017) presented a possible explanation. They examined whether teachers could distinguish between students who had anxious or somatic symptomology, investigating 1,346 students who were in the age range of 7 to 11 years old, 51 teachers, and 144 parents. Their findings suggested that teachers were not overly sensitive in identifying the levels of their student's anxiety or somatic symptomology; therefore, teachers may have a difficult time identifying students who would benefit from additional support or intervention in these areas. To compound this, Reynolds and Kamphaus (2015) and Mullen (2018) pointed out that most young students cannot articulate their feelings and end up presenting with somatic difficulties. The use of the BASC-3 TRS could help to alleviate this concern by helping teachers to correctly identify students with somatization concerns.

The use of an ESD program in the classroom may have a positive impact on the student with somatic concerns by addressing their emotional needs that perpetuates emotional regulation and personal growth. An ESD program that has consistency as well as defined terms, goals, and objectives is integral to student support and academic success (Friesen, 2010).

Theoretical Framework

The findings in this study focus on whether the presence of an emotional support dog in the classroom was associated with changes in teachers' ratings of students' scores for anxiety, depression, and somatization behaviors as assessed by the BASC -3 TRS. The theoretical framework that was used was Russo's HAB Theory. Russo suggests that there are three aspects that define HAB; these include the recognition that there is a distinct and unique relationship between a human and an animal, that this relationship can only exist if it is reciprocal, and the relationship can be established within a single mutually fulfilling contact (Russo, 1999). The results from my study indicated a statistically significant difference in anxiety, depression, and somatization scores of the treatment group, posttreatment. The scores for the control group also changed over the course of the six months, however unlike the treatment group whose scores all decreased, the control groups scores all increased over the same period of time. Based on Russo's framework, I assume that these three components were established between the students and the emotional support dog and were a significant factor in achieving the outcome. This is consistent with the findings of Payne, Bennet, & McGreevy (2015) who suggested that the HAB relationship not only promotes positive changes in attitude but also the wellbeing of both species. Other researcher, including Bassette (2013) and Friedman et al. (1983), also found support through their findings that HAB has the potential to assist in mental health concerns and to decrease extreme behavior in students.

In examination of the literature in this field, the findings suggest that the connection between humans and animals can play an influential part in contributing to

emotional support in the lives of children and adolescents (Ascione, 1992; Daly & Morton, 2006; Davis & Juhasz, 1995; Kens, Stuart-Parrigon, and Coifman, 2018; McNicholas & Collins, 2001) as well as enhancing attachment and social support (Meehan, Massavelli and Pachana, 2017). Finally, a consistent finding within the literature suggest that regular exposure to a dog can contribute to a student's reduction in aggressive behavior as well as contribute to their social and cognitive development (Vidovic,1999, Anderson & Olson; 2006; Beetz, Turner and Kotrschal, 2012; Hergovich, Monshi, Semmler, and Zieglmayer, 2002; Kortschal & Ortbauer, 2003; Rud & Beck, 2002; Younggren, Boisvert, and Boness, 2016). My findings were consistent with the current literature in the field and support the idea that emotional support dogs have an influence on social and emotional functioning of children ages 6 to 11. My study adds to the current body of research by providing quantitative support for the introduction of the ESD program in schools to help students with internalizing difficulties of anxiety, depression, and somatization. The presence of a dog in the student's classroom for 2 hour per week for 24 weeks had a statistically significant impact on student's scores in the three domains. This low-cost intervention can be made available to all students and removes stigma associated with leaving the classroom to obtain extra help or resources to assist with anxiety, depression, or somatization. Although my study is supported by the current literature in the field, it is also important to examine the limitations of my study.

Limitations of the Study

A significant limitation in the field regarding emotional support dogs in schools is the inconsistency of operational terms and definitions. This lack of consensus with

operational terms and definitions, makes comparing my results to current research in the field somewhat difficult as I can't be clear that we are always measuring the same things. Crossman (2016) suggested that the definitions of dogs used in student and public accompaniment are not clear or consistent among researchers in this field. I did attempt to circumvent this issue by using definitions in my study from Schoenfeld -Tacher (2017). These definitions have been more widely adopted in more current research to define four main types of support dogs that are used in our North American communities; these include service dogs, therapy dogs, emotional support dogs and facility dogs. I also used definitions for anxiety, depression, and somatization that were created by Reynolds and Kamphaus (2015); these definitions were an integral part of their development of the BASC-3 assessment tool which has consistent reliability and validity. Further, using clinical definitions for internalizing behavior for this study from the BASC-3 with its proven reliability and validity has allowed my findings to be consistent in interpretation for other future research. However, my sample size could limit the generalizability of my findings, and to do so would pose a threat to the external validity of my study.

My study unfortunately followed another criticism of research in the field which is created by small sample sizes. According to Crossman (2016), small sample sizes in research in this field have made it difficult to extrapolate the results. In my study, I also had a smaller sample size to content with (n =68). This was due to the number of emotional support dogs available in the school district as well as the number of students designated for the British Columbia Ministry of Education H category of mental health

and behavioral difficulties. My sample size and regionality makes it difficult to generalize beyond the identified population.

A third limitation I need to address is the data collection process. The data collection process all occurred within the school district. This was a school district initiative and the BASC-3 TRS was filled out by the classroom teacher, and scored and compiled by the district behavior specialist. I was not involved in this process and am not able to speak to whether or not the procedures and protocols were consistent. As such, this could represent a threat to the internal validity in my study. As well as district processes in place, size and regionality of my sample are another limitation. The size and regionality of my sample may also make generalizability difficult beyond my identified population. The study took place in a southern interior school district in British Columbia, Canada. The district is considered small and the population may not be as diverse as would be ideal, or would be found in larger metropolitan areas. Again, this impacts generalizability of my results beyond the population in which my study took place. As well as the size of the district, other factors that haven't been examined but could impact the outcome of the study could include the breed of the dogs, their ages, and the level of training the dog has received as well as ongoing training the dog receives (Beetz & Marhofer, 2012). Further, if students have dogs of their own at home, they may respond differently than students who have not been exposed to dogs on a regular basis.

Finally, classroom composition is another factor that should be considered in looking at the possible limitations of the study. The classrooms in the study may have different make-ups, including the number of coded children, the gender of the children,

and the number of students with internalizing or externalizing difficulties. Further, the teacher's relationship with the dog could also be a factor. The teacher's relationship with the dog and teaching style could play a part in influencing the findings (Beetz, 2013). An ESD program that has consistency as well as defined terms, goals, and objectives is integral to student support and academic success (Friesen, 2010). Unfortunately, I am not able to speak to the consistency, and how the goals and objectives of the program were carried forward in the individual classrooms.

In spite of these limitations, I was able to determine that the use of an emotional support dog in classrooms significantly impacted students' scores for anxiety, depression, and somatization. This is supported by the current literature I examined in Chapter 2 and adds to the body of research, while using operationally defined terms and providing quantitative support to the current body of literature.

Recommendations

In looking at the recommendations for future research it is important to address some of the limitations that I have identified. Specifically, sample size, size and regionality, the data collection process, and the consistent use of operational definitions. As well as recommendations that I have identified through the limitations section, other problematic areas that need to be addressed in future research include: the impact that therapy dogs have on externalizing behaviors in students and classroom size and composition.

One way to address many of the limitations identified would be to have a replicable process that could be used in different geographic regions. Although my study

is easily replicated, by doing a regional process it would allow for the comparison of data across districts, communities and even more globally. This process would allow for the data to be examined as an aggregate, or disaggregate and ensure the sample size is large enough not only to generalize the results but also look at regional differences and biases that might exist with the use of emotional support dogs in classrooms. Further, this would ensure the sample has racial and socio-economic diversity. This process would also allow smaller districts to still be part of the sample even though their numbers are not necessarily representative of the larger population.

Another recommendation for future researchers would be to ensure the researcher is part of the initial data collection process; whether this is done in person or through video conferencing technology. Specifically, the researcher could meet with the district staff that are collecting and vetting the data as a scripted orientation process; the researcher could speak to the process and the importance of consistency within and throughout districts. This would ensure that district staff collecting the data are all given the same orientation and information. As well as speaking to the process of research, the researcher could ask the principal to fill out a survey instrument in regards to classroom size, composition, and teachers' style. This information would be helpful in determining if any of these factors influenced the results of the study while still being able to collect archival data.

Another important factor that I became aware of in my own research was the lack of consistency in operational terms and definitions used by researchers in the field. This is problematic as results from various studies are not easily compared if the researchers

did not use the same operational terms and definitions. One way to circumvent this is for future researchers to use the definitions put forward by Schoenfeld – Tacher (2017). Currently these definitions are being more widely adopted by researchers in this field and are used to identify the four main types of support dogs used in North American communities.

Finally, it is important for future researchers to determine whether the results of having an ESD program in classrooms only impacted the internalizing scores of anxiety, depression, and somatization, or whether there was an impact on externalizing scores for hyperactivity, aggression, or conduct problems. By understanding if externalizing scores were also impacted, it could strength the perception of the value of the ESD program, which could influence policy makers and education boards when considering program implementation.

Implications

This study serves to bring about positive social change by informing school districts of the benefits of an ESD program for children with mental health or behavioral difficulties. This is a program that can be implemented with very little cost to the district and using the existing internal structures of the district. Therefore, the additional costs and training are limited when compared to implementation of other universal programs in a district. Often universal programming includes professional development for teachers, new materials, and mentorship. Further, there is ongoing training as teachers are trained, and then move to another district or grade, which can result in the program being compromised.

As well as assisting children with mental health or behavior difficulties, an ESD program in classrooms can also assist with academic skills. Malecki and Elliot (2002) linked emotional regulation and academic success by finding that emotional regulation is a future index of academic success. Therefore, this program has the potential to help improve academic grades which improves outcomes of students (Malecki & Elliot, 2002; Roberts-Schneider, 2016). In addition to improving academic outcomes; this program also reaches students who do not have the emotional language to discuss their difficulties. These students often will not be identified as their classroom teacher does not recognize their level of struggle (Reynold & Kamphaus, 2015). The ESD program can also improve outcomes for these nonidentified students.

In summary, my research has the potential for positive social change by providing school districts with a much needed universal low-cost intervention that could assist students who struggle with anxiety, depression, and somatization. Further, not only could this intervention assist those who struggle, it may also act as an early identification and intervention process for students with social and emotional regulation difficulties, and those students yet to be identified. As well as enhancing social and emotional outcomes, research links ESD programs with increased academic skills (Malecki & Elliot, 2002; Roberts-Schneider, 2016). Not only does this program have the potential for positive social change, it is also an easy low-cost program for districts to implement that follows current policy and guidelines.

Conclusion

By conducting this study, I was able to ascertain that the use of an ESD classrooms for 2 hours per week for 24 weeks has a statistically significant impact on student's scores for internalizing behaviors including anxiety, depression, and somatization. This was significant when compared to the control group who did not receive the same intervention. Therefore, this study demonstrated that schools that use the ESD program are in fact assisting students to emotionally regulate and lower their scores for anxiety, depression, and somatization.

Crossman (2016) suggested that the big findings in this will not come from just on study but will be contingent on many well-done pieces of research. My research adds to the body of studies that confirm the quantitative benefits of ESD programs in school districts. Not only does my study add to the quantitative benefits of ESD programs in schools, it also assists with early intervention which has shown to influence positive outcomes for students (Malecki & Elliot, 2002; Roberts-Schneider, 2016). The ESD program is an effective early intervention program. The literature demonstrates that addressing mental health symptoms early in a student's academic career can allow students to learn the skills they need to manage internalizing difficulties, be successful in their academic pursuits, and give them the opportunity to create positive change within themselves. Impacting the positive development of these skills in students will make them contributing members of society and ultimately benefit the community they are a part of (Kens, Stuart-Parrigon and Coifman, 2018). More importantly, the use of ESD gives a voice to students that do not know how to advocate for themselves and their

mental wellbeing because they do not have the emotional language to convey their needs. The research I have conducted demonstrates that ESD can be used to help students meet their emotional needs without having to be identified or singled out by professionals before services become available to them. Overall this program allows universal access to student mental health support which creates healthier students, healthier schools, and healthier communities.

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Appendix: British Columbia Ministry of Education Category H Checklist

Students Requiring Intensive Behaviour Intervention or Students with Serious Mental Illness **Level 3 funding allocation** **1701 Code H** This checklist should only be used in conjunction with Section E.5 of *Special Education Service: A Manual of Policies Procedures and Guidelines (Nov. 2010)*	Student's Name _____ PEN _____ Date
To be eligible the following must be met	
Documentation includes: ❑ a behavioural assessment **and/or** ❑ a mental health assessment The behaviour or mental health assessment indicates evidence of **one or both** of the following: ❑ antisocial, extremely disruptive behaviour in most other environments and consistently/ persistently over time; **and/or** ❑ severe mental illness diagnosed by a mental health professional (psychiatrist, paediatrician, physician, registered psychologist specializing in this area).	There must be documentation to support that the student has been appropriately assessed and identified by the school district or independent school authority as meeting the criteria of the special education category. ❑ Functional behavioural assessment, for example, the Behaviour Disorders Instructional Support Planning Tool, **and/or** ❑ Other assessments by medical professionals or teams of professionals, **and/or** ❑ Norm referenced assessment, i.e., Behaviour Assessment System for Children (BASC), Connors' Rating Scale, Achenbach Child Behavior Checklist, etc.
There is documented evidence that indicates… The behaviour ❑ places student or others at serious risk **and/or** ❑ interferes with his or her academic progress and that of other students.	
There is documented evidence that … ❑ A current IEP is in place, dated after September 30, previous school year. ❑ The IEP has individualized goals and measurable objectives, with adaptations and or modifications where appropriate, and strategies to meet these goals. ❑ The goals correspond to the category in which the student is identified. ❑ The student is receiving special education services to address the needs identified in the assessment documentation that are beyond those offered to the general student population and are proportionate to level of need. ❑ The student is being offered learning activities in accordance with the IEP. ❑ The IEP outlines methods for measuring progress in relation to the IEP goals. ❑ A parent was offered the opportunity to be consulted about preparation of the IEP.	
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Students Requiring Intensive Behaviour Intervention or Students with Serious Mental Illness (Cont'd) **Level 3 funding allocation** **1701 Code H** This checklist should only be used in conjunction with Section E.5 of *Special Education Service: A Manual of Policies Procedures and Guidelines (Nov. 2010)*	Student's Name _____ PEN _____ Date
There is documented evidence that indicates… ❑ The settings in which the behaviour is persistent over time. ❑ The district or independent school authority has exhausted resources/ capacity to manage. ❑ Planning is coordinated, across-agency and community (integrated case management/ wraparound).	
Documentation of services shows that… ❑ The services outlined in the IEP relate to the identified needs of the student. ❑ ❑ There is evidence that one or more of the following special education services are provided: ❑ direct intervention in the classroom to promote behavioural change or emotional support as per IEP; and/or ❑ placement in a program designed to promote behaviour change/implement IEP; and/or ❑ ongoing, individual social skills training and/or instruction in behaviour/ learning strategies. Reduction in class size (or placement in an alternate program or learning environment) is not by itself a sufficient service to meet the criteria.	