# Daily Physical Activity as an Intervention Strategy for Anxious Elementary Students

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**Abstract**

The focus of this project was twofold: a comprehensive examination of provincially mandated, school-based physical activity programming beyond physical education, as well as an exploration of the potential relationship between school-based physical activity and student anxiety. The data were collected using a descriptive research methodology consisting of a qualitative document analysis of provincial government publications pertaining to school-based physical activity programming and the literature on the relationship between physical activity and student anxiety. The findings revealed inconsistencies between the Canadian provinces and territories in providing mandated school-based physical activity beyond physical education. It was also revealed that regular school-based physical activity has the potential to make a positive impact on students' lives in many ways. Students are living more sedentary lives, and evidence shows that regular physical activity could prevent and treat student anxiety.

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# CHAPTER ONE: INTRODUCTION TO THE PROBLEM

The focus of this master's research project was twofold: First, the study explored current school-based daily physical activity (DPA) initiatives that exist across Canada, and second, it identified and described whether a relationship exists between school-based physical activity and student anxiety.

## Background of the Problem

Throughout my university undergraduate career, I have developed a deep-rooted passion for the importance of physical education (PE) and its relationship with student mental well-being, especially its impact on student anxiety. My interest in the benefits of physical activity was sparked at an early age as I began to suffer from a generalized anxiety disorder. As an extremely anxious child, I experienced the consequences of being stressed, namely, the impact of stress on my happiness and ability to focus, which compounded and significantly affected how I performed academically. Throughout my elementary school years, I was given opportunities to participate in school-based physical activity, which in turn provided me an outlet to relieve such stress and anxiety. Such opportunities included frequent breaks from my deskwork, including sporadic repetitive movement or change of physical location during a lesson. Through these opportunities, I found that physical activity acted as a strategy to prevent and intervene with my debilitating anxiety within a classroom setting. But these opportunities were not always available for me, and consequently I suffered. I believe I would have benefited from more frequent and consistent physical activity throughout each school day, which could have been as simple as standing up and performing a stretching movement. As a result, the potential for

physical activity to act as a preventive mechanism to treat anxiety is of interest to me and therefore formed the impetus for this research project.

Through my experiences as a student in the Ontario public school system, I know how the lack of physical activity intervention strategies may potentially fail children who suffer from anxiety and stress; therefore, the intention of this master's research project was to look beyond PE as a means to intervene with anxiety, and to identify and describe other elementary curricular physical activity programs within Canadian provinces and territories. Further, I intended to explore the extent of the relationship between school-based physical activity and student anxiety.

Anxiety disorders are the most common of all mental health problems (Canadian Mental Health Association, 2012). The Canadian Mental Health Association (2012) estimates that anxiety disorders directly affect approximately one in 10 people. Although it may be impossible to eliminate such disorders, anxiety and stress can be managed. According to a recent study, about 14% of people make use of regular exercise to cope with stress (Anxiety and Depression Association of America, 2010). It is common for stress to manifest as anxiety since anxiety is a response to stress (Anxiety and Depression Association of America, 2010). Research has also shown "strong evidence . . . on the positive effects of physical activities on self-concept, self-esteem, anxiety, depression, tension and stress, self-confidence, energy, mood, efficiency and well-being" (Bailey, 2006, p. 397).

## Statement of the Problem

It is common knowledge among those who work with children that elementary schools students require exercise and need to move regularly

(Livingstone, Robson, Wallace, & McKinley, 2003). Unfortunately, however, children are becoming more sedentary as poor health choices are being made (World Health Organization [WHO], 2012). Not only does a sedentary lifestyle have implications for physical fitness per se, but it may also have profound effects on cognitive and psychosocial development (WHO, 2012). Because levels of participation in physical activity are decreasing among schoolchildren (Oliver, Schofield, & McEvoy, 2006), the importance of increasing physical activity is crucial. The benefits of regular physical activity for children include strengthened hearts, potentially improved academic performance and psychological well-being, and a significantly decreased likelihood of smoking, illicit drug use, and unwanted pregnancy during adolescence (Ophea, 2012). Coinciding with decreases in physical activity levels among children, evidence also suggests that children are actually experiencing an increase in mental illness; it can thus be concluded that such deficits to children's well-being can be attributed to an overall decrease in physical activity (Ophea, 2012). More recently, a growing body of literature has explored the negative effects of living a sedentary lifestyle, specifically for elementary school-aged children (Active Healthy Kids Canada, 2012).

Almost one half (49%) of people who feel they have suffered from anxiety have never sought outside help (Canadian Mental Health Association, 2012). In fact, in Canada, only one in five children who need mental health services receives them (Canadian Mental Health Association, 2012). I happen to be a part of the 80% who were not formally diagnosed with anxiety until childhood had long past. If school staff supported all students and provided them with tools to deal with such issues,

perhaps it would lessen the stigma of mental health and children would be more likely to thrive. Students and society value school-based physical activity to the extent that educational and political leaders perceive it to be of value. In Canada, education is a provincial or territorial responsibility, and each province and territory determines its own education agenda.

Some schools in Canada tend to view school-based physical activity as having lower priority in the school curriculum (DeCorby, Halas, Dixon, Wintrup, & Janzen, 2005). Where school-based physical activity is marginalized, children may be subject to potentially negative outcomes, such as lack of on-task behavior, trouble concentrating, and potentially increased rates of psychological disorders, all of which can negatively affect student academic achievement (Ontario Ministry of Education, 2005b).

## Purpose of the Project

The purpose of this project was twofold. First, it sought to identify and describe mandated Canadian provincial approaches to school-based physical activity beyond PE. Second, it aimed to explore the extent of the relationship between school-based physical participation and student anxiety. For the purposes of this project, I define school-based physical activity as any physical activity that is led by a teacher during the instructional day.

## Research Questions

The questions examined in this study were as follows:

- To what extent is there a relationship between school-based DPA and elementary student anxiety?

- Beyond PE, what school-based curricular physical activity programming currently exists in elementary schools in Canada?

## Scope and Limitations of the Study

A limitation of this project is that the data interpretation and analysis were limited to my personal experience and background. Because of the subjectivity of this project, interpretations of the data may vary. As the author of this project, I am aware that I have intentionally included bias throughout my reflections on my experiences.

## Outline of Remainder of the Study

This document includes four additional chapters. Chapter Two reviews the literature relevant to this study. Chapter Three outlines the methodology and procedures used for this qualitative content analysis. Chapter Four identifies and describes the results of the related literature by discussing the themes that emerged from the document meta-analysis. Finally, Chapter Five summarizes the project through discussing its implications. Recommendations for stakeholders to improve upon current DPA practice are included.

# CHAPTER TWO: REVIEW OF RELATED LITERATURE

The purpose of this chapter is twofold: first, to gain an understanding of what anxiety disorders are and how they affect children, and second, to highlight the role of physical activity in children's daily lives. To do this, I first look at the larger picture of the mental health umbrella to decipher what it means to be mentally healthy or mentally ill. Next, I explore the types, prevalence, and comorbidity of anxiety disorders, including factors that affect the onset of child anxiety. To understand the role of physical activity in children's lives, the literature review continues with an overview of school-based physical activity, which includes a description of how children are becoming more active in schools. Finally, the chapter concludes by examining potential factors that either act as barriers to participating in physical activity or encourage children to participate in physical activity while at school.

## Mental Health

There are multiple ways of defining mental health, and these definitions are constantly changing. For the purposes of this project, it will be understood that mental health involves not only avoiding serious mental illness, but also achieving a balance in all aspects of one's life: social, physical, spiritual, economic, and cognitive (Canadian Mental Health Association, 2012). Mental health has more recently been understood through a holistic approach. It is affected by numerous factors from daily life, including the stress of balancing work with physical health and relationships (Canadian Mental Health Association, 2012).

Similar to the human body needing to stay physically fit, a healthy mind is required to sustain a state of good mental health (Canadian Mental Health

Association, 2012). Mentally healthy individuals experience enjoyment in all aspects of daily life, including the environment and the people in it. Those who are mentally healthy are able to take risks and are not afraid to try new things. Mentally healthy people are generally able to cope with the challenges they may encounter in their personal or professional lives. For example, a mentally healthy individual will feel the emotions of sadness that may come with the loss of a job or similar devastation. But once a short time has passed, that individual will be able to get past the sadness and once again attain balance in his or her life. Although finding the balance after a sad episode seems reasonable and possibly inevitable, those who are affected by mental illness either have trouble finding the balance once again, or quite possibly are unable to regain their balance altogether (Canadian Mental Health Association, 2012).

## Mental Illness

Mental illness can be understood as an umbrella term for disorders that are characterized by alterations in thinking, mood, or behavior associated with significant distress and impaired functioning (Public Health Agency of Canada, 2002). Among the most common mental illnesses in Canada are mood disorders such as depression, bipolar disorder, and schizophrenia; anxiety disorders such as eating disorders; as well as personality disorders, problem gambling, and substance dependency (Public Health Agency of Canada, 2002). Although these mental illnesses may seem far removed from reality for some people, they are more common than once thought. One in five Canadians will experience a mental illness in his or her lifetime (Canadian Mental Health Association, 2012). The remaining four will have a friend, family member, or colleague who will have a mental illness. Mental illness affects

thinking, mood, or behavior and can be associated with distress and potential impairment of daily functioning. Symptoms of various mental illnesses can vary from mild to severe (Centre for Addictions and Mental Health, 2012). Mental illness affects people of all education levels, income levels, cultures, and ages (Public Health Agency of Canada, 2012). This project specifically explores childhood-onset mental illness, in particular anxiety disorders.

## Anxiety Disorders

Educators and those who work with children may find it of value to know that 70% of mental health problems and illnesses have their onset during childhood or adolescence (Centre for Addiction and Mental Health, 2012). Since anxiety disorders are the most common mental illness in Canada, the need to better understand them is critical for those working closely with this vulnerable population (Public Health Agency of Canada, 2002). Anxiety disorders affect behavior, thoughts, emotions, and physical health. It is believed that anxiety disorders are caused by a combination of biological factors, brain functions, and personal circumstances and experiences, along with social and economic factors (Health Canada, 2009).

Anxiety is a normal reaction that many people experience. It is very common to go through feelings of nervousness or uneasiness before a highly anticipated event, such as being in a wedding or writing an exam. An anxiety disorder, however, is diagnosed when various symptoms of anxiety create significant distress and, in turn, cause impairment to daily living (Public Health Agency of Canada, 2002). Anxiety disorders are chronic, sometimes debilitating, and can grow progressively worse if not treated. People with anxiety disorders often avoid situations that precipitate their

symptoms. This avoidance can seriously restrict education, work, recreation, and social activities (Public Health Agency of Canada, 2012). Effective treatments for anxiety disorders are available, and research is yielding new, improved therapies that can help most people with anxiety disorders lead productive, fulfilling lives (Health Canada, 2009).

Individuals with anxiety disorders experience excessive anxiety, fear, or worry, causing them to either avoid situations that might precipitate the anxiety, as noted, or develop compulsive rituals that lessen the anxiety (Public Health Agency of Canada, 2002). A person with an anxiety disorder may find it difficult to function in areas of life such as social interactions, family relationships, work, or school (Anxiety Disorders Association of Canada, 2007). People who are young and who experience excessive fear, worry, or uneasiness may have an anxiety disorder (Public Health Agency of Canada, 2012). Since an anxiety disorder left untreated can significantly depreciate a young person's quality of life, it is important that educators and those working with children understand how such disorders can be prevented or treated. A goal of this project is to uncover what exactly educators can do to help children who may be at risk for developing an anxiety disorder. But before that can be achieved, we must first know the types of anxiety disorders and acquire a deeper understanding of them.

**Types of Anxiety Disorders**

There are six main anxiety disorders in adults and seven in children and youth. These include (a) social anxiety disorder (extreme fear or avoidance associated with social or performance situations); (b) posttraumatic stress disorder (patterns of

flashbacks and other symptoms occurring in children who have experienced a psychologically distressing event, such as being abused, being a victim or witness of violence, or being exposed to other types of trauma such as wars or natural disasters); (c) panic disorder with or without agoraphobia (causes terrifying "panic attacks" that include physical symptoms such as a rapid heartbeat and dizziness); (d) obsessive-compulsive disorder (causes children to become "trapped" in a pattern of repeated thoughts and behaviors); (e) specific phobias (unrealistic and overwhelming fears of objects or situations); (f) generalized anxiety disorder (pattern of excessive, unrealistic worry that cannot be attributed to any recent experience); and (g) separation anxiety in children and youth (Anxiety Disorders Association of Canada, 2007).

**Prevalence of Anxiety in Children**

As noted, anxiety disorders are the most common of all mental health problems (Canadian Mental Health Agency, 2012; Health Canada, 2009). It is estimated that one in 10 Canadians is affected by an anxiety disorder (Health Canada, 2009). As many as 13 of every 100 young people have an anxiety disorder (Mental Health Canada, 2012), and roughly 6% of children and youth in Canada have an anxiety disorder serious enough to require treatment (Children's Mental Health Ontario, 2012). The disorder develops gradually and can begin at any point in the life cycle, although the years of highest risk are between childhood and middle age (National Institute of Mental Health, 2009). Without treatment, some anxiety disorders that begin in childhood can last a lifetime, although they may come and go (British Columbia Ministry of Children and Family Development, 2007).

Although quite common, anxiety disorders in children often are overlooked or misjudged, despite their being a very treatable condition when good, persistent medical care is present. Anxiety disorders in children often go undiagnosed for a number of reasons. First, there is the negative social stigma that is attached to mental illness. Second, parents may overlook their child's potential illness because of fear of being "labeled." Third, these disorders are often mistaken for mental weakness and instability. The social stigma attached to mental illness often prevents those with anxiety disorders from asking for help or prevents parents from seeking medical attention for their potentially ill child (Health Canada, 2009). Since anxiety disorders can be life-debilitating on their own, it is important that educators and those who work with children be aware that these disorders are often accompanied by other mental illnesses, which can dramatically increase the effects on children. For this reason, the comorbidity of anxiety with other mental illnesses will be explored next.

**Comorbidity**

People often suffer from more than one anxiety disorder, and those with anxiety disorders often suffer from more than one mental illness such as depression, eating disorders (anorexia or bulimia nervosa), attention deficit hyperactivity disorder (ADHD), schizophrenia, or substance abuse (Centre for Addictions and Mental Health, 2012). This is defined as comorbidity. Once recognized, anxiety disorders can be successfully treated, and the possibility of comorbid mental illness declines (Health Canada, 2009). Recent work has suggested that for primary care outpatients with comorbid anxiety and other mental illness, each disorder causes equal decrements of function (Aina & Susman, 2006). Thus, patients with clinically

significant comorbidity suffer the greatest functional and economic burden (Aina & Susman, 2006). Therefore, it is important to explore the comorbidity of anxiety and other mental illness.

**Anxiety and depression.** It is not uncommon for someone with an anxiety disorder to also suffer from depression, or vice versa. Nearly half of those diagnosed with depression are also diagnosed with an anxiety disorder (Anxiety and Depression Association of America, 2012). Hirschfeld (2001) found that between 10% and 20% of adults in any given 12-month period will visit their physician for symptoms of anxiety or depression; more than 50% of these patients suffer from a comorbid second depressive or anxiety disorder.

The presence of depression and anxiety comorbidity substantially increases utilization of medical resources. Additionally, there are barriers to treatment such as worsened psychiatric outcomes, including treatment resistance; increased risk for suicide; increased rates of recurrence, sometimes associated with greater chronicity; slower recovery; and greater psychosocial disability (Aina & Susman, 2006; Hirschfeld, 2001). Although recognition of individual depressive and anxiety disorders has increased substantially in the past decade, recognizing comorbidity still lags (Hirschfeld, 2001). It is often a challenge for physicians to diagnose both an anxiety disorder and a depressive disorder, since the distinctions between the two disorders are difficult to separate and symptoms often overlap (Aina & Susman, 2006). Also, anxiety disorders typically precede the development of depression, and since they are often comorbid themselves, attention must be given to properly treating the anxiety first to eliminate the possibility of depressive symptoms being confused

for a depression disorder (Aina & Susman, 2006). This is important, since effectively recognizing and treating anxiety and depression may be associated with functional improvement in the medical disorders. Paying careful attention to the development of anxiety and depression may also positively affect the economic burden of these disorders (Aina & Susman, 2006).

**Anxiety and eating disorders.** Anxiety disorders are significantly more frequent in subjects with eating disorders than in the general community. Researchers have shown that anxiety disorders often precede eating disorders, leading to the suggestion that early onset anxiety may predispose individuals to developing an eating disorder, much like depression (Swinbourne & Touyz, 2007). To date, however, the research presents strikingly inconsistent findings, thus complicating our understanding of eating disorders and anxiety comorbidity. Furthermore, despite indications of the prevalence of someone with an eating disorder also being at high risk for anxiety, more research in this area must be done (Swinbourne & Touyz, 2007).

On the other hand, more recent studies have suggested that the rate of comorbidity of anxiety and eating disorders is significant (Swinbourne et al., 2012). Recently, Swinbourne et al. (2012) investigated the prevalence of comorbid eating and anxiety disorders in women presenting for inpatient and outpatient treatment of an eating disorder, and women presenting for outpatient treatment of an anxiety disorder. They looked at the prevalence of comorbidity from a sample of 152 women (100 women presenting for an eating disorder, 52 for an anxiety disorder). Of those with an eating disorder, 65% also met criteria for at least one comorbid anxiety

disorder; moreover, 69% of these reported that onset of the anxiety disorder preceded that of the eating disorder (Swinbourne et al., 2012).

Similar results indicating strong rates of comorbidity in anxiety and eating disorders were seen by Kaye, Bulik, Thornton, Barbarich, and Masters (2004), who tested a sample of 672 individuals with anorexia nervosa, bulimia nervosa, or both for comorbid anxiety disorders. The rates of most anxiety disorders were similar in all three subtypes of eating disorders. About two thirds of the individuals with eating disorders had one or more lifetime anxiety disorders; the most common were obsessive-compulsive disorder and social phobia (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004). It may be interesting for those who work closely with children that most of the participants reported the onset of the anxiety disorder in childhood, prior to developing the eating disorder. People with a history of an eating disorder who were not currently ill and who never had a lifetime anxiety disorder diagnosis still showed symptoms of anxiety. The presence of either an anxiety disorder or an eating disorder tended to exacerbate these symptoms (Kaye et al., 2004).

**Anxiety and attention deficit hyperactivity disorder (ADHD).** Childhood ADHD is commonly comorbid with anxiety disorders, with estimated comorbidity rates of 20% to 40% (Jensen et al., 2001; Spencer, Biederman, & Wilens, 1999). Of the anxiety disorders, generalized anxiety disorder (GAD) is thought to be the most prevalent comorbid disorder, followed by social phobia and separation anxiety. Further, it is common for children with ADHD to be diagnosed with more than one anxiety disorder (Souza, Pinheiro, & Mattos, 2005).

When anxiety disorders present themselves in children who also suffer from

ADHD, the symptoms of ADHD change from what would be typical for a child with a noncomorbid diagnosis of ADHD (Faraone & Kunwar, 2007). Anxiety in ADHD may inhibit impulsivity, so children with ADHD and comorbid anxiety may have less impulsivity but more inattention. For this reason, it is possible to overlook ADHD (especially the inattentive type) in children with anxiety. Children with anxiety are often preoccupied with fears, which impairs their ability to focus on the task at hand. For anxious children without ADHD, their attention improves when their anxiety improves, whereas children with comorbid ADHD and anxiety will continue to struggle with inattention even in the absence of anxiety (Faraone & Kunwar, 2007).

Kaplan (2012) reported a recent study by McMaster University researchers Van Ameringen, Simpson, and Patterson that looked at the comorbidity of anxiety disorder with ADHD. They found that among 264 patients referred to an anxiety disorders clinic, there was a 37.5% prevalence of comorbid ADHD disorder (48.5% male, 51.5% female). The study suggested that the prevalence of ADHD diagnosis was higher in subjects who had an anxiety disorder than that found in the general population (Kaplan, 2012). Among the patients with ADHD, 93% had two or more comorbid mental illnesses (Kaplan, 2012). This finding is consistent with that of other studies explored throughout this chapter indicating the overlap of similar symptoms that go along with mental illnesses and comorbid anxiety disorders. It is important for children with ADHD to receive early recognition and treatment of ADHD, which may itself improve anxiety. Because significant numbers of children with ADHD have or will develop anxiety, all children with ADHD have to be monitored for symptoms of anxiety (Kaplan, 2012).

**Anxiety and schizophrenia.** Data regarding the co-occurrence of anxiety disorders in schizophrenia patients are scarce (Braga, Petrides, & Figueira, 2004). But despite the limited number of studies done in the past, recent research is being carried out on schizophrenia and potential comorbid disorders (Braga et al., 2004). More recently it has been found that many people diagnosed with schizophrenia also have a comorbid anxiety disorder (Pokos & Castle, 2006). In fact, research is showing that the prevalence of anxiety disorders among schizophrenic patients is higher than in the general population (Pokos & Castle, 2006). A meta-analytical study that reviewed the existing literature from 1966 to 2004 showed that anywhere from 30% to 85% of individuals with schizophrenic spectrum disorders (schizophrenia and similar disorders) had an anxiety disorder at some point in their lifetime. The research also showed that in at least half the patients studied, the anxiety disorder was present prior to the first schizophrenic episode (Pokos & Castle, 2006). This finding is consistent with anxiety disorders being present more often than not prior to a diagnosis of depression, an eating disorder, or ADHD.

Although the current body of literature is still far from allowing evidence-based conclusions about the details of the comorbidity of anxiety and schizophrenia, it does suggest that treating an anxiety disorder can potentially reduce the onset of schizophrenia and additional comorbid anxieties. Large studies with more in-depth assessments of treatment response and outcome are needed to clarify the relationship between anxiety disorders and schizophrenia and better understand the role of treatment in the onset and progression of the disorders (Braga et al., 2004).

Once again, it is very difficult to diagnose anxiety and schizophrenia as

separate disorders, since many symptoms of anxiety may appear spontaneously with schizophrenic symptomology (Pokos & Castle, 2006). Also, the anxiety may be a direct response to the psychosis, or it may come and go during a psychotic episode. Additionally, symptoms of anxiety can be a side effect of antipsychotic drugs prescribed for schizophrenia (Pokos & Castle, 2006).

**Factors Affecting Childhood-Onset Anxiety**

Although researchers do not know exactly why some people experience anxiety disorders, they do know that various factors are involved. Like many other mental illnesses, anxiety disorders have complex origins and are a result of a combination of biological, psychological, and other individual factors (Canadian Mental Health Association, 2012).

It is likely that genetics and biology play a role in causing anxiety. It has been found that the children of adults with anxiety disorders are at much greater risk of an anxiety disorder than the general population. For example, some children learn to be anxious from a role model, such as watching their parents model behaviors that lead to anxiety disorders. Numerous studies have also confirmed that neurotransmitters in the brain, such as serotonin and norepinephrine, combined with hormonal factors, can influence the onset and course of anxiety disorders (Public Health Agency of Canada, 2009). Although biological and psychological factors are a possible cause of anxiety, the environment can also play a key role in determining instances of anxiety disorder. For example, the home, neighborhood, school, and other settings can contribute to anxiety. Children may develop anxiety as a product of their environment, such as a stressful family life or bullying at school. Further, it has been found that Canadians

in the lowest income group are 3 to 4 times more likely than those in the highest to report fair-to-poor mental health (Centre for Addictions and Mental Health, 2012). In most children and young people, a variety of causes lead to an anxiety disorder (Children's Mental Health Ontario, 2012).

As previously mentioned, anxiety disorders commonly occur along with other mental illnesses, including alcohol or substance abuse, which may mask anxiety symptoms or make them worse. In some cases, these other illnesses need to be treated before a person will respond to treatment for the anxiety disorder (National Institute of Mental Health, 2009).

## School-Based Physical Activity

Schools continue to be potentially the most ideal site for children to be physically active (National Center for Chronic Disease Prevention and Health Promotion, 2009). While at school, children are exposed to a physical environment that is conducive to opportunities that are rich in space, resources, and time. Participating in physical activity often takes place at school since children over age 5 spend most of their day on school property. Schools are generally large, safe spaces that have both indoor and outdoor areas. Depending on board funding and administrator values, schools generally have a fair amount of resources to aid students in participating in physical activity, such as equipment and teacher knowledge. Schools therefore act as a site for physical activity opportunities, and these opportunities come in a variety of curricular and interscholastic venues (Ophea, 2012).

The level of physical activity in a child's life is often a fair predictor of future

participation in physical activity as an adult (Bates, 2006). Ever since the climb in rates of physical illness and disease resulting directly from a lack of physical activity, among other factors, it is crucial that children have a variety of opportunities to gain confidence and build skills in physical activity at an early age.

The benefits of school-based physical activity are bountiful, and some have previously been mentioned. The Canadian Association of Principals has stated that children who receive an appropriate amount (at least 150 minutes per week) of PE come to class "ready to learn" and demonstrate improved concentration and memory, enhanced creativity, and better task performance and problem-solving skills (Ontario Ministry of Education, 2006a). Academic performance is enhanced by increasing a student's level of habitual physical activity, despite a reduction in curricular or free time for studying academic material (Shephard, 1997). Since the benefits to participating in physical activity in school seem bountiful, it would be ideal to uncover the ways in which children are being physically active in schools and the reasons why they may not be getting active.

**Ways Children are Becoming Active in School**

Students are becoming physically active in schools in a variety of ways. At the elementary level, for example, students may be exposed to physical activity through compulsory PE curricula, through the integration of physical activity across subject disciplines, as well as through interscholastic opportunities and intramural team sports.

PE is positioned similarly across the provinces of Canada. All Canadian provinces have an elementary PE curriculum that mandates a minimum of 60 minutes

spent in the subject area each week. The mandate of a 60-minute minimum per week is consistent, although it is more common to expect approximately 150 minutes of PE each week for Grades 1 to 7 (Canadian Association for Health, Physical Education, Recreation, and Dance, 2006).

Apart from children being physically active in PE class and through integrating physical activity into other subject disciplines, there are also numerous ways in which children participate in voluntary physical activity while at school. For example, students may choose to participate in intramurals and in before- and after-school programs, including interschool athletics. Sometimes trained teacher professionals facilitate these programs, other times nonstaff members. Recess also provides an opportunity for children to engage in free time in which they are welcomed and encouraged to participate in physical activity, although that is not always possible (e.g., in poor weather conditions). Because physical activity is not always possible outside curricular instructional time, and since PE does not necessarily take place each school day, it is important for educators to find a way to ensure that children are participating in physical activity daily. Recently, some Canadian provinces have made efforts to implement physical activity across the curriculum to ensure that students are being physically active at some point during instructional time. In Chapter Four, such programming will be explored in further detail. For now we turn our attention to the potential barriers to student participation in school-based physical activity.

**Barriers Affecting Student Participation**

There are many barriers that affect or influence student participation in

school-based physical activity, which Morgan and Hansen (2008) have classified as being either institutional (outside the teachers' control) or teacher related (arising from the teachers' behavior). Some institutional barriers to elementary student participation in physical activity include budget constraints, scarce resources, reductions in time provided in the curriculum, the absence of professional development, the crowded curriculum itself, and a lack of facilities or equipment (Morgan & Hansen, 2008). Similarly, Dwyer et al. (2003) reported that the three major institutional barriers identified by generalist elementary teachers in Canada to providing a curriculum capable of meeting health and PE guidelines were the lower priority given to PE, the absence of performance measures for PE and activity, and insufficient infrastructure.

On the other hand, there are also many teacher-related barriers that affect student participation in physical activity. Such barriers include teachers (a) possessing low levels of confidence or interest in teaching PE, (b) being unable to provide safely planned and structured lessons, (c) having had negative personal experiences in PE, and (d) lacking the training, knowledge, expertise, and qualifications to provide PE (DeCorby et al., 2005; Morgan & Hansen, 2008). Although institutional and teacher-related barriers do exist and may prevent students from participating in physical activity, there are also factors influencing active participation by children regardless of potential barriers.

**Physical Activity and the Participating Student**

Apart from the many barriers affecting student participation in physical activity, there are also many positive factors. For example, for many children

physical activity is an escape from the typical sedentary classroom instruction and allows for a kind of freedom to explore and use imagination and play (WHO, 2012). Physical activity can offer a site for positive socialization with friends or peers from different classes and grades (WHO, 2012). Physical activity is often fun for students and teachers alike. Apart from the mentioned physical health benefits to being physically active in schools, there are also a number of psychological benefits involved with regular physical activity. Students may be encouraged by their parents or teachers to participate in interscholastic or intraschool physical activity opportunities to help them meet new friends or to capitalize on the important benefits of being active regularly (Barrett, 2012).

Overall, we see that many factors, both positive and negative, influence student participation in school-based physical activity. Since there is no evidence to suggest that physical activity is harmful to student well-being, it is important that it not be overlooked. What is undeniable is the research suggesting the infinite benefits to being physically active as an adult and, more importantly, as a child. Parents and teachers must understand the barriers to student participation in school-based physical activity so that students can become better equipped to experience its benefits.

## Conclusion

Chapter Two has provided an overview of necessary information to gain a basic understanding of anxiety disorders and how they may affect children. The types of anxiety disorders were explained as well as the prevalence of such disorders. This chapter also looked at the prevalence of comorbid disorders for children with anxiety, the most common of which were found to be depression, eating disorders, ADHD,

and schizophrenia. Several factors affecting the onset of anxiety disorders in children were then explored. In addition, school-based physical activity, examining specifically the ways students are becoming active in schools and the barriers they may face in participating in physical activity, were looked at. The chapter concluded with a description of factors that positively affect a child's participation in physical activity.

## CHAPTER THREE: METHODOLOGY AND PROCEDURES

The focus of this project is twofold. First, the study explores current school-based DPA initiatives existing across Canada. Second, it also identifies and describes the extent of the relationship between school-based physical activity and student anxiety. To begin exploring these focuses, the previous chapter conducted an initial literature review first to gain a more comprehensive understanding of what anxiety disorders are and how they affect children, and second to highlight the role of physical activity in children's daily lives. To do this, I examined the larger picture of the mental health umbrella and deciphered what it means to be mentally healthy or mentally ill. Chapter Two also explored the types, prevalence, and comorbidity of anxiety disorders, including those factors affecting the onset of childhood anxiety. To understand the role of physical activity in children's lives, an overview of school-based physical activity was also provided, including a description of how children are becoming active in schools. The chapter concluded with a discussion of potential factors that either act as barriers to participating in physical activity at school or simply encourage children to participate.

To move forward from the information presented in the project thus far, it is necessary to organize and present information from curricular documents in order to gain insight into how Canadian provinces differ in how they are getting children to become active in schools. But this information does not complete the picture on its own. For the first phase to have a purpose, it must be followed by a second phase grounded in relevant current research. Therefore, for the second phase I have chosen to look at the growing instances of anxiety disorders in children and the possible

relationship between childhood-onset anxiety and physical activity.

I hope that after reading this chapter, the reader will understand how the findings and subsequent implications and conclusions were derived. The goal, therefore, is for the information presented in this project to shed light on the potential for schools to be a site for both preventing and treating anxiety through implementing regular school-based physical activity. The particular target audience of this project includes educators, policy makers, and administrators, and in general people who work with children. It is the intent of this project to show that supporting research exists suggesting a relationship between levels of DPA exposure and levels of child anxiety. I wonder whether schools can be a site for intervention, not only for those with diagnosed anxiety, but also for those who may have less severe or undiagnosed anxiety.

As a consequence of my interest in the relationship between child anxiety and school-based physical activity beyond PE, I chose to examine what is happening in elementary schools across Canada in terms of student physical activity. I decided to look specifically at what school-based physical activity looks like for elementary students because when I was a child in elementary school, I suffered from anxiety when physical activity was not available. Also, this particular age group is often when the onset of mental illness, and specifically anxiety, begins to develop. It is hoped that if anxiety can be prevented during childhood, perhaps instances in adults will also be lessened.

## Method

To examine the extent of the relationship between school-based physical

activity and anxiety, I used qualitative research methods. This involved looking at curricular school-based physical activity programs across Canada. Next, I collected and examined relevant research pertaining to childhood-onset anxiety.

This qualitative study is consistent with what Creswell (2009) considered a content document analysis. This kind of research is used to describe the methodology of document analysis and its relevance to policy development and reform (Blundell, 2012). It is hoped that the data collected will be used in the future to generate data for a larger study. Policy analysis relies on specific research strategies designed for gathering and evaluating information. There is a need to better understand the methodology behind various forms of qualitative research such as document analysis. The documents analyzed in this study included provincial/territorial government documents related to physical activity, as well as relevant literature on current research linking physical activity to elementary school-aged children's levels of anxiety.

As the "inquirer," I collected multiple forms of secondary data and spent considerable time gathering information (Creswell, 2009). The collection procedure included looking through Canadian public documents such as elementary provincial/territorial school curricula and nonmandated initiatives. Such initiatives are programs that some provincial governments have issued as provisions and guidelines to healthy living and serve merely as guidelines with recommendations for ideal amounts of physical activity. They are not mandated or upheld by a governing body and lack the accountability of stakeholders. Some examples of nonmandated initiatives explored in this project include the Yukon Active Living Strategy

(developed in March 2000) by the Yukon Territorial Government and the Recreation and Parks Association of the Yukon (RPAY). Similar is Saskatchewan's province-wide movement In Motion, which aims to increase physical activity for children and youth. In Motion includes a DPA manual used as a resource for stakeholders in children's health, namely, schools, families, and the community (Saskatchewan in Motion, 2010). These programs all stress the importance of increasing levels of DPA for children. Along with school-based physical activity curricula and the mentioned nonmandated initiatives, government-initiated programming was also deconstructed and described. The Canadian nonprofit organization ParticipACTION (2012), which is similar to RPAY (2000) and In Motion (2010), is a program created to target communities, teachers, and parents to get children to become more physically active.

There are many advantages to using a content document analysis for this type of data collection. First, by collecting information through public provincial DPA and PE curricula documents, I was able to obtain the language and key words that best define and describe physical activity mandates. Since most of the documents I looked at are available to the public, I was able to access them at times convenient for myself (unobtrusive source of information) and to access Canadian provincial/ territorial government documents unlimited numbers of times. Since some of the documents used for this project were developed, issued, and mandated by the provincial government, it can be assumed that a lot of time and energy went into researching, planning, and developing the curricula. Another advantage to using secondary data sources such as provincial/territorial curriculum documents for collecting data is that as written evidence, I potentially saved the time and expense of

transcribing empirical data.

Along with the many benefits of using secondary data source documents as my data collection type, there were also limitations. First, not all people are equally articulate and perceptive. Also, it is possible that some information that could have been useful to my project may be protected information unavailable to public or private access. If this was the case, I would try to access the needed document via the Brock University library server, which is protected with a student username and password. If Brock did not pay for access to a certain document or journal, then I would move on and try to find the information elsewhere, such as the Western University library website or Google Scholar.

As the researcher, I was sometimes required to search out information in hard-to-find places. For example, many government websites have links to public documents that simply do not work or that incorrectly reroute the document search. To overcome challenges such as these, I had to spend more time than anticipated in playing around and going back and forth, trying different links and keyword combinations to try to find what I was looking for. Another drawback to qualitative document analysis is that this type of data collection required me to optically scan for computer entries. I spent most of my time on my personal laptop on the Internet, which was sometimes challenging because I am visually impaired and get headaches when I stare at the screen for too long. I also required different changes in scenery when researching on my laptop for long periods of time, so I had to physically transport my laptop to public libraries and coffee shops. This was both expensive and time consuming, especially when there was a charge for Internet access. Another

issue that arose was that some of the documents needed to complete the data collection were found to be either outdated or simply not available in their entirety online. Although such limitations did arise, I was able to move forward and overcome these relatively insignificant obstacles by looking for credible websites that did have the appropriate information or documents in full.

## Quality Issues in Qualitative Research

Several rules governed the analysis of the mentioned documents. For this particular study, the methodological work was grounded in trustworthiness (Lincoln & Guba, 1985). The aim of trustworthiness in a qualitative inquiry is to support the argument that the inquiry's findings are "worth paying attention to" (Lincoln & Guba, 1985, p. 290). In any qualitative research project, four issues of trustworthiness demand attention: (a) credibility (confidence in the "truth" of the findings); (b) transferability (showing that the findings are applicable to other contexts); (c) dependability (showing that the findings are consistent and could be repeated); and (d) confirmability (a degree of neutrality, or the extent to which the findings of a study are shaped by the respondents and not researcher bias, motivation, or interest; Lincoln & Guba, 1985).

### Credibility

Credibility is an evaluation of whether the research findings represent a "credible" conceptual interpretation of the data drawn from the participants' original data (Lincoln & Guba, 1985, p. 296). To establish that the findings in this project were credible, I employed three techniques: triangulation, member checks, and colleague debriefing. Triangulation involves using multiple data sources in an

investigation to produce understanding. This was achieved throughout the study as different search engines were used and peer-reviewed journal articles were cross-examined with different authors. This was done to ensure that the data collected were rich, comprehensive, and well-developed so that I had a deeper understanding of them. Similar to triangulation, I also conducted member checks to ensure credibility in the sources used to collect the data. As Lincoln and Guba (1985) discussed, this is potentially the most crucial technique for establishing the credibility and validity of data. To employ such a technique, I had to confirm my findings and interpretations of the data with members of those groups from whom the data were originally obtained. This involved emailing and using the telephone to contact those administrators responsible for designing and implementing physical activity curricula and programming. This process was rather informal and occurred during the course of the entire data collection process.

Another way to ensure credibility was to debrief my findings with peers and colleagues. This process involved exposing the research that I was finding to my sisters and peers who were disinterested in the subject material for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within my thoughts (Lincoln & Guba, 1985). Through doing this I was able to uncover my biases, perspectives, and assumptions.

**Confirmability**

Confirmability is a measure of how well the inquiry's findings are supported by the data collected (Lincoln & Guba, 1985). I relied on a skilled research advisor to help guide my research (Lincoln & Guba, 1985). My research advisor, Dr. Joe

Barrett, is an assistant professor in the Department of Teacher Education at Brock University. His work and research interests are situated within this field of study. More specifically, Dr. Barrett's research interests and experiences involve school-based health education, DPA, teacher self-efficacy in health and physical education (HPE), teacher–coach role conflict, physical and health education teacher education, analogy learning, HPE teacher identity discourse, and Aboriginal teacher education. Dr. Barrett is also familiar with grounded theory methodology and qualitative research in general and has employed such methodology in his own research. After I completed my data analysis and wrote the bulk of Chapters Four and Five, my advisor thoroughly examined my data analysis documents. Dr. Barrett assessed both the dependability and confirmability of the data used in the project based on established precedent in qualitative research, as well as the credibility and subjectivity of the evaluated documents collected and analyzed.

## Data Collection

The data for this project were collected in two phases. Both Phase 1 and Phase 2 of the data collection are described below.

### Phase 1 Data Collection

The purpose of Phase 1 of the data collection was to find out how children are becoming active in schools. More specifically, the goal was to establish what school-based curricular physical activity programming currently exists in elementary schools in Canada beyond PE. To find such material, I collected information on mandated school-based physical activity programs in elementary schools across Canada. Once this was achieved, I examined government-funded physical activity initiatives as well

as current elementary school PE requirements. I chose to structure the data in this fashion because it made sense to me to search for data in this order. To conceptualize these data, I needed to first understand what curricula were in place. By doing this I was able to determine where the provinces and territories have inconsistent curricular requirements. Next, I wanted to know if other programming was in place in lieu of, or in addition to, DPA and PE requirements. This was accomplished by accessing the provincial/ territorial government websites to find the details of the mandated curricula currently implemented in the respective elementary schools.

To locate the most current provincial curricula, I conducted a basic Google database search that directed me to each provincial website where the curricular documents were available for download. Databases were utilized through the Brock University library website as well as through Google Scholar. Data collection was limited to publications searched in English that were related to mandated school-based physical activity programming beyond PE.

**Phase 2 Data Collection**

The purpose of Phase 2 was to explore the extent of the relationship between school-based physical activity and elementary student anxiety. Compared with Phase 1, I followed a different process in Phase 2. First, I found well-documented information regarding anxiety using search engines, including Google Scholar and those of the Brock University library. To do so, I entered specific terms to find relevant material on the relationship between physical activity and anxiety. For example, search terms included *child, anxiety, physical activity, mental health, mental illness, adolescent, child-onset, comorbid, prevention, treatment,* and *Canada*. When

using these search terms, I noticed a pattern in the online journal databases that included the relevant articles and studies. For example, many of the articles used to collect data were from the American Psychological Association, the *Journal of Developmental & Behavioral Pediatrics, Measurement in Physical Education and Exercise Science, Journal of Clinical Child Psychology, Pediatric Exercise Science, Developmental Psychology, Journal of School Health, Canadian Journal of Public Health,* as well as the Government of Canada websites.

The data collection was initially supposed to be limited to peer-reviewed journal articles; however, some news articles and medical center websites were found to be helpful in providing missing links or to confirm data found elsewhere. The documents searched included information from Canada as well as across the globe. The documents reviewed were also fairly recent, since I did not include information from any source prior to 2000; although some sources referenced were originally written prior to that year, they have since been updated. Overall, the data collection was inductive in nature, since when I began my research by typing in different combinations of search terms, I did not know what I was going to find or how the literature may contradict or coincide with other data collected. The search for documents and peer-reviewed journal articles, therefore, was fairly open-ended, since I did not have a concrete vision of what my research would look like, how I was going to organize the data collected, or what conclusions would be derived through vigorous analysis of the data.

## Data Analysis

Data analysis, whether qualitative or quantitative, requires a researcher to

identify patterns and themes in the collected study data. This is a complex task, especially with qualitative data, which are nonnumeric and usually in a textual or narrative form. Making sense of a mass of qualitative data is a fascinating but time-consuming process. A smart research strategy helped bring order to the data without my getting bogged down in the process since the scope of the literature reviewed was quite extensive.

For this project it was most useful to employ a qualitative document analysis, first because I was unable to find one of this nature. In searching the Internet, I did not come across any one document that clearly defined physical activity across Canada; more specifically, there were no documents outlining how elementary school-based physical activity was handled across the Canadian provinces and territories. As a starting point in the process of deconstructing the data, I had to delineate the information into similarities and differences in school-based physical activity programming among the provinces, since an up-to-date, easy-to-understand document of this kind did not exist. Since the public can access government curricula online, it can be generalized that anyone is able to go onto a provincial or territorial government website to learn how elementary school-based physical activity is handled. Although the requirements for PE may differ slightly throughout Canadian elementary schools in elements such as time allotment and teacher specialization, they are fairly consistent from one jurisdiction to the next. From my initial research, I did not come across any document looking at the differences between the provinces. Further, beyond PE there appears to be a grey area in what each province or territory decides to do differently in terms of providing elementary students with other forms

of mandated school-based physical activity programming. One must dig deeper to understand what is being implemented or recommended in each jurisdiction and for what purpose. As suggested by Blundell (2012), a document analysis is a valid research strategy with considerable merit as a method for policy evaluation and reform. It is for these reasons that a qualitative document analysis could therefore be used in this particular study.

The data analysis was completed in a similar fashion to how the methodology was explained for the data collection. It was useful to break the data analysis into two phases in order to divide the distinct focuses of the project.

**Phase 1 Data Analysis**

Phase 1 included a comprehensive literature review that acted as a meta-analysis of relevant documents, such as the provincial/territorial government-mandated curricular and public physical activity initiatives already mentioned. A qualitative document analysis is a critical and in-depth evaluation of previous research and needed to be performed in order to compare and contrast existing physical activity curricula. The document analysis served as a summary and synopsis of a particular area of research, allowing anybody reading this paper to establish why I was pursuing this particular research (Creswell, 2009). As with most qualitative document analyses, it involves a process of gathering information from other sources and documenting it, although few have any idea how to evaluate the information or how to present it (Creswell, 2009). Although Creswell (2009) pointed out some holes in this as a method of quality research, in response to these challenges I structured my analysis in a way that allowed the information to be easily evaluated. For example,

the chart that I created with appropriate headings permitted the data found from each province or territory to be easily placed in a defined category, so that when every location had the appropriate information in each relevant box, one could visually see the similarities and differences across Canada.

For the purposes of the data analysis, Phase 1 included comparing and contrasting the mandated DPA currently used in Canadian elementary schools. To first organize the collected data, I entered the information from each province and territory into the self-designed information chart. Specifically, this involved applying the process adapted from the conventional analysis strategy described by Hsieh and Shannon (2005) so that I could analyze manually the physical activity curricular documents of interest from each province or territory. To then identify key themes and relationships, I needed to enter the data into the generated chart for each provincial or territorial document.

This chart included headings that enabled me as the researcher, or inquirer, to easily compare and contrast certain aspects of school-based physical activity. Such headings included the name of the province, program structure, key features, target audience, location of the school-based physical activity program, reasoning behind the mandate, assessment of students in school-based physical activity, and instructional time. These particular headings helped me decipher the similarities and differences across the programs. Now that I had sorted the data into an organized table, I continued to read over additional data to further refine themes and identify commonalities and differences across the data sets.

**Phase 2 Data Analysis**

Phase 2 of the data analysis involved comparing and contrasting the information gathered in the second phase of the data collection in paragraph form. Specifically, I was attempting to identify and describe the extent of the relationship between school-based physical activity and student anxiety. To do so I described the findings and made suggestions to stakeholders concerning future policy frameworks.

This part of the analysis used the data collected from Phase 2, when I examined the literature with the key terms mentioned, to describe the current research and determine whether there was evidence suggesting that school-based physical activity could be used as a tool to prevent or treat child anxiety. Once again, this kind of data analysis was inductive, meaning that I did not know where I was headed or what I would find when I began analyzing the data. In general, I examined a wide body of research and used thematic analysis once I had gathered all the articles and mined through the data, looking to identify themes in order to show connections between the two concepts of anxiety and school-based physical activity. To identify the relationship between the two, I established the recurring themes of gender, age, and social economic status and organized the data under each theme to explore further. I chose these three particular themes because they were aspects or factors in anxiety and school-based physical activity that continually emerged throughout the body of research I found.

Overall, it is understood that a content document analysis such as this is valuable for collecting qualitative data. Because of the wide variation in documents, I needed to make some minor modifications when applying the developed methodology to other types of document sources. Although an element of reader

interpretation still existed, I did my best to remain objective during the data collection and analysis process. As mentioned by Creswell (2009) and Lincoln and Guba (1985), document analysis is a valid research strategy with considerable merit as a methodology for policy evaluation, or in this case, government document deconstruction. This chapter reviewed exactly how the research began, starting with the methodology used, the way the data were collected, and an overview of how the data would be analyzed and for what purposes. The next chapter sets out the literature on current Canadian school-based physical activity programming as I attempted to explore the extent of the relationship between school-based physical activity and student anxiety.

# CHAPTER FOUR: PRESENTATION OF RESULTS

The purpose of this research was to explore the extent of the relationship between school-based physical activity and student anxiety. This chapter presents the findings that emerged during the examination of this qualitative study. Consistent with the data collection process mentioned in Chapter Three, the presentation of findings in this chapter also involves two distinct phases. In Phase 1, the data collected reviews the current school-based physical activity programming that exists in elementary schools across Canada. Phase 2 then presents the findings from the literature based on the relationship between physical activity and anxiety. Quantitative and qualitative data were analyzed to identify and organize emerging themes. Such themes that were found to occur repeatedly in the literature, and therefore are included in organizing this chapter, are DPA across the provinces; PE across the provinces; physical activity and anxiety; and physical activity, anxiety, and levels of academic achievement.

## Findings

The findings from Phase 1 and Phase 2 of the research are described in this section.

### Phase 1 Findings

This section presents the findings on mandated provincial/territorial approaches to school-based PA. As the analyses of the data evolved in Phase 1, I chose to categorize the data first by DPA, and second by PE across the provinces.

**DPA across the provinces.** Because levels of participation in physical activity are decreasing (Oliver et al., 2006) among schoolchildren, a variety of health-

related issues such as obesity, heart disease, and type 2 diabetes are on the rise. To counteract the health risks of physical inactivity among elementary students, some provincial governments across Canada have implemented programs referred to as daily physical activity (DPA). Some provinces have incorporated their DPA frameworks into policy; however, many frameworks remain as preliminary recommendations only. Essentially, DPA is an intervention to encourage increased levels of physical activity in elementary school-aged children. Sometimes DPA is mandated during instructional time, while it can also be flexible, occurring during noninstructional time or even in the community and at home. The Ontario Ministry of Education (2006a) indicated that ongoing DPA can support elementary students by improving and maintaining their health and wellness, as well as enhance learning opportunities.

Many studies have suggested that DPA increases students' overall well-being, specifically in the three domains of emotional, physical, and cognitive health (Calfas & Taylor, 1994; Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Shephard, 1997; Tremblay, Inman, & Willms, 2000). For example, the Ontario DPA memorandum indicated that specific desired outcomes included "improvements in achievement and readiness to learn, increased self-esteem, decreased rates of childhood obesity and long-term adoption of regular physical activity behaviours" (Ontario Ministry of Education, 2004). Evidently, regular physical activity can have a positive impact on students' physical, mental, and social well-being. But even though the health benefits of physical activity for children are apparent, DPA has not been implemented across all provinces in Canada. The following sections examine the existing DPA

frameworks as they currently exist within each province, if at all.

***British Columbia.*** According to a news release issued by ActNow BC, the cross-government initiative of the British Columbia Ministry of Education to promote health, British Columbia (BC) has the highest school health standards in Canada addressing the issue of childhood obesity (British Columbia Ministry of Education, 2007). ActNow BC claims that BC has Canada's most aggressive initiative yet to fight obesity as a result of rigid DPA requirements implemented in its elementary public schools (British Columbia Ministry of Education, 2007). Specifically, the DPA mandate in BC is designed to help develop three key prescribed learning outcomes, namely, student endurance, strength, and flexibility. These activities are shown to contribute in turn to positive physical, mental, and social well-being (British Columbia Ministry of Education, 2011a). Keeping in mind local circumstances, student age, and physical capabilities, DPA is implemented for 30 minutes during instructional or noninstructional time each school day from kindergarten to Grade 7. Structured and free-play activities in which students participate during recess, lunch, and after school count towards the mandated DPA as long as the activities are supervised by a responsible adult (British Columbia Ministry of Education, 2011a). The variations in daily time allocations differ ever so slightly across the spectrum of mandated DPA programming. Students in half-day kindergarten are required to receive 15 minutes of DPA. Students in full-day kindergarten through to Grade 7 should be given the opportunity to participate in the full 30 minutes of DPA per school day. This can be done in blocks of at least 10 minutes at a time, totaling a minimum of 30 minutes per day, or in one 30-minute block (British Columbia

Ministry of Education, 2011a). The DPA mandate offers greater flexibility at the senior intermediate grade levels, allowing teachers to meet the DPA provision requirements either on a daily basis or through a series of activities across a week for a total of 150 minutes of DPA.

In BC, the accountability practices built in to ensure that DPA is being delivered rest with the boards of education and school authorities (British Columbia Ministry of Education, 2011a). The school boards and authorities in BC have the autonomy to use school time (i.e., instructional and noninstructional) as they see fit to implement school-based DPA. They are responsible for developing implementation guidelines and reporting the attainment of the DPA requirements to parents via provincial report cards (British Columbia Ministry of Education, 2011a). The DPA *Program Guide* (2011) from the British Columbia Ministry of Education does not distinguish the direct roles and responsibilities of principals and teachers in implementing and reporting DPA (British Columbia Ministry of Education, 2011a).

***Alberta.*** In September 2005, Alberta introduced a DPA mandate for public school students in Grades 1–9 (Alberta Education, 2006). Similar to BC, the Alberta DPA mandate implements 30 minutes of DPA per school day for students in Grades 1 through 9 (Alberta Education, 2006). Alberta's DPA curriculum takes into account a student's ability and consequently varies in form and intensity. Similar to the BC provincial mandate, school authorities have the flexibility to implement DPA during instructional and/or noninstructional time. The mandated DPA requirement can be fulfilled in regular PE classes. But if DPA is offered at a time other than regularly scheduled PE, it should be given in as large a block of time as possible. DPA can

therefore be broken into multiple segments during the day, for a minimum of 30 minutes per day. For example, it can be done in two 15-minute blocks of time a day, as long as it adds up to a combined 30 minutes total. DPA can also be incorporated throughout the day and effectively integrated across curricular disciplines (Alberta Education, 2006). In the province of Alberta, DPA allows for student choice, since the intent is to increase students' physical activity levels so they are better able to learn. Further, the Alberta Education DPA handbook (Alberta Education, 2006) suggests that to promote student motivation and active participation in DPA, students must be part of the decision-making process when it comes to choosing DPA instruction and activities. As stated by the strategy plan of the Healthy Alberta School Communities, DPA is implemented with the intent to help develop the positive habits needed for a healthy, active lifestyle (Alberta Education, 2006). Stakeholders such as teachers, principals, parents, and members of the community are accepting of the DPA mandate and support such an initiative (Chorney, 2008).

A review of the provinces in Canada who have mandated DPA programming shows that Alberta Education was the only ministry that publicly posted for its constituents the amount of provincial funding that annually supports the provision of DPA. In Alberta, funds of $1.2 million annually go to school authorities to help support implementing DPA (Alberta Education, 2008).

Both Alberta and BC allow teachers to deliver DPA through already-mandated PE programming (Alberta Education, 2008; British Columbia Ministry of Education, 2011b). This feature is not one shared by the province of Ontario. In Ontario, required DPA programming must take place outside of and in addition to

mandated PE programming (Ontario Ministry of Education, 2005a). The Northwest Territories and Nunavut, on the other hand, uphold the same mandated curricular expectations for both regular PE and DPA as the DPA requirements for Alberta.

***Ontario.*** As with BC and Alberta, the Ontario Ministry of Education supports and promotes student participation in school-based mandated DPA (Ontario Ministry of Education, 2005a). On October 6, 2005, the Ontario provincial government introduced DPA policy memorandum Number 138, which mandated that all students from kindergarten to Grade 8 receive 20 minutes of moderate-to-vigorous physical activity during instructional time. This mandate was implemented as part of Ontario's "healthy schools" program aimed at ensuring that elementary schools are providing students with DPA in addition to, and not in place of, the instruction of the Ontario HPE curriculum (Ontario Ministry of Education, 2005a).

Ontario's DPA framework seeks to make participation enjoyable while fostering competence in physical skills and aiding in social acceptance (Ontario Ministry of Education, 2006b). DPA enables elementary students in Ontario to improve and maintain physical fitness and improve overall health and wellness. DPA has also been shown to enhance student learning opportunities (Ontario Ministry of Education, 2006a).

In Ontario, the requirements for DPA are fairly strict compared with the western Canadian provinces, since it must take place during instructional time. In contrast to this restriction, Alberta and BC are able to count recess and unstructured play (before and after school) toward the DPA requirement. On the other hand, there are some similarities between the mandated DPA initiatives of BC, Alberta, and

Ontario. Common to both BC and Alberta, school principals are responsible for monitoring the programs that teachers implement, whereas in Ontario it is the teachers' responsibility to evaluate student physical activities and engagement with the DPA requirements (Ontario Ministry of Education, 2006a). DPA in Ontario schools must include a warm-up, sustained moderate-to-vigorous activity, and a cool-down period to follow. Students are encouraged to assess their own fitness progress; however, principals are responsible for keeping parents informed of student participation in activities and will thereby "make their best effort" to ensure DPA requirements are met (Ontario Ministry of Education, 2006b). Individual school boards throughout the province will monitor the overall implementation of DPA policy to ensure all students are provided with the "opportunity" to be active for a minimum of 20 minutes each day during instructional time (Ontario Ministry of Education, 2005c). Parents should be notified by their school board and/or principal about their children's participation and success in completing the DPA standards each school year.

***The Yukon.*** In response to the Canadian government's commitment to decrease the level of physical inactivity among Canadians by a minimum of 10% by 2003 (initiated in 1998), the Yukon Territorial Government and Recreation and Parks Association of the Yukon (RPAY) developed the Yukon Active Living Strategy in March 2000 (Recreation and Parks Association of the Yukon [RPAY], 2000). Although the Yukon does not have any mandated DPA requirements in elementary schools, there are independent initiatives such as RPAY, a nonprofit organization that works in partnership with Yukon groups, agencies, and individuals to promote and

support healthy, active lifestyles (RPAY, 2000). Since RPAY's original establishment in 1993, it has grown into volunteers and a small staff who are committed to empowering Yukon's people and communities to adopt healthy lifestyles.

RPAY's Yukon Active Living Strategy is divided into four categories: Active Yukon Communities, Active Yukon Lifestyles, Active Yukon Schools, and Active Yukon Workplaces. Within the Active Yukon Schools category, an online registered community of 24 schools in the province is committed to developing healthy and active schools. These schools take advantage of RPAY's 40-plus available online resources such as the Active-Healthy Kids Yukon Toolkit Program. This is a school-based initiative that furthers the integration of DPA and healthy living. It consists of a comprehensive training and resource opportunity to help all who work or care for children ages 0 to 5 years in order to provide daily, quality physical activity (RPAY, 2000). Although efforts such as these DPA frameworks are a good start to implementing daily DPA in the schools, DPA is not a mandated part of the curriculum such as in BC, Alberta, and Ontario.

***Saskatchewan.*** Although Saskatchewan does not have a provincially mandated DPA document similar to BC, Alberta, and Ontario, the province does have a DPA manual used as a resource for stakeholders in children's health, namely, schools, families, and the community (Saskatchewan in Motion, 2010). In 2010, Saskatchewan presented the province-wide movement In Motion, aimed at increasing physical activity for children and youth. The manual was designed in consultation with provincial education leaders in response to teachers looking for quality resources

for implementing classroom-based DPA, and to address the shared responsibility of stakeholders for children's health and well-being (Saskatchewan in Motion, 2010). The In Motion movement is a resource to help schools, communities, organizations, leaders, and individuals work together to ensure that children and youth are strong, active, and healthy (Saskatchewan in Motion, 2010). The goal of the In Motion DPA manual is to ensure that today's children and youth (K-8) participate in the minimum of 60 to 90 minutes of physical activity recommended each day by *Canada's Physical Activity Guide for Children and Youth* (Public Health Agency of Canada, 2009). Since attaining this recommendation is a shared responsibility between schools, families, and the community, each is advised to ensure that children and youth are participating in 30 minutes of physical activity each day (Saskatchewan in Motion, 2010).

Saskatchewan's In Motion DPA manual (2010) is intended to supplement the Saskatchewan Ministry of Education's (2010b) document, *Inspiring Movement: Play Well, Learn Well, Move Well*, which provides a physical activity framework and guidelines. The goal of the framework is to implement guidelines for physical activity in Saskatchewan schools while moving towards a Comprehensive School Community Health (CSCH) approach (Saskatchewan Ministry of Education, 2010a). Similar to the Yukon's RPAY strategy (2010), the *Inspiring Movement* framework is not yet mandated. This means that stakeholders are currently not held accountable for school-based DPA, although strategies such as this can be seen as the first step in developing future policy for physical activity in schools (Saskatchewan in Motion, 2010). In its current state, the In Motion manual (2010) recognizes the importance of

integrating 30 minutes of physical activity, over and above PE classes, into every school day (Saskatchewan in Motion, 2010).

***Other provinces.*** In Canada, the departments or ministries of education of the 13 Canadian jurisdictions—10 provinces and 3 territories—are responsible for the organization, delivery, and assessment of education at the elementary and secondary levels, for technical and vocational education, and for postsecondary education. Beyond provincially mandated PE programming, the remaining provincial jurisdictions, as of March 2012, have not mandated additional school-based physical activity programming for either elementary or secondary students in publicly funded schools. A detailed examination of the provincial curricula across Canada has thus revealed a lack of emphasis on school-based physical activity beyond already established PE practices.

**PE across the provinces.** At the elementary level, PE is positioned similarly across the provinces of Canada. All Canadian provinces have an elementary PE curriculum that mandates a minimum of 60 minutes spent in the subject area each week. The main differences found across the Canadian curriculum policy for PE are in the level of teacher training some provinces require specific to PE. For example, Quebec mandates that all PE teachers have specialist qualifications (Gouvernment du Quebec, 1984). The remaining provinces in Canada do not specify a requirement for specialist educators in PE. It is assumed that PE teachers at the elementary level do not have specialist training in PE. Another difference found in comparing elementary PE curricula across Canada is the recommended time allotments per week. As mentioned above, all consistently mandate a minimum of 60 minutes of PE a week,

although it is more common to expect approximately 150 minutes for Grades 1–7 (BC, Alberta, Saskatchewan, Ontario, Quebec, Nova Scotia).

Consistent across secondary PE curricula throughout Canada is a minimum one PE credit requirement for high school graduation. Although this requirement is consistent across the Canadian jurisdictions, at the secondary level the PE grade and credit requirements are positioned quite differently. For example, in BC and Yukon, PE is mandatory in Grades 9 and 10, whereas in Alberta, the Northwest Territories, Prince Edward Island, and Saskatchewan, it is required only in Grade 9. In Saskatchewan, however, there is a wellness component to the secondary curriculum, which mandates an integrated course of health education and PE. Students in Grades 10–12 are able to choose between three courses to meet this HPE requirement. Since only one credit is required, students may take the course in any grade between Grades 10 and 12. For Newfoundland and Labrador, there is a mandatory two-credit requirement for high school graduation. This requirement is unique, since it can be satisfied with two PE courses (55 hours each) or one healthy living course. On the other hand, Manitoba mandates four credits throughout Grades 9–12 (one per year), with each credit totaling 55 hours as with Newfoundland and Labrador. New Brunswick requires half the PE credits as Manitoba, for a total of two credits needing to be completed for graduation. In Quebec, the PE program is compulsory for all secondary pupils (Gouvernment du Quebec, 1984). This policy stipulates that each student must complete 100 minutes of PE each week during the school year, in each year of secondary school.

## Phase 2 Findings

There is a general belief that physical activity has positive effects on mood, and a great number of studies have even described an association between physical activity and anxiety (Strohle, 2009). This section of the project reports on findings from the growing instances of anxiety disorders in children and the possible relationship between childhood-onset anxiety and PA. According to Fox (1999), physical activity can be viewed from four different perspectives regarding its direct contribution to solving mental health problems: (a) prevention of mental illness and disorders, (b) treatment of mental illness and disorders, (c) improvement of the mental and physical well-being of those with mental illness, and (d) improvement of the mental well-being of the general population (Fox, 1999). As previously mentioned, a qualitative document analysis was the methodological approach of choice for this project, since it allowed me to research and report on studies pertaining to physical activity and student anxiety. Based on this approach, the reported findings in this section include how physical activity plays a role in all four mentioned perspectives regarding its relationship with anxiety.

**Physical activity and anxiety.** Although the benefits of including school-based physical activity programming such as the mandated DPA curricula include improving a child's physical and social well-being, for this project we will focus on reporting on the extent of the relationship between school-based physical activity and student anxiety.

Strong et al. (2005) conducted a meta-analysis examining the effects of regular physical activity on children and youth in America with anxiety. The goal of

the research was to develop a recommendation for the amount of physical activity deemed appropriate to yield beneficial health and behavioral outcomes. Such outcomes included domains of mental health such as student anxiety (Strong et al., 2005). Through the meta-analysis of over 850 studies, the authors found that most of the intervention studies reviewed used supervised programs of moderate-to-vigorous physical activity of 30-to-40 minutes duration 3-to-5 days per week. They also found that children should have greater exposure to physical activity; school-aged children and youth should participate in 60 minutes or more of moderate-to-vigorous physical activity that is developmentally appropriate and enjoyable and involves a variety of activities.

Also reported in the meta-analysis were cross-sectional studies, all of which suggested weak positive associations between physical activity and lower scores on scales of anxiety, whereas quasiexperimental studies showed strong positive influences of physical activity and improvement on measures of anxiety. It was found that the influence of physical activity on anxiety symptoms varied with the mode of activity (Strong et al., 2005).

There are high costs attributed to mental disorders and illness, and in the last 15 years there has been increasing research into the role of exercise in treating mental health and improving mental well-being. Numerous studies have now been conducted that explore the potential for exercise as a therapy for clinical or subclinical anxiety (undiagnosed), and the use of physical activity as a means of upgrading life quality through enhanced self-esteem, improved mood states, reduced anxiety, resilience to stress, and improved sleep (Fox, 1999). A study by Fox (1999)

found that exercise has a moderate reducing effect on anxiety; there was also evidence to demonstrate that exercise is effective in treating clinical depression and anxiety. Mental illness is socially debilitating and is associated with suicidal ideation and attempts, drug and alcohol abuse, and homelessness (Fox, 1999).

More recent recommendations from the Anxiety Disorder Association of BC (2012) have recommended that physical exercise be done daily to help relieve stress. It is said that physical activity triggers a physical "relaxation response." This response helps students slow down and eases tension in the muscles and minds. Anxious children often feel "tired all the time" because they are always exhausting themselves with worry, so they do not feel like being physically active. But exercise does in fact improve energy and reduce worry.

The Anxiety Disorder Association of BC (2012) has also offered a conflicting recommendation in the same document. Although the association recommends physical activity to reduce anxiety, it also suggests that a tool to help children relieve anxiety is relaxation. This seems to contradict the forms of treatment for anxiety that the association recommends, but it is important to remember that not all students who suffer from anxiety will be affected by the disorder in the same ways or will react to treatment options the same. If physical activity does not help a student with anxiety cope with his or her anxious feelings, the teacher can help the child to relax by using, as an example, mental imagery and progressive muscle relaxation (Anxiety Disorder Association of BC, 2012).

Although the above approaches are merely relaxation techniques that will work for some sufferers of anxiety, regular exercise may be more effective. The

Anxiety and Depression Association of America (2012) has suggested that a combination of physical activity and medication as a method to reduce symptoms of anxiety and depression has the potential to yield the most promising effects. For example, one vigorous exercise session can help alleviate symptoms for hours, and a regular schedule may significantly reduce anxious feelings over time (Anxiety and Depression Association of America, 2012). On the other hand, although exercise has a positive effect on most people, some recent studies have shown that for some, exercise may not positively affect anxiety or depression, or may not make a strong impact on long-term mental health (Anxiety and Depression Association of America, 2012). Nonetheless, other researchers have suggested that the beneficial effects of exercise on physical health are not in dispute, and people should be encouraged to stay physically active (Otto & Smits, 2011).

Further, psychologists studying how exercise relieves anxiety and depression have suggested that a 10-minute walk may be just as good as a 45-minute workout (Anxiety and Depression Association of America, 2012; Otto & Smits, 2011). Some studies have shown that exercise can work quickly to elevate depressed mood in many people. Although the effects may be temporary, they demonstrate that a quick walk or other simple activity can deliver several hours of relief. Researchers have found that those who participated in regular vigorous exercise were 25% less likely to develop depression or an anxiety disorder over the next 5 years (Anxiety and Depression Association of America, 2012; Otto & Smits, 2011). Although much of the evidence presented here has examined physical activity and anxiety in the general population, the findings derived and reported could hold true as well for student

populations, a large subset of the general population.

Recent evidence has also pointed to a potential relationship between physical activity and anxiety. Akandere and Tekin (2002) followed anxious students ($N$ = 311) who did not participate in regular physical activity. The study's aim was to explore the effects of physical activity on eliminating student anxiety. The students were given a standardized test for anxiety (Spielberger's State Trait Anxiety Inventory). The 60 students with the highest scores for anxiety were then evenly split randomly into a treatment group ($n$ = 30), who were exposed to regular physical activity, and a control group ($n$ = 30), who remained sedentary. Both groups were given pre-, mid-, and posttests, which revealed that female students experienced higher levels of anxiety, although the anxiety levels of both female and male students in fact decreased when daily physical activity was implemented. The results also determined that the type of physical activity played a crucial role in determining how much anxiety would decrease (Akandere & Tekin, 2002).

These results are congruent with those of Tyson, Wilson, Crone, Brailsford, and Laws (2010) from a similar study. This study investigated the association between physical activity and mental health, specifically anxiety and depression. Initially, students ($N$ = 100) were given two tests: one for anxiety and depression (Hospital Anxiety and Depression Scale), and the second for determining their levels of physical activity (Physical Activity Questionnaire). It was determined that those students with high levels of anxiety also had little-to-no exposure to physical activity, whereas students who reported low levels of anxiety had more regular physical activity (Tyson, Wilson, Crone, Brailsford, & Laws, 2010). Similarly, Martinsen

(2008) found that substantial mental health gains could be achieved when regular physical activity was implemented. Martinsen's findings were also consistent with those of Akandere and Tekin (2002), since Martinsen found that following physical activity, anxiety was significantly reduced. More specifically, anxiety levels remained significantly lower postexercise for 2–4 hours, which was then followed by a gradual increase in anxiety. Although after physical activity there was a marked decrease in anxiety, the effects appeared to be short-term (Martinsen, 2008).

Similar results were found in Zoeller's (2007) review of 18 studies that examined the relationship between physical activity and symptoms of anxiety and depression. Overall, Zoeller found that subjects who regularly participated in physical activity had a lower prevalence and incidence of anxiety and depression. As cited in Zoeller's work, Sexton, Maere, and Dahl (1989) compared 8 weeks of walking versus jogging as an intervention for anxiety and depression. Both groups demonstrated a marked reduction in symptoms of both anxiety and depression. Yet contrary to Martinsen's (2008) work, which reported on the positive effects of physical activity in reducing anxiety, those who were physically active did not show improvement in symptoms of anxiety. In fact, the joggers showed a greater improvement in fitness but not symptoms. But although there was no association between improvement in fitness and reduction in symptoms at the end of the 8-week program, there was an association between fitness and lower anxiety at a 6-month follow-up.

**Academic benefits of less anxiety and more physical activity.** Findings emerging from the qualitative document analysis also reveal that most of the studies

had recurring themes, such as highlighting the connection between academic achievement and student anxiety in relation to amounts of DPA. This section is dedicated to exploring further the connection between how student academics are enhanced when students exhibit low levels of anxiety and are exposed to consistent physical activity.

In a study by Caterino and Polak (1999), 54 children from Grades 2, 3, and 4 were exposed to one of two treatment groups: either 15 minutes of physical activity, or no physical activity. After the 15 minutes in which half the students stretched and participated in aerobic walking, all students were given a standardized test for concentration (Woodcock-Johnson Test of Concentration). The results showed that fourth graders performed better on the concentration test after physical activity exposure. But no differences associated with physical activity were found on test performance among second and third graders (Caterino & Polak, 1999).

Similar to Caterino and Polak's (1999) work on physical activity and levels of concentration, Sallis et al. (1999) found positive effects of physical activity on student academic achievement. When talking about the effects of regular physical activity, it is important to remember that PE is included as a school-based physical activity program; some of these programs differed in Sallis et al.'s study. The study explored the effects of a specialized 2-year school-based PE program on standardized academic achievement scores for children who completed Metropolitan Achievement Tests before and after finishing the program. Specifically, students ($N = 759$) in Grade 4 from seven different schools were followed until Grade 6. The students were either part of the control group, in which regular classroom teachers taught physical

activity in their usual way, or in one of two other groups that participated in an activity intervention program called SPARK. Two of the schools were assigned to having a certified PE specialist teach the activity program, whereas the remaining group had regular classroom teachers who were taught how to deliver the program. The researchers found that significant differences occurred among those students exposed to the SPARK program. Spending more time in PE did not have harmful effects on standardized achievement. In fact, similar to Caterino and Polak's findings, favorable effects were found on four of eight academic achievement measures. Those receiving PE experienced smaller declines in test scores over the 3 years compared with the controls. In only one of six subtests, controls had an advantage over those receiving PE (Sallis et al., 1999). These findings are in line with previously reported studies, which have highlighted the potential of physical activity (including all school-based PE programming) to decrease student anxiety and increase student test performance.

## Summary

This chapter has explored the extent of the relationship between school-based physical activity and student anxiety. In Phase 1, this chapter included a review of the current mandated school-based physical activity programming, beyond PE, that exists in elementary schools across Canada. Phase 2 of the chapter reported on findings from the growing instances of anxiety disorders in children and the possible relationship between childhood-onset anxiety and physical activity. This included highlighting recurring themes from the literature, such as how student anxiety and physical activity affect levels of student academic achievement. Chapter Five

summarizes the project through discussing key findings. The chapter then reports on the implications based on the reported key findings, and finally includes recommendations for stakeholders to improve upon current DPA practice.

# CHAPTER FIVE: SUMMARY, DISCUSSION, AND IMPLICATIONS

The focus of this master's research project has been twofold: to identify and describe current elementary curricular physical activity programs beyond school-based PE mandated by Canadian provinces and territories, and to explore the extent of the relationship between school-based physical activity and student anxiety. The purpose was to answer two research questions: First, to what extent is there a relationship between school-based DPA and elementary student anxiety, and second, beyond PE, what school-based curricular physical activity programming currently exists in Canadian elementary schools? With rates of mental illness higher than we have ever seen before, it is time we look to easily accessible preventive measures to eliminate some of the challenges that those affected will endure. Of particular concern is student anxiety, since this disorder is the most common mental illness seen in both children and adults. Anxiety disorders also more often than not go undiagnosed, leaving young people to potentially suffer. Not only does this affect a person's social and physical well-being, but it can also have detrimental effects on student academic success (Anxiety Disorder Association of America, 2012).

## Discussion

This section discusses the key findings of this project. It also explains how the findings relate to the field.

### Phase 1: Findings on Practice

The purpose of Phase 1 was to discuss how we arrived at answering our second research question, namely, beyond PE, what school-based curricular physical activity programming currently exists in elementary schools in Canada? This

research question was answered by examining provincial/territorial curricular policy relating to PE and physical activity. The examination revealed inconsistencies between the provinces and territories when it comes to providing mandated school-based physical activity beyond PE. The literature reviewed for this project, including government curricular documents and scholarly journals, showed that only three provinces, BC, Alberta, and Ontario, had mandated a DPA program beyond PE as part of elementary education programming. The remaining provinces and territories across Canada had yet to mandate their own iteration of the DPA programs offered in BC, Alberta, and Ontario. The variations between provincial school-based physical activity policies have created inconsistencies in school experiences for Canadian children, which have led to concerns over value differences and the creation of "have" and "have not" physical activity opportunities for children in Canadian schools.

In my document analysis, I also uncovered other provincial-wide initiatives that were either publicly or privately funded yet not mandated in schools. Since these efforts were not mandated, they were therefore merely recommendations or suggestions for stakeholders; although they were still of value and importance, they were not enforced or required. These included small-scale community initiatives that attempted to promote healthy lifestyles to the public regarding the importance of regular PA. Again, there were inconsistencies across the various initiatives as well. For example, the Yukon's Active Living Strategy, developed in March 2000 (RPAY, 2000), aimed to reduce inactivity by 10%. The goal of Saskatchewan's Health Promotion campaign, known as In Motion, was merely to encourage children and

youth to participate in 30 minutes of physical activity per day (Saskatchewan in Motion, 2010). Such inconsistencies could result from the fact that each province and territory is responsible for developing, providing, and assessing their own educational programming. It is also possible that the different provinces and territories have competing needs. But if this is the case, we would have to question why the health and physical activity recommendations are set at the national level.

Although the specifics of the goals for each campaign differed, there were some similarities between the two nonmandated health promotion campaigns in Yukon and Saskatchewan. For example, the levels of responsibility of stakeholders for children's health were consistent. The Yukon's Active Living Strategy (2000) and Saskatchewan's In Motion (2010) campaign believed that it is the responsibility of all teachers, parents, guardians, and others who work or live with children to promote more physically active lifestyles. This leads us to the link between policy and practice.

DPA and these school-based physical activity campaigns do indeed have direct implications for elementary teachers and students. For example, the more time the policy permits for physical activity, the more time elementary teachers need to manage and balance their instruction for other subject material. If teachers are not knowledgeable or comfortable with effective physical activities, they may feel insecure and may face repercussions by both the students and the principal or other stakeholders who uphold policy. Students in schools where DPA policy is implemented may also face the negative implications of such programming. For example, students whose interests lie beyond physical activity programming may feel

uncomfortable or marginalized if they cannot participate or perform in a physical activity the same way as their peers who are more inclined and interested in participating. Overall, we can see that although it is easy to critique why certain jurisdictions do not have a mandated school-based physical activity policy outside of regular PE classes, the many implications that such policies do have for teachers must not be ignored. Both teachers and students interact with the mandated policy in both positive and negative ways.

As an educator who happens to live and work in Ontario, one of the three provinces that have implemented a mandated DPA curriculum, I feel I am equipped with educated opinions on the relationship between mandated physical activity programs and teaching practice in Canada. I think that although provincial-wide initiatives are seemingly a good start to getting children more active, such programming is insufficient in achieving desired outcomes. There need to be more programs that are not only mandated but also upheld by stakeholders. Such programs need to target schools specifically as the site for instruction and implementation, since educators have no control over what happens in the home. It is not acceptable that only three of the 13 provinces and territories have mandated school-based physical activity programming. As the findings in this project suggest, children need to be provided regular and consistent opportunities for physical activity.

**Phase 2: Findings on Research**

The purpose of Phase 2 was to discuss how I arrived at answering the first research question, namely, to what extent is there a relationship between school-based DPA and elementary student anxiety? This question was answered through the

qualitative document analysis by presenting relevant findings from other researchers' work.

The findings from this analysis revealed that regular school-based physical activity has the potential to affect students' lives positively in many ways. For example, students who are physically active on a daily basis are better prepared for the school day, since they are more alert and better able to concentrate and perform their best academically (Ontario Ministry of Education, 2006a). Overall, student performance is enhanced when physical activity is implemented in children's lives consistently and regularly (Shephard, 1997).

Second, students are living more sedentary lives, while there is evidence that regular physical activity could prevent and treat student anxiety. I think these findings are important to people in the field of education or for those working with young populations because mental health issues often go unnoticed or are either misdiagnosed or undiagnosed. This is critical for educators to understand, since one in eight children will be affected by an anxiety disorder (Anxiety Disorder Association of America, 2012). If educators understand and value the implementation of regular and consistent physical activity, coupled with realizing the connection between physical activity and children's mental well-being, it is hoped that PA can be used as a tool to prevent and treat not only those children affected by mental illness, but for the otherwise healthy students in the class as well.

Through the exploration of the relationship between student physical activity and anxiety, it has become clear that many studies have looked at the relationship between physical activity and anxiety. This particular project is well aligned with the

research that (a) points to anxiety as a major issue that prevents children from living healthy, productive lives; and (b) looks at reasons why children are experiencing high instances of anxiety from the impact of their inactivity on their cognitive well-being.

The potential for physical activity to ease student anxiety has been demonstrated through a number of positive physiological effects, including releasing feel-good brain chemicals (neurotransmitters and endorphins), reducing immune system chemicals that can worsen anxiety, and increasing body temperature, which may have calming effects (Strohle, 2009). Along with this, physical activity may also help young people struggling with anxiety to gain confidence (American Heart Association, 2012). This may be achieved when one meets exercise goals or challenges, since even small ones can boost self-confidence. Similarly, getting in shape can also make students feel better about their appearance and take their mind off of worries. Physical activity acts as a distraction to get one's mind off the cycle of negative thoughts that worsen feelings of anxiousness.

Teachers providing adequate time for students to practice a skill or concept or just to move freely about can have a positive effect on students' overall mental, physical, and social well-being (Keays & Allison, 1995). Mandated school-based physical activity can challenge the innate desire of each child to explore, experiment, and be creative in any subject area. By providing students with a safe and supportive environment and adequate resources and facilities to participate in school-based physical activity, all students can be physically active participants and benefit from opportunities that enhance such things as self-confidence and problem-solving skills and, potentially most importantly, decrease the incidence of anxiety. It is essential

that students be provided opportunities to develop and maintain healthy lifestyles at an early age in hopes that these habits will continue into their adulthood, while instances of preventive disorders, such as anxiety, can be lessened.

## Implications

In accordance with the key findings presented in this project, I recommend that all provinces and territories of Canada implement and mandate DPA programming in their elementary schools. I recommend this because so much evidence points to the many benefits of living physically active lives, especially those having positive effects on children (WHO, 2011). For example, regular physical activity helps strengthen children's memory and problem-solving skills, helps them maintain a healthy weight, and decreases the likelihood of developing type 2 diabetes, heart disease, stroke, and hypertension (Ontario Ministry of Education, 2005b). In line with the research findings, I also recommend that fidelity and adherence to the documents and programming be enforced so that teachers, administrators, and stakeholders are held accountable for upholding such important school requirements. Although DPA has been mandated in some provinces, including BC and Alberta, and it has been implemented in Ontario elementary schools for 7 years, implementation and provision appears to remain uneven (Faucette & Patterson, 2001). Also problematic, as demonstrated by policy directives in Ontario, is that the Ministry of Education (2005) holds school boards accountable for monitoring the implementation of DPA, which makes the repercussions and responsibilities for teachers unclear. To me it would make more sense to have principals play a substantial role in ensuring that all teachers uphold the mandate, since they are able to observe what goes on in

the classroom more closely. Apart from the issue of vagueness in the mandated curricula regarding who is responsible for ensuring that teachers uphold the mandate and what the consequences are if they do not, other barriers also exist to implementing physical activity (Dwyer et al., 2003). Such potential barriers include, but are not limited to, time constraints, lack of teacher knowledge and skill specialization, space and safety issues, and insufficient resources (Faucette & Patterson, 2001). Not only is present research pointing to such barriers to implementation, but my own experiences and conversations with teachers and teacher candidates also bring truth to such allegations. In accordance with these findings, I would like to see more government responsibility in holding principals accountable for their teachers who are not implementing the required DPA mandates. Without accountability and without consequences for not upholding the DPA mandates, teachers are neither being rewarded for teaching to the DPA documents nor reprimanded for not doing so.

Since governments have issued policies for the way school-based physical activity programming should be implemented across large jurisdictions (provinces) without making special provisions for organizations or teachers, wide variations in the design and implementation of interventions have resulted (Ramanathan, Allison, Faulkner, & Dwyer, 2008). To make sure that all schoolchildren in Canada are receiving DPA at the provincially mandated level, we ought to be asking whether teachers are adequately prepared and equipped to offer it on a consistent basis. Evidence has suggested that teachers may feel ill-equipped to deliver such programming with confidence, and without the confidence to deliver effective DPA

instruction, teachers are getting away with not implementing DPA curricula (Barrett, 2011, in press). So why are elementary schools not upholding the mandated DPA documents issued by the different provincial ministries of education? Why are teachers resistant to implementing DPA when research says that physical activity each day is good and the right thing to do? Some examples of barriers we see to implementing new programs include low priority of PE in relation to other course subject material (De Corby et al., 2005) and time constraints: Some teachers believe there is simply more important material to be covered in a school day (Faucette & Patterson, 2001). Because of this, I recommend that researchers explore the relationship between teachers' beliefs about school-based physical activity in improving the health and wellness of students and their intent to teach or deliver these programs.

This brings us to the implications of the Phase 2 findings. The key findings from this phase showed that there is indeed a relationship between physical activity and anxiety. This has implications for both teachers and students. For example, teachers are thought to have the best interests of their students at heart, and if evidence suggests that many students suffer from anxiety and that all students, especially those suffering from anxiety, benefit from physical activity, teachers have a duty of care to provide adequate opportunities for such activity. There are also many implications for students. For example, it is possible that students, in particular girls, may exhibit more anxiety when physical activity is implemented. Physical activity can provoke anxiety in students who may not feel comfortable moving or being the center of attention in front of their peers. Because of this, I recommend that

future research look into potential ways around such barriers or the potentially negative aspects of implementing school-based physical activity. Future policies must protect children's rights to choose not to participate, but must also have fair and just repercussions or options for them to become active in other ways while at school.

## Conclusion

This master's research project has identified and described current mandated Canadian provincial and territorial programs for elementary curricular physical activity beyond school-based PE. Further, I have explored the extent of the relationship between school-based physical activity and student anxiety. With increasing mental illness related to anxiety that is going both diagnosed and undiagnosed, parents, administrators, and teachers are becoming increasingly aware of the need to consider the emotional state of our children and youth. As current research identifies a connection between childhood or adolescent anxiety and adult depression, the need for prevention and intervention at early stages of development becomes evident. Not only do schools partially contribute to student anxiety, but they also play a crucial role in preventing and intervening in cases of anxiety symptoms. Prevention and intervention lends itself to ensuring that a student's emotional development, as well as academic performance, will not be negatively affected.

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