Listening to parent stories about physical activity for children with ADHD

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most frequently encountered childhood developmental disorders that affects 8% to 10% of children worldwide (Biederman & Faraone, 2005; Brown et al., 2001). Fundamental movement skill (FMS) and physical activity (PA) participation challenges for children with ADHD remain largely misunderstood despite increasing numbers of research studies that have explored the phenomenon. Presently, there are few studies that have been conducted with parents of children with ADHD in the PA context. Hence, it was deemed timely and necessary to explore parental perceptions in relation to the PA experiences of children with ADHD. The current study explored retrospective and current perceptions of parents about the PA experiences of children with ADHD. The following central research questions guided this study: What do parents perceive about the PA experiences of their child with ADHD? How were the parents involved in their child's PA? Ten mothers and one father participated in individual interviews. A thematic analysis was conducted to interpret the interview data (Braun & Clarke, 2006). The "*Activity", "ADHD", "Play", "Family Experiences", and "Isolation"* themes emerged from the parent interviews. Three important findings emerged from this study. First, the findings showed all of the children were active in one way or another and both parents and children were making an effort to participate in PA. Second, the parents knew that their children experienced challenges when performing FMS. Third, the parents collaborated with their children to provide support and encouragement to become physically active. Thus, it is important for children and parents to choose PA together to become physically active, avoid social isolation and learn how to interact with other children. This current study is significant because it is one of the first to use retrospective and current parent perceptions.

Résumé

Le trouble déficitaire de l'attention (TDAH) est l'un des troubles de développement de l'enfance le plus fréquemment rencontrés qui atteint de 8% à 10% des enfants dans le monde (Biederman & Farone, 2005; Brown et al., 2001). Pour les enfants atteints de TDAH, leurs habiletés de mouvements fondamentaux et leur participation aux activités physiques (AP), restent largement mal compris malgré un nombre croissant d'études de recherches. Actuellement, il existe peu d'études sur les parents d'enfants atteints de TDAH et leur contexte d'AP. L'étude actuelle a exploré les perceptions rétrospectives et actuelles de l'AP des parents d'enfant atteint de TDAH. La problématique centrale reposait sur la question suivante : Qu'est-ce que les parents perçoivent au sujet des expériences de l'AP de leur enfant atteint de TDAH ? comment est-ce que les parents sont impliquées dans l'AP de leur enfant? Dix mères et un père ont participé à des entrevues individuelles. Les données ont été interpréter à partir d'une analyse thématique (Braun & Clarke, 2006). Cinq thèmes principaux sont ressortis : *« Activité », « TDAH », « Jouer », « Expériences Familiales », et « Isolation ».* Trois résultats importants sont ressortis de l'étude. Les résultats ont démontré que tous les enfants étaient actifs et, avec leurs parents, ils faisaient des efforts pour participer à l'AP. Deuxièmement, les parents étaient au courant que leurs enfants avaient de la difficulté avec leurs mouvements fondamentaux. Troisièmement, les parents collaboraient avec leur enfant pour leur supporter et les encourager à participer aux AP, à éviter l'isolement social et apprendre à interagir avec d'autres enfants. L'étude actuelle est significative car elle est l'une des premières à utiliser les perceptions parentales rétrospectives et actuelles.

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Contributions of Authors

August, 2017

To Whom It May Concern:

The purpose of this contribution letter is to confirm that the co-author (William J. Harvey) and the candidate (Vanessa G. Sayer) are in agreement that the manuscript entitled *Listening to parent stories about physical activity for children with ADHD* be placed in the candidates Masters thesis.

Candidate: Vanessa G. Sayer

Contributions: Conducted literature searches, performed qualitative analysis of the data, wrote the review of the literature and wrote the manuscript under the guidance of the co-author and made modifications to the document in response to his comments.

Co-author: William J. Harvey

Contributions: Involved in the conceptualization of the study, performed data collection, played the role of critical friend during research meeting, reviewed the analysis, and edited the manuscript.

I, the candidate, acknowledge the aforementioned roles and the co-author (William J. Harvey) contributions to the manuscript entitled *Listening to parent stories about physical activity for children with ADHD.*

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Vanessa G. Sayer

I, the co-author, agree that the candidate, Vanessa G. Sayer, include the manuscript entitled *Listening to parent stories about physical activity for children with ADHD* in her Masters thesis.

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William J. Harvey

Introduction

Emerging research suggests children with Attention Deficit Hyperactivity Disorder (ADHD) are at risk for challenges in PA and health (Harvey, Reid, Grizenko, Mbekou, Ter-Stepanian & Joober, 2007). Few studies have been conducted in the PA context for the parents of children with ADHD. Hence, it was deemed timely and necessary to explore parental perceptions in relation to the PA experiences of children with ADHD. This study is linked to two previous studies that interviewed children with ADHD about their PA experiences (e.g., Harvey et al., 2012, 2014). However, what is unique about the current study is that it focused on (a) current and retrospective parent views of the PA experiences of their children with ADHD and (b) how the parents were involved in their child's PA. The intention of this study was to gain a deeper understanding of parent perceptions about their children with ADHD and PA experiences.

There are two chapters in this Masters thesis. The first chapter, the literature review, includes a review of ADHD, child development, and their relation to PA. The development of PA and parental beliefs is presented. Chapter two contains a manuscript that describes the current study. This current study explored parent's stories about PA and their children with ADHD. The manuscript is divided into several sections to provide the reader with detailed information about the study. First an introduction on ADHD and PA is provided. Next the qualitative methods used for the study are presented. Third, a results section is provided and five themes are discussed with participant quotes. Next, a discussion is presented to draw the implications of the research. Finally, challenges and strengths of the study as well as opportunities for future research are included.

Chapter One

Review of the Literature

Disruptive behavior problems (DBP) in childhood are common, with significant wide-ranging effects on individuals, families and community (Fox, Snow & Holland, 2014). DBP are also associated with a wide range of etiological factors and comorbid disorders during childhood and adolescence (Costello et al., 2003; Lavigne et al., 2001) and disorders later on in adulthood (Kessler et al., 2005). Associated challenges may place unwanted stress on the child with DBP, family members and peers (Hill, 2002).

Attention-deficit hyperactivity disorder (ADHD) is a major DBP of childhood and it has been identified as one of the most frequently encountered developmental disorders in primary care (Brown, Freeman, Perrin, et al., 2001). The *Diagnostic and Statistical Manual of Mental Disorders-V* (American Psychological Association [APA], 2013) defined ADHD as characterized by developmentally inappropriate levels of hyperactivity, impulsivity and inattention. Children with ADHD may experience daily challenges in a variety of settings that include social, academic, and family functioning (Wehmeier, Schacht & Barkley, 2010).

Unfortunately, emerging research also suggests children with ADHD are at risk for challenges in PA and health (Harvey, Reid, Grizenko, Mbekou, Ter-Stepanian & Joober, 2007). The factors, responsible for these challenges, are not well understood (Harvey & Reid, 2003). However, Harvey and colleagues (2007, 2009) suggested the following 10 reasons for movement skill challenges: (1) a lack of physical skills and experience, (2) difficulties in relationship development and prosocial behaviors, (3) cognitive issues (e.g., inability to self regulate, inadequate problem solving skills, limited domain-specific and declarative knowledge), (4) comorbid disorders, (5) motivation, (6) time constraints, (7) stimulant medication. Harvey et al.

(2009) suggested three additional reasons for movement skill challenges: (8) an inability to understand and use observational learning models, and (9) learned helplessness. The final reason was the potential misperceptions of parents and teachers. Harvey and colleagues (2003) found research that suggested parents and teachers reported that children with ADHD had poor movement and sport skills (Doyle, Wallen, & Whitmont, 1995; Rasmussen & Gillberg, 1983; Stewart, Pitts, Craig, & Dieruf, 1966; Szatmari, Offord & Boyle, 1989). While it is important to note research studies have demonstrated that parents may play an important role in PA participation for typically developing children (Trost, Sallis, Pate, Freedson, Taylor & Dowda, 2003), there were few qualitative research data that described parental perceptions of PA influences for children with ADHD (Harvey et al., 2009). Hence, it was deemed timely and necessary to explore parental perceptions about the PA experiences of children with ADHD. Thus, this study's purpose was to explore parent perceptions of PA for children with ADHD.

This literature review discusses: (1) ADHD, (2) child development, parenting styles, and their interactions as well as (3) PA and parent influences for children with and without ADHD.

ADHD

Mental health problems, among youth and young adults, commonly affect between 20-25% of the U.S. population (Costello et al., 2003). Approximately 5% of American children will experience an emotional, behavioral or developmental disorder in any given year (Costello et al., 2003). Some of the most prevalent mental health problems consist of conduct and mood disorders (Blanchard, Gurka, & Blackman, 2006). In fact, childhood behavioral problems are one of the most common reasons for referral to child mental health services (Costello et al., 2003).

Neurodevelopmental disorders may begin during a child's developmental period (APA, 2013) and can manifest early before the child enters grade school. The disorders grouped within

the neurodevelopmental category are characterized by developmental deficits that may produce personal, social, academic, or occupational impairments in functioning (APA, 2013). They include ADHD, autism spectrum disorder (ASD), communication disorders, intellectual developmental disorder, motor disorders, and specific learning disorders. ADHD is one of the most common neurodevelopmental disorders of childhood and it has been a subject of great public attention and concern (APA, 2013). The topics covered in this section about ADHD include: (1) history, (2) prevalence, (3) etiology, (4) definition and symptomatology, (5) comorbidity and (6) treatment.

History. Sir Alexander Crichton provided the first example of a disorder that appeared to be similar to ADHD in 1798 (Lange et al., 2010). His characterization of the disorder was "the incapacity of attending with a necessary degree of constancy to any one object" (Lange et al., 2010, p.242). It is consistent with a modern description of inattention and the inability to attend to tasks or play (APA, 2013). Crichton (1789; as cited by Lange et al., 2010) also stated that the disorder generally diminished with age. This observation was similar to the commonly accepted notion of the 1990's where ADHD was a childhood disorder but children with ADHD grew out of the disorder during puberty (Kessler, Adler, Barkley et al., 2006; Okie, 2006). However, research studies demonstrated that approximately 50% of children with ADHD may retain symptoms of the disorder into adulthood (Arolt, 2008; Okie, 2006).

Another example of behaviors, similar to ADHD, may be found in 1844 when German physician Heinrich Hoffmann created children's stories that included ''Fidgety Phil' (Lange et al., 2010). Hoffmann depicted several explicit symptoms of modern ADHD throughout the story. For example, instead of following his father's request, Philipp "wriggled and giggled, and then, I declare, swung backward and forward and tilted his chair" (Burd & Kerbeshian, 1988, p. 262).

This description has been interpreted as symptoms of "motoric overactivity" (Burd & Kerbeshian, 1988, p 262). It is also similar to the DSM-V symptoms of ADHD: "often fidgets with hands or feet or squirms in seat" (APA, 2013, p. 60). Another example of the earliest references to ADHD is the Goulstonian Lectures of Sir George Frederic Still in 1902 that many authors considered to be the scientific starting point for the history of ADHD (Kessler et al., 2006; Conners 2000; Palmer & Finger, 2001; Rafalovich 2001). Many of Still's symptoms and descriptions did not refer to the 21st century ADHD definition. However, many of them appeared to indicate that children in the early 20th century showed symptoms of ADHD.

Thirty years later, the German physicians, Kramer and Pollnow, reported on a hyperkinetic disease that was characterized by symptoms of excessive motor activity (Kramer & Pollnow, 1932; as cited by Lange et al., 2010). These physicians observed recurrent outbursts of rage, increased excitability and a tendency to become aggressive or burst into tears with minimal provocation. These are similar characteristic behaviors of the impulsivity subtype in modern day ADHD (APA, 2013).

Charles Bradley discovered, in 1937, that children's behaviors were enhanced through the use of stimulants (Gross, 1995). The stimulant, Benzedrine, showed remarkable improvements in school performance for children with behavior difficulties, making Bradley's observations of stimulant effects in hyperactive children revolutionary (Gross, 1995). While Benzedrine was the first stimulant used to treat hyperactivity, it is no longer being used and has been replaced by methylphenidate or other stimulant medications. Stimulant medication is believed to increase dopamine levels in the brain. Dopamine is a neurotransmitter linked to motivation, attention, and movement. Thus, stimulant medication is able to increase concentration and focus for some individuals with ADHD. It has also been shown to reduce

hyperactivity and impulsive behaviors (Isaksson, Hogmark, Nilsson & Lindbald, 2013).

Prevalence. ADHD affects 8%-10% of children worldwide (Biederman & Faraone, 2005) Prevalence rates have ranged between 2.9%-5% in Canada (Brault & Lacourse, 2012; Charach, Lin, & To, 2010) while 5.4% of children between 6 – 14 years were diagnosed with ADHD in Quebec (Breton, Bergeron, Valla et al., 1999). The range of prevalence estimates are likely due to differences in sampling, diagnostic threshold, data collection methods and time frame (Scahill, Schwab-Stone, Merikangas et al., 1999). ADHD is most commonly observed in boys, with a male-to-female ratio of 6:1 in clinical samples and 3:1 in epidemiological samples (Gingerich, Turnock, Litfin, & Rosen, 1998). Also, boys with ADHD are usually identified more often with the hyperactive/impulsive subtype when compared to girls who are more likely to demonstrate an inattentive subtype (APA, 2013; Gaub & Carlson, 1997). Girls may be less likely to exhibit disruptive behavior and have been shown to be more emotionally distressed with higher rates of depression and anxiety than their male counterparts (Greene, Biederman, Faraone, et al., 2001). ADHD is considered to be a multifactorial disorder with a complex etiology, thus the definition has evolved over the years and through research continues to change.

Definition and Symptomatology. The contemporary concept of ADHD, as defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM) is continuously changing. ADHD is defined in the DSM-V of the American Psychiatric Association (APA, 2013) with five specified diagnostic criteria: (a) 6 to 12 behavioral symptoms must be identified; (b) several symptoms must be evident prior to the age of 12; (c) symptoms are present in two or more settings (e.g. at home, school, or work); (d) symptoms interfere with, or reduce the quality of, social, academic or occupational functioning; and (e) symptoms should not be better explained by another disorder (APA, 2013).

The main feature of ADHD is a persistent pattern of inattention and/or hyperactivity-impulsivity symptoms that may interfere with everyday functioning and development (APA, 2013). Inattention in ADHD may manifest as wandering off-task behaviors, lacking persistence, or having difficulty sustaining focus. Thus, this inattention is not due to defiance or lack of comprehension. Hyperactivity refers to excessive motor activity (APA, 2013), for example, a child running about excessively. Impulsivity refers to thoughtless actions that occur in the moment that could have high potential of harming the individual (APA, 2013). It can also be manifested as social intrusiveness as well as making important decisions without consideration of long-term outcomes. An emphasis has also been placed on deficits in attention (Douglas, 1999) and a lack of self-control and self-regulation to define ADHD (Barkley, 1997; 1998). For example, Barkley (1997) suggested children with ADHD have difficulties in self-regulation and an inability to proceduralize their declarative knowledge. In other words, "ADHD is more a problem of doing what one knows rather than of knowing what to do" (Barkley, 1997, p. 335).

ADHD usually begins in childhood. Children must exhibit at least 6 symptoms of either the inattention criteria or the hyperactivity and impulsivity criteria, or both, in order to be diagnosed into one of the three presentation subtypes (APA, 2013). The ADHD-I subtype describes maladaptive levels of inattention. Children with this subtype are easily distracted and unable to pay attention for long periods of time. The ADHD-H subtype describes maladaptive levels of hyperactivity-impulsivity. Children with this subtype of ADHD appear to be constantly active and/or impulsive. Finally, the ADHD-C subtype describes individuals who exhibit significant symptoms of both inattention and hyperactivity-impulsivity (APA, 2013). Furthermore, the symptoms of the disorder must be present in more than one setting (e.g., home, school, work). Parents, teachers, and doctors must observe substantial symptoms across settings.

It is challenging to diagnose ADHD during a child's early years as the primary symptoms of hyperactivity, inattentiveness and impulsivity may be more commonly observed in young children. Moreover, in the diagnostic process, the symptoms must be judged as disruptive and inappropriate for child's developmental level (APA, 2013). There is a challenge to diagnose children at a young age because multiple factors must be considered that take into account the intensity, frequency, and age of onset of the symptoms (APA, 2013). Differentiation of the symptoms of ADHD with typically-developing child temperament styles is also challenging and not viable before the age of three years as the nervous system of young children may have not matured yet (APA, 2013). These factors (e.g., the intensity, frequency, age of onset of the symptoms, temperament) should be taken into consideration to not overrate the natural eagerness and enthusiasm of young children. The APA diagnostic requirements for ADHD are that several symptoms must be apparent before the age of 12 years (APA, 2013). ADHD is most often identified throughout elementary school years when inattention becomes more prominent and impairing to the child (APA, 2013). The symptoms that characterize ADHD challenge children, especially in school because their actions translate into inappropriate behaviors like difficulties taking turns, interrupting others, and excessive motor activity (Barnard-Brak et al., 2011).

ADHD symptoms can also affect several aspects of a child's life (APA, 2013) that may include difficulties in cognitive, developmental, behavioral, emotional and academic areas (Barkley, 1998). Children with ADHD, whether or not a specific learning disorder is diagnosed, may experience impairments in academic performance (APA, 2013). They may not perform well on tests of executive functioning or memory, however, the sole use of these test scores may not lead to an accurate diagnosis of ADHD (APA, 2013). Children with ADHD may further be at a higher risk of having difficulties with low self-esteem and poor social behaviors, both at home

and at school, as well as difficulties in maintaining peer relationships (Litner, 2003). For example, Mrug, Molina, Hoza et al. (2012) explored the peer status of 579 clinically-diagnosed children with ADHD, 7–9 years, from the Multimodal Treatment Study of Children with ADHD (MTA, 1999). They found 52% of children with ADHD fell in the rejected category and less than 1% of the study participants were of popular status. Pelham and Bender (1982) conducted a study that involved placing children with ADHD in groups with unfamiliar non-ADHD peers in play-groups. The non-ADHD participants complained about the behavior of their ADHD counterparts within minutes. Hoza (2007) believed this type of result might be due to the lack of ability in shifting social roles. For example, Hoza (2007) asked children with ADHD to take part in shifting from one role to another. The results suggested their ability to do so was lacking, suggesting the need for a greater emphasis on accurate self-evaluation, self-monitoring, and learning appropriate responses to social cues. Hence, children with ADHD may lack the skills necessary to effectively function in ongoing and constantly changing social interactions.

Comorbidity. Another factor that may affect children with ADHD are high rates of coexisting psychiatric disorders. Comorbidity refers to the presence of one or more disorders co-occurring with a primary disorder (APA, 2013). For example, epidemiologic studies documented high rates of psychiatric comorbidity among children with psychiatric disorders (McConaughy & Achenbach, 1994). A finding, consistent with the adult epidemiologic literature, that suggested comorbidity was the rule and not the exception for psychiatric disorders (McConaughy & Achenbach, 1994). Wilens, Biederman and Spencer (2002) found, among groups of pre-school and school-aged children with ADHD, 75% and 80% of the groups, respectively, had at least one other disorder. The most common comorbid disorders include oppositional defiant disorder (ODD), conduct disorder (CD), mood disorders (e.g., bipolar depression), anxiety disorders and

learning disorders (Wolraich et al., 2005). Barkley (1998) suggested that approximately 30% of children with ADHD also have a learning disorder and 50% experience academic difficulties.

Comorbid disorders are frequently diagnosed in individuals with ADHD in clinical settings. For instance, Barkley (2007) suggested 80% of children with ADHD in clinical settings fulfill criteria for at least one other DSM-IV diagnosis and approximately 50% for at least two other diagnoses (Barkley, 2007). For example, 54% - 84% of children and adolescents with ADHD may meet the criteria for ODD and/or CD (Barkley, 2006). About 25% to 35% of children with ADHD may also encounter coexisting various learning and language disorders (Pliszka 1998; Wolraich et al., 2005), such as reading, writing, arithmetic, language and coordination disorders. Pliszka (1998) also showed that children with ADHD may be at risk of movement skill difficulties. Thus another comorbid disorder in ADHD is developmental coordination disorder (DCD). Furthermore, anxiety disorders may occur in up to 1/3 of children with ADHD (Biederman et al., 1991; MTA Cooperative Group, 1999). Children with ADHD may also develop secondary depression in reaction to continuing frustration over their failure to learn which may lead to low self-esteem (Wolraich et al., 2005).

Treatment. ADHD can be a life-long condition and a flexible care plan is needed to provide support and patient education. Individual differences in diagnoses may result in different treatments. For example, individual treatment may differ and should be flexible due to different milestones, patient defined goals and self-management skills (Turgay et al., 2012). Children with ADHD and their parents/guardians are usually served by a treatment team to create an intervention plan and multimodal programs (e.g. medication, behavioral, social skills interventions, etc.).

Psychostimulants are the pharmacological treatment of choice for ADHD, with adjunct treatments that include behavioral, educational, and other therapeutic interventions for both parents and child (Hantson et al., 2012). Research has shown that the use of medication improved key symptoms of ADHD and children-parent relationships (Hantson et al., 2012). The literature on stimulant treatment for children with ADHD suggested the medication(s) are efficacious, but may not normalize functioning (Evans et al., 2005). Medication is not always the most favorable option due to difficulties related to sustained adherence, resistance by some parents and children, and the presence of a significant number of nonresponders. Since medication may not normalize behaviour, resources can be allocated to develop and evaluate psychosocial interventions for children with ADHD (Evans et al., 2005).

Many non-pharmacological interventions have been beneficial for children with ADHD (McGoey, Eckert, DuPaul, 2002). For example, the combination of medication and behavior management approaches led to stronger improvement in academic, cognitive and behavioral outcomes compared to medication alone (Evans, Owens, & Bunford, 2014). Next, Taylor et al. (2004) suggested the first line treatment in mild to moderate cases of children and adolescents with ADHD was parent training/education programmes for caregivers and psychological and/or social skills training for children. Evidence shows that children with ADHD respond positively to interventions with some type of adherence. Yet, few research studies have shown that children are able to implement the skills they learned throughout the intervention. Grizenko, Archambault, and Pawliuk (1992) reported that peer relations and self-esteem were more of a challenge for children with behavior disorders. However, they found that an efficient approach to treat these difficulties was through the use of an intensive multimodal day treatment program., Girls and boys with behavior difficulties showed improved social behaviors after treatment. The

day treatment program improved self-esteem and the quality of peer relations. They also found that medication alone was not sufficient to improve peer relations.

A second non-pharmacological intervention is physical activity (PA). PA has shown to be beneficial to manage ADHD symptoms along with medication (Hoza, Martin, Pirog & Shoulberg, 2016). Both short- and long-term studies support the clinical benefits of PA for children with ADHD (Ng, Ho, Chan, Yong & Yeo, 2017). Similar to stimulant medication used to treat ADHD, PA appears to exert a physiological effect that increases hormones such as dopamine and norepinephrine, which may help alleviate the symptoms of ADHD (Ng et al., 2017). PA has shown to be beneficial, compared to stimulant medications that may have significant side effects (Reeves & Bailey, 2016). A recent review study suggested a positive and significant association between increased PA and fewer ADHD symptoms (Song, Lauseng, Lee, Nordstrom & Katch, 2016). PA may enhance both cognitive and behavioral outcomes (Reeves & Bailey, 2016). For example, a recent literature review reported a significant negative correlation between enhanced PA participation and behavioral symptoms of ADHD (Reeves & Bailey, 2016). Hence, the challenge of understanding and treating ADHD is multifactorial. Thus it is important to understand which method of treatment works well for the child.

Parenting

The early years of a child's life are important for individual health and development. The Centre for Disease Control (CDC, 2017) suggested that it is a guardian's responsibility to help each individual child to grow up in an environment where social, emotional and educational needs are met. This review of literature now focuses on parenting in order to provide a global background for the current study. The topics covered in this section include: (1) parenting style, (2) parenting style and child behaviors, and (3) parenting style and ADHD.

Parenting style. Parenthood is an important and demanding task in adult life (Laukkanen, Ojansuu, Tolvanen, Alatupa, & Aunola, 2014). Parenting style has been defined by parents' behaviors and characteristics. It tends to depend on the amount of warmth that parents show their children and the number and type of demands they set for their off-spring (Darling & Steinberg, 1993). The concept of parenting style is prominent in many research areas but especially in child development and socialization processes (Baumrind, 1971). The process of socialization refers to how a child acquires skills, motives, attitudes and behaviors that are required to successfully adapt to a family or culture (Baumrind, 1971).

Schaefer (1965) was one of the first to organize and classify parental behaviors. Schaefer addressed the ideas of strict and lax behavior control, psychological control and autonomy. Baumrind's research (1971) built on Schaefer's ideas and furthered parenting behaviors by conceptualizing them as authoritative, authoritarian, and permissive parenting styles. Each style represented different dimensions of parenting. Baumrind identified four important dimensions of parenting through the use of naturalistic observation and parental interviews: (1) disciplinary strategies, (2) warmth and nurturance, (3) communication styles, (4) expectations of maturity and control. Each of these dimensions may be apparent in parents in varying degrees.

An authoritative parenting style is characterized with high scores in the four parenting dimensions. The authoritative parent creates structure and sets expectations for the child but does so in a warm, open, supportive environment. He/she shares reasons behind decisions. The parent understands the child's present qualities but also sets standards for the future. (Baumrind, 1971).

The authoritarian parenting style is characterized with low scores in each of the four parenting dimensions. An authoritarian parent expects adherence to rules and responsibilities and for children to do so without question. A parent, who has an authoritarian style, values obedience

and does not encourage flexibility (e.g., give and take) compared to an authoritative parent. He/she believes the child should accept the parents' decisions as right and does not value warmth and responsiveness (Baumrind, 1971; Nelson, Nelson, Hart, Yang, & Jin, 2006).

The permissive parent is characterized by high scores in warmth and nurturance but low scores in disciplinary strategies, communication, and expectations of maturity and control. Baumrind (1971) found that a permissive parent does not value punishment or authority which is associated with little to no implementation of child responsibility and little concern for age-appropriate behavior. He/she sets few expectations and assigns few responsibilities to the child. A permissive parent allows the child to regulate his/her own activities and does not use control nor encourages the child to obey eternally defined standards (Baumrind, 1971).

Maccoby and Martin (1983; as cited by Baumrind, 1991) then added to Baumrind's original ideas by developing a contingency table featuring responsiveness and demandingness. Responsiveness is the degree to which a parent supports and attends to their child's needs. Demandingness is the expectation that the child will act in a mature and responsible way. The proportion of responsiveness and demandingness is important to determine a parenting style. Parents are either rated high or low on each set of dimensions. For example, the uninvolved parenting style is characterized by low scores in all dimensions. This parenting style demonstrates the ability to take care of the child's basic needs. However, it shows a detachment from the child's life. In extreme cases, the parent may even reject or neglect the basic needs of their children. Thus it is important to have an equal proportion of responsiveness and demandingness for the wellbeing of the parent-child dyad.

The parent–child dyad within the family is the most immediate micro-system of socialization. It strongly relates to important outcomes such as the development of attachment,

self-regulation, prosocial behavior, competence, and achievement motivation (Berns, 2007; as cited by Takeuchi & Takeuchi, 2008). A vast amount of research has been conducted on the effects of authoritarian and authoritative parenting styles. An authoritarian parenting style has been shown to lead to a competitive environment in which parents discourage spontaneity and support within the parent-child relationship (Takeuchi & Takeuchi, 2008). In contrast, the authoritative parenting style was found to lead to a cooperative environment where parents encourage spontaneity and support.

Research has also explored the differences between mothers and fathers with regard to authoritative, authoritarian and permissive parenting styles. For example, Simmons and Conger (2007) highlighted the paucity of research regarding the effects of different parenting styles on family functioning. Researchers examined 16 possible parenting style combinations in a sample of 451 families (i.e. mother - authoritative parent and father - authoritarian parent; mother - authoritative parent and father - permissive parent, etc.) Results indicated that the most common form of family parenting style was authoritative and it was found to be associated with the best results, showing lower levels of depression and delinquency (Simmons & Conger, 2007).

Parenting Styles and Child Behaviors. An authoritarian parenting style was found to be positively related to negative child behavioral outcomes in family research. For example, children of authoritarian parents are more likely to engage in negative behaviors compared to elementary-aged children of authoritative parents (Caron, Weiss, Harris & Catron, 2006; Gadeyne, Ghesquiere, & Onghena, 2004). Research has also shown children develop higher aggression and behavior disorders if they were brought up in an authoritarian household (Hollenstein, Granic, Stoomiller & Snyder, 2004). However, authoritative parenting styles have

been found to predict improved child well-being in the domains of social and cognitive competence, academic performance, psychosocial development, and problem behavior (McGillicuddy-De Lisi & De Lisi, 2007). For example, children of authoritative parents were able to adapt more quickly to the routine of going to school than children nurtured through other parenting style combinations (McGillicuddy-De Lisi & De Lisi, 2007). Authoritative parents also listen to the child's comments and jointly make decisions by using reasoning techniques. For example, Chen, Dong and Zhou (1997) found that the authoritative parenting style was positively associated with maximal levels of social adjustment and negatively associated with adjustment problems in second-grade school children.

Children of authoritative parents possess the following characteristics. They earn higher grades in school; are more achievement oriented, independent, self-reliant, friendly, and cooperative; are less depressed, anxious, and dependent; and show lower levels of internalizing and externalizing behavior problems (McGillicuddy-De Lisi & De Lisi, 2007). Furthermore, the relationship between authoritative parenting and positive cognitive and social development in children appears across social classes and ethnic groups. Thus, the research shows positive effects of authoritative childrearing styles over the alternative types of styles.

Although much family research focused on authoritarian and authoritative styles, there are a few studies that addressed permissive parenting. Baumrind (1968) was the first to discuss the qualities of a permissive style parenting. For example, Baumrind explained that aggression increased in preschoolers when parents did not demonstrate authority. Casas et al. (2006) found that mothers, with a permissive parenting style, had daughters who demonstrated the highest levels of relational aggressive behaviors. Jewell et al. (2008) found that authoritarian mothers and permissive fathers reared children with the most reported disruptive externalizing behaviors

in the classroom and at home. This research supports the idea of coparenting in the same style and communication between parents. However, this is not easy as there are numerous factors that influence and affect parenting.

Positive outcomes have been consistently demonstrated when both mother and father used the same parenting style (Rinaldi & Howe, 2012). Consistency in parenting is seen as an important element of family harmony and it is deemed an essential part of positive child outcomes (Caldera & Lindsey, 2006). Parental consistency can also be understood by the term coparenting. The coparenting relationship is characterized as a family group dynamic that involves the mother, father, and child. It is different from other dyadic relationships within the family. The definition of coparenting is the collaboration of two persons, the child's mother and father, who coordinate their parenting, support each other, and manage conflict in regards to child rearing (McHale, Kuersten-Hogan, Lauretti, & Rasmussen, 2000). A supportive coparenting relationship may contribute to parents' well-being as they are able to assist one another. It has the potential to enhance family efficacy and child outcomes (Feinberg & Kan, 2008). However, the coparenting relationship can also depend on the child's temperament (Solmeyer & Feinberg, 2011). There is little research on positive infant temperament and its links with parent-child outcomes (Solmeyer & Feinberg, 2011). However, Solmeyer and Feinberg suggested parents, whose children were more positive in temperament, reported feeling more efficacious about their abilities to respond to their child's needs. Thus, the dyad of children with positive temperament and parents who feel confident about their abilities may positively increase their interactions over time. A strong sense of efficacy could lead to more sensitive and competent parenting. Finally, more competent and efficacious coparenting may lead to more positive child outcomes, such as effective social skills and school successes.

Parenting styles and ADHD. Children with ADHD may be generally non-compliant and difficult to manage. In fact, research demonstrated that having a child, who is non-compliant and difficult to manage, often results in maladaptive parenting practices (Kessler et al., 2006; Modesto-Lowe, Danforth & Brooks, 2008). Researchers suggested children with ADHD posed an elevated rate of parental stress (Johnston & Mash, 2001) compared to their counterparts (Dos Reis & Myers, 2008). Thus, increases in parental stress may affect the parent–child relationship and have a negative impact on parenting styles (Theule, Wiener, Rogers & Marton, 2011).

Inconsistent family coping strategies may lead to the use of less constructive discipline practices (McKee, Harvey, Danforth, Ulaszek & Friedman, 2004). Therefore, the manner in which a family manages their child's ADHD may influence the course and severity of the disorder (Johnston & Mash, 2001). For example, this mismanagement may then contribute to more disruptive and less compliant behaviors by the child (DuPaul, McGoey, Eckert & VanBrakle, 2001). A recent study on parenting styles and ADHD found that mothers of children with ADHD scored significantly higher on negative parenting style variables such as strictness, interference and inconsistency when compared to a control group of mothers whose children did not have ADHD (Mano & Uno, 2007). The authors suggested the strict and reproachful parenting style was likely due to a lack of attachment to the child. While there have been valuable gains in research on family functioning in relation to ADHD, a comprehensive understanding of the interaction of children and family characteristics remains difficult because of the complexity of parent–child relationships. To reduce the sometimes high stress environment of families with children with ADHD, PA can be used as an outlet. PA has many health benefits and can be employed to help children as well as adults to decompress and reduce stress (Barnes, Colley & Tremblay, 2012).

PA

The topics covered in this section will include: (1) PA, (2) PA and children with disabilities, (3) PA and ADHD, (4) PA and parental beliefs, (5) Parental PA beliefs and ADHD.

PA and physical education (PE) are two terms that hold several differences and should not be used interchangeably. Therefore, it is important to define them for the purpose of this study. PE helps students develop motor efficiency and psychosocial skills (Kohl & Cook, 2013). It helps acquire the knowledge, attitudes and behaviors that children need to manage their health and well being. It takes place in school and is usually part of a curriculum. PE teaches children how to become physically active and can also increase individual PA levels. PA is usually defined as any movement of the body (Kohl & Cook, 2013). PA for children may be considered as anything from recess, playing outside during after school hours, or extra-curricular activities on evenings and weekends. Youth receive numerous physical health benefits from PA that may include improved physical fitness, cardiovascular function, metabolic function, and bone health (Kohl & Cook, 2013). The Canadian Physical Activity Guidelines, released by the Canadian Society for Exercise Physiology, for all healthy children (5-11 years) and youth (12-17 years) recommended at least 60 minutes of daily moderate-to-vigorous PA (MVPA; Tremblay et al., 2011). However, Canadian Health Measures Survey (CHMS, 2007) accelerometer data revealed that, on average, only 7% of Canadian children and youth were meeting these guidelines.

There are three areas in which children have the potential to become more active: (1) during school, (2) after-school hours, and (3) evenings and weekends. First, schools provide a unique setting for youth to participate in both PA and PE. Several school-based interventions have successfully increased PA (Kriemler et al., 2010). There is a growing body of research focused on the association between school-based PA and academic performance among school-

aged youth (Trudeau & Shephard, 2008; Tomporowski et al., 2008). For example, in a meta-analysis, Rasberry et al. (2011) found 11 of 14 studies reported one or more positive links between PE and cognitive skills and attitudes, academic behavior and academic achievement. The studies also suggested that increased time spent being physically active did not undermine academic performance even when there was less time devoted to subjects other than PE (Rasberry et al., 2011). Hence, regular PA has been linked to a range of physical and mental health benefits (Barnes et al., 2012; Woods, Mutrie, & Scott, 2002). It is a key component to children's health, fitness and wellbeing and it also promoted social contact and friendship (Shields, Synnot, Barr, 2012). Furthermore, research has displayed a non-specific dose-response relationship that demonstrated increases in PA to be associated with improved health outcomes (Janssen & LeBlanc, 2010; Barnes et al., 2012).

Schools are an ideal setting for promoting PA in children for a number of reasons. Naylor and McKay (2009) suggested two reasons: (1) The significant number of hours spent in school each day may create an extended window of opportunity to promote PA and (2) The supportive teacher-student relationship may be able to promote PA and healthy habits as well as be involved in organizing PA events. While less than one in five Canadian schools (approximately 16%) are providing daily PE (Cameron et al., 2003), research has also shown that another suitable window of opportunity for children and youth to engage in PA is during the after-school period (e.g., 3pm-6pm; Trost, Rosenkranz & Dzewaltowski, 2008). Canadians have achieved only 14 minutes out of 180 minutes that may be available for MVPA during the after-school period (8%; Active Healthy Kids Canada, 2011). In contrast, Active Healthy Kids Canada (2011) suggested that 107 minutes of after-school time (e.g. 92% of the 180 minute after-school period) were being spent in either light activity (e.g., walking less than 3.2 km/h, light play) or sedentary recreation (e.g.,

motorized transportation, sitting, reclining, standing). The rise of screen-based sedentary behaviors (e.g., hours in front of a TV or internet/computer use) contributed to inactive lifestyles in Canadians, which makes physical inactivity a major health concern for Canada (Sari, 2009). After-school programs have the potential to promote PA through structured and unstructured activities (Trost, Rosenkranz & Dzewaltowski, 2008). Trost and colleagues (2008) found that students accumulated significant amounts of MVPA while attending after-school programs. Another potential time for children and youth to take part in PA is on evenings and weekends. Parents play a significant role in this area as they can serve as gate keepers to PA (Beets, Cardinal & Alderman, 2010). They are primary providers for their children and are able to promote and directly facilitate PA during childhood (e.g., 5-12 years). Parents can provide tangible support to their children through transportation to places where they can engage in a variety of PA such as sports, team practices, play with friends or even play at local community parks and recreation facilities (Davison, Cutting & Birch, 2003). This type of tangible support may also include the direct involvement of parents and children by playing together and using family time to be active (Beets et al., 2010).

PA and Children with Disabilities. Children with disabilities, in general, have a greater possibility of being physical inactive and experiencing health risks associated with a sedentary lifestyle compared to typically developing children (Pitetti, Rimmer & Fernhal, 1993). For example, children and youth with physical or developmental disabilities participated less in PA than children without disabilities (Esposito, MacDonald, Hornyak, & Ulrich, 2012; Pitetti et al., 1993; Shields, Synnot, Barr, 2012). The Canadian National Longitudinal Study of Children and Youth also found that the prevalence of children, between 6-11 years, with a chronic health condition was 30.3%, with 3.6% of the sample who had limited daily PA due to their

impairments (McDougall et al. 2003). The prevalence of childhood disability and limitations to participation in daily activities was reported to be 4.2% in a Canadian survey of disability, (Statistics Canada, 2002). Some of the reasons for the limited amount of daily PA include social, cultural, and environmental factors (Shields, Synnot, Barr, 2012).

PA participation is the context in which individuals may form friendships, develop skills and competencies, express creativity, achieve mental and physical health, and determine meaning and purpose in life (Law et al., 2006). Thus, PA participation is important because it may have a positive impact on individual development, quality of life and positive long-term outcomes for children with developmental disabilities (Anderson, Bedini & Moreland, 2005). For example, children with cerebral palsy are significantly weaker than age-matched peers and participation in strength and weight-bearing programs were recommended to slow the disorder's progression and improve overall functioning (Rimmer, 2001). The participation in day-to-day formal or informal PA is vital for children because it helps develop skills and competencies, social relationships and improve long-term health (Forsyth & Jarvis 2002). Properly designed and implemented PA programs for children with disabilities should target cardiovascular endurance, flexibility, balance, agility, and muscular strength and accessibility, safety, and enjoyment (Murphy & Carbone, 2008). Overall, sports participation for children with disabilities should be tailored to individual needs and may take a period of time to implement with input from physicians, coaches, PE teachers, physical and occupational therapists (Murphy & Carbone, 2008). Therefore, rather than exclusion from participation in PA, the goal is inclusion for all children with disabilities in PA. It is important that children are empowered to participate in PA (Murphy & Carbone, 2008).

PA and ADHD. There is a growing body of research about PA and children with ADHD that has been centered around (a) movement skill performance and (b) the effects of PA interventions. First, contrary to the belief that children with ADHD are always active and therefore, must be good movers (Anderson & Rumsey, 2002), studies show that children with ADHD have poor movement skills (Brossard-Racine, Shevell, Snider, Belanger & Majnemer, 2012). For example, children with ADHD tend to be excessively active and engage in motor activity, however, they have difficulties when performing locomotor and object control skills (Harvey & Reid, 2003). Hence, they are at risk for developmental delays in movement skill performance when compared to children without ADHD (Harvey et al., 2007; Verret, Gardiner, & Beliveau, 2010; Verret, Guay, Berthiaume, Gardiner & Beliveau, 2012, Smith et al., 2013). For example, Harvey et al. (2007) compared fundamental movement skills (FMS) of 22 children with ADHD to 22 peers without ADHD and found that children with ADHD scored significantly lower on the locomotor skills and object control skills sub-tests of the Test of Gross Motor Development-2 (TGMD-2; Ulrich, 2000). The study concluded that children with ADHD may be at risk for developmental delays in FMS that, in turn, may be due to comorbid disorders such as Developmental Coordination Disorder (DCD).

Harvey and colleagues (2009) suggested poor FMS performance may affect the time spent in PA because children with ADHD may experience challenges that include low rates of participation, lack of knowledge about action, negative personal feelings and poor physical fitness (Harvey & Reid, 2003; Harvey et al., 2009; Pan et al., 2017). Harvey et al. (2009) also suggested that children with ADHD participated in different PAs and then withdrew quickly, not taking enough time to learn the intricacies of each chosen activity. Furthermore Harvey, Wilkinson, Presse, Joober and Grizenko (2012) conducted semi-structured interviews of six

children with ADHD who spoke about their PA stories through a scrapbook interviewing method pilot project. They discovered children with ADHD and their parents were seeking new ways to be active and socially included. As previously observed, the children demonstrated poor FMS skill performance. Harvey et al. (2014) assessed the FMS skills of 10 children with ADHD where they found children also demonstrated poor FMS performance. They interviewed the children and the qualitative themes that emerged were centered around context, play, and organization. Children all participated in PA, with some children who said they planned while others did not. Finally, they also mentioned their experiences related to exclusion from PA.

Second, some studies have tested the intervention effects of PA on children with ADHD. These studies are limited in number, may not be published, often lack a control group, and do not typically include a clinically diagnosed sample (Gapin, Labban & Etnier, 2011; Harvey & Reid, 2003; Harvey et al., 2005). Morand, (2004) conducted a 12-week martial arts intervention for children with ADHD that were divided into separate martial arts, PA and control groups. Morand found participants from the martial arts group and PA group showed an increase in percentage of homework completed, of preparedness in the classroom, and overall improvements in academic performance. There was a decrease in the number of rules broken in the classroom and the number of times that participants inappropriately left their seats. This study provided support for the use of PA as a tool for minimizing maladaptive behavior for children with ADHD (e.g. redirection to task, inappropriately calling out in class, and leaving seat in class). Thus PA may be able to positively affect the prosocial behaviors of children with ADHD.

Some research has shown there are benefits for the use of PA as positive reinforcement for children with ADHD. Azrin, Vinas and Ehle (2007) focused on behavior and rewarded a 4-year-old boy's attentiveness with a 1-minute break where the child was allowed to play in an

adjacent playground. He continued to receive positive reinforcement to maintain his attention span and stay focused for longer periods of time. The study revealed that the participant increased his attention span and decreased the number of behavioral outbursts through play.

Verret et al. (2010; 2012) demonstrated that PA participation improved FMS, behavior and information processing. FMS skills were assessed with the TGMD-2 and subdivided into locomotor and object control skills. Improved behavior included self-regulation as well as improved inattention, hyperactivity, and impulsivity that was measured with the Child Behavior Checklist (Achenbach, 1991). Information processing was measured through the Test of Everyday Attention for Children (Manly, Robertson, Anderson, & Nimmo-Smith, 1999) where improvements were shown in auditory attention and visual research. The researchers concluded that a structured PA program could improve cognitive functions and self-regulation in children with ADHD. These findings support a future need for similar research in PA for this population. For example, there is also evidence that PA benefits cognitive functioning in general and executive functioning specifically that, in turn, provides indirect support for the hypothesis that PA is capable of effecting the cognitive symptoms of ADHD (Gapin et al., 2011). Research showed that chronic and acute PA may have positive effects on cognitive performance (Lambourne & Tomporowski, 2010).

Smith et al. (2013) examined the effects of an 8-week PA program designed to maximize moderate-to-vigorous PA. Seventeen children, from kindergarten to grade three who exhibited four or more hyperactivity and impulsivity symptoms, participated. PA intervention sessions lasted 30 minutes per day for five weekdays. The researchers administered cognitive, motor, social, and behavioral functioning measures pre- and post program. They also assessed response inhibition weekly and coded negative behaviors daily. Results showed significant increases in

the gross and fine motor task proficiency of the children. The study concluded sustained involvement in structured PA could be beneficial for children with ADHD (Smith et al., 2013).

Cornelius, Fedewa and Ahn (2017) conducted a systematic review and found that aerobic PA (i.e., tag games, soccer, basketball, etc.) improved the emotions and moods of children with ADHD more so than non-aerobic PA (i.e., yoga, relaxation training, etc.). Results showed that there was an overall moderate-to-large effect of PA on children with ADHD and a significant effect of PA on emotion and mood. This result supports emerging findings that aerobic PA may enhance children's cognition, behavior and mood (Raine et al., 2013).

Pan et al. (2017) explored a 12-week simulated developmental horse-riding program and fitness training. Participants included 12 boys with ADHD and 24 typically developing boys, aged 7 to 14 years. The Bruininks–Oseretsky Test of Motor Proficiency-2 (BOTMP-2; Bruininks, 1978) test for assessing motor skill. The PACER and Brockport Physical Fitness Test (BPFT; Winnick & Short, 1999) were used to assess physical fitness. Both motor skills and physical fitness were assessed pre- and post program. Results showed that significant improvements were observed in both motor skills and fitness for all participants. Thus, the ADHD group improved in motor performance, cardiovascular fitness, and flexibility scores after a 12-week program.

PA and Parental Beliefs. Research on children's PA behavior has shown that there is a complex arrangement of influences that may impact their involvement (Bois, Sarrazin, Brustad, Trouilloud & Cury, 2005). These influences may include coaches, teachers and parents. For example, parents are considered to be one of the primary influences on children's PA levels (i.e., parents, guardians, other adult caretakers in the home) as they spend a majority of their time with

family during developmental years (Lindsay, Sussner, Kim, & Gortmaker, 2006; Sallis, Prochaska, & Taylor, 2000).

A review by Edwardson and Gorely (2010) found cross sectional studies that showed a positive association between parental involvement and overall PA in children. Direct parental participation in PA increased the chances of PA participation for children between 6-11 years. Children were more likely to engage in PA if they perceived their parents to be physically active. Parents' behaviors towards each individual child may be determined by beliefs, attitudes and values they hold. The way in which parents behave, model, or provide opportunities may influence their children's beliefs and values. This helps the child determine their behavior (Horn & Horn, 2007). Similarly, the parental socialization model (Fredericks & Eccles, 2004; Eccles et al., 1998) explained that parent characteristics, such as culture group and education as well as beliefs and behaviors, influenced children's educational attainment and the development of skills, values and motivation. Thus, the beliefs that parents hold for their children may influence methods of interaction. For example, parents may increase individual motivation by the ways in which they encourage their children and promote positive opportunities (Bois, et al., 2005).

Bois et al. (2005) explored the role of social and psychological factors in shaping children's PA behavior. They examined parental role modeling of PA and parental beliefs of their children's physical competence. Three significant findings emerged. First, mothers' role modeling behavior seemed to be more prominent to children. This finding has been observed in other studies (Power & Woolger, 1994) and may be due to mothers being more involved in day-to-day activity choices of their children (Bois et al., 2005). The second finding showed that positive parents' beliefs about children's PA aptitudes shaped the children's own self-related perceptions. Children were more motivated and showed positive behavior. Last, the authors

suggested children's perceived physical competence was related to PA involvement. For example, the more children believed they were competent in PA, the more they engaged in PA.

Another factor that can increase or decrease PA in children is socioeconomic status (SES). Kercood et al. (2015) found that parents in low-income neighborhoods perceived more safety and accessibility barriers for PA than parents from higher income neighborhoods. Consequently, these parents adopted more rules that were found to restrict the time their children spent in PA engagement.

Parental support for PA showed a strong positive correlation with children's PA behavior (Gustafson & Rhodes, 2006). The support that parents can give children may take a variety of forms that include informational, emotional, appraisal, and instrumental support (Taylor, Baranowski & Sallis, 1994). Trost and Loprinzi (2011) found 69% of correlations between parental support and child PA participation to be positive and statistically significant. They also explored parenting style and family cohesion but the results were inconclusive due to lack of studies to draw conclusions. However, they suggested a family, that places value on fostering positive development and healthy communication amongst each other, may influence health-promoting behaviors in children.

Parental PA Beliefs and ADHD. Parental support is especially important when children are not naturally inclined to be athletic or competitive, as a means to help them build skills and confidence or find alternate ways to be active (Davison, Downs, & Birch, 2006). As it may be more challenging for children with ADHD to participate in PA due to poor FMS performance (e.g., Harvey et al., 2007), it is important that parents show PA support for their children. For example, research shows that parents need to respond to cues their children provide and be equipped with necessary skills to provide PA-related support (Davison, et al., 2006). For

instance, when a child demonstrates low perceived competence in a particular PA, parents may help to find and structure ways for their child to practice necessary skills in an informal setting (Davison, et al., 2006). This parental support may help the child build confidence and change individual perceptions. With a healthy parent-child dyad, parents and children may identify activities or sports in which success and competence can be achieved (Davison, et al., 2006).

There have been five main studies that have explored the PA perceptions of parents for children with ADHD (Doyle, Wallen & Whitmont, 1995; Gapin & Etnier, 2014; Rasmussen & Gillberg, 1983; Stewart, Pitts, Craig & Dieruf, 1966; Szatmari, Offord & Boyle, 1988). Stewart, Pitts, Craig and Dieruf (1966) explored the life histories of a group of 32 boys and 5 girls with "hyperactive child" syndrome by conducting standardized interviews with their mothers. They also interviewed mothers of a control group consisting of 31 boys and 5 girls without hyperactivity who were also in first-grade. The interview questionnaire touched upon the history of the disorder, past and present symptoms, medical and developmental history, family history and school history. The mothers of the hyperactive children suggested their child's behaviors and schoolwork were variable. They also reported their child had poor motor coordination and did not excel in sports or gymnastics. They further mentioned a lack of fine motor skills.

Rasmussen and Gillberg (1983) analyzed general health data and pediatric examination findings from the retrospective memories of mothers from a group of 141 children who were divided into three diagnostic groups and one control group. The first group included children with minimal brain dysfunction (MBD), a dysfunction that was marked by signs of cross-situational attention deficit disorder (ADD) and a combination of gross motor, fine motor, or perception dysfunctions. The second group, motor perception dysfunction (MPD), was comprised of children who showed signs of fine motor dysfunction or perception dysfunction,

but not signs of ADD. The third group was children with ADD. These children showed cross-situational signs of attention deficit without signs of motor perception dysfunction. Finally, the control group was composed of children with minimal problems in pre-school and who did not have any of the above-mentioned diagnoses. Data collection was performed by the same examiner from an out-patient clinic who was blind to the group assignment. Pediatric assessment included a detailed questionnaire that explored each child's medical, developmental and behavioral history. Each mother completed the questionnaire and was interviewed by psychiatrists about pregnancy, neonatal records and other relevant medical records.

The study results indicated that six questions had the greatest capacity for discriminating between MBD and the comparison group. They were the questions that focused on development of speech, general motor development, gross motor control, fine motor control, locomotion and inattention. Hence, the study results showed the MBD group scored the highest in all of the six questions. For example, 40% of mothers reported their child's speech developed late while 33% of the mothers suggested their child had difficulties concentrating. Further, 26% of mothers reported that their child's motor skills developed late.

Szatmari, Offord and Boyle (1988) conducted the Ontario Child Health Study (OCHS) to study associations between ADHD and various developmental and psychosocial correlates. The study sample was representative of the children in the province of Ontario because it was randomly selected from 1981 Census of Canada data. This study used survey instruments to: (a) screen for eligible children and households, (b) obtain information on the correlates, associated impairments, utilized services and demographics, (c) gain parent perspectives, mostly mothers, on family functioning and interpersonal relationships and (d) utilize diagnostic checklists to make diagnoses. The sample was composed of data from the families of 157 children with

ADHD and 2,544 children without ADHD. Study results demonstrated significant differences between the groups on self-reported variables associated with developmental delays (i.e. trouble with speech, clumsy, slow to walk, slow to talk, and low birth weight).

Doyle, Wallen and Whitmont (1995) explored the motor behaviors of 38 children with ADHD, average age of 9 years and 7 months, through the use of standardized measures. Gross motor skills were measured for the children with ADHD through the use of the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP; Bruininks, 1978). The Fine Motor Composite and the Short Form for motor ability were used. The Quick Neurological Screening Test (QNST; Mutti, Martin, Spaulding, & Sterling, 2012) was also used to provide information on the neurological basis of motor skill performance. The BOTMP results suggested that most children scored above average in gross motor skills (i.e. Short Form) compared to fine motor skill performance. Results of the QNST were consistent with those of the BOTMP as 84% of the sample scored in the normal range of the performance categories.

Additionally, parents were interviewed to better understand the relationship between parental perceptions of the motor behaviors of their child with ADHD. The parents' motor skill rating scale was used during the interview for parents to rate each child's gross and fine motor skills. Parents reported that gross motor skills were more positively rated when compared to fine motor skills. Finally, the correlational analysis suggested parent ratings of gross motor coordination were significantly associated with the BOTMP Short Form and QNST. This finding suggested that parents were aware of the general gross motor abilities of their child with ADHD.

More recently, Gapin and Etnier (2014) explored the relationship between ADHD and PA by having the parents of 68 children with ADHD complete an internet survey to assess how PA influenced their child's symptoms. PA in this study was defined as "activity that causes rapid

breathing and fast heart beat for 30 consecutive minutes or more at least three times per week" (Gapin & Etnier, 2014, p. 321). The majority of the children (85%) were reported to use medication to treat ADHD. The parents were asked exploratory questions. For example, they were asked if they noticed a difference in ADHD symptoms for inattention, hyperactivity or impulsivity as well as academic performance after PA had been performed. If parents reported a difference they were asked how and if it was positive or negative. The data collected were analyzed using chi-square goodness-of-fit tests. The results showed a greater percentage of parents reported PA had a positive and broad impact on their child's behavior. PA seemed to have positive effects on all the four domains (e.g., inattention, hyperactivity, impulsivity & academic performance). The findings suggest PA may be generally perceived as effective for improving behavioral symptoms in children with ADHD. Gapin and Etnier (2014) suggested PA is a widely available and well-tolerated intervention for many people. Hence, they also suggested that it is also likely to be a feasible activity for individuals with ADHD as evidence suggests that it may benefit symptom management in conjunction with pharmacological interventions.

These five studies demonstrate that parents are aware of the motor behaviors and PA of children with ADHD. However, Harvey and Reid (2003) suggested that further investigation of parental perceptions of the FMS performance and PA of children with ADHD was important because a majority of parent studies were retrospective or asked few questions about the reasons for the associated movement challenges. They suggested that retrospective views were important but the prior research findings may not have represented deeper and richer forms of knowledge related to current movement performance challenges. Hence, the current study explored retrospective and current PA perceptions for parents of children with ADHD.

Conclusion

The purpose of this review of the literature was to provide a global understanding of ADHD and explore potential relationships between children with the disorder, parents and PA. It is clear that ADHD can be a lifelong disability, with several studies that suggest symptoms may be improved by the use of medication. Fortunately, there are a growing number of researchers who have also been recommending PA as an adjunct to compliment treatment through stimulant medication use. This literature review touches upon how families with a positive parent-child dyad may ultimately serve as a means for increasing communication and enjoyment of PA. While this review has helped to describe and understand the complexity of ADHD and its management, I hope it will also contribute to the advancement of research in parental beliefs of PA and children with ADHD.

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Listening to parents stories about physical activity for children with ADHD

Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most frequently encountered childhood developmental disorders that affects 8% to 10% of children worldwide (Biederman & Faraone, 2005; Brown et al., 2001). Fundamental movement skill (FMS) and physical activity (PA) participation challenges for children with ADHD remain largely misunderstood despite increasing numbers of research studies that have explored the phenomenon. Presently, there are few studies that have been conducted with parents of children with ADHD in the PA context. Hence, it was deemed timely and necessary to explore parental perceptions in relation to the PA experiences of children with ADHD. The current study explored retrospective and current perceptions of parents about the PA experiences of children with ADHD. The following central research questions guided this study: What do parents perceive about the PA experiences of their child with ADHD? How were the parents involved in their child's PA? Ten mothers and one father participated in individual interviews. A thematic analysis was conducted to interpret the interview data (Braun & Clarke, 2006). The "*Activity", "ADHD", "Play", "Family Experiences", and "Isolation"* themes emerged from the parent interviews. Three important findings emerged from this study. First, the findings showed all of the children were active in one way or another and both parents and children were making an effort to participate in PA. Second, the parents knew that their children experienced challenges when performing FMS. Third, the parents collaborated with their children to provide support and encouragement to become physically active. Thus, it is important for children and parents to choose PA together to become physically active, avoid social isolation and learn how to interact with other children. This current study is significant because it is one of the first to explore retrospective and current parent perceptions.

Listening to parents stories about physical activity for children with ADHD

The fundamental movement skill (FMS) performance and physical activity (PA) participation challenges for children with Attention Deficit Hyperactivity Disorder (ADHD) remain largely misunderstood despite increasing numbers of research studies that have explored the phenomenon. ADHD is one of the most frequently encountered childhood developmental disorders (Brown et al., 2001) that affects 8% to 10% of children worldwide (Biederman & Faraone, 2005). Canadian prevalence rates ranged between 2.9% to 5% (Brault & Lacourse, 2012; Cardin et al., 2011; Charach, Lin, & To, 2010), with a 4.1% rate reported for school-aged children in Quebec (Brault & Lacourse, 2012). The number of children affected by ADHD is significant, given youth represent nearly 31% of the Canadian population (Stats Can, 2013).

The symptoms of ADHD typically include developmentally inappropriate levels of inattention, hyperactivity and impulsivity, or a combination of the three behaviors, which may cause significant impairment in daily functioning (APA, 2013). ADHD symptoms usually occur in an array of settings and affect different life contexts (APA, 2013). Children with ADHD are also subject to a high rate of comorbid disorders (Brown, 2007). For example, Barkley (1998) suggested approximately 30% of children with ADHD also had a learning disability and 50% of children experienced academic difficulties. Children with ADHD, who have a comorbid disorder, are at a higher risk of cognitive, social and psychological impairments (Litner, 2003). For example, children with ADHD have struggled due to academic failure, poor social behaviors at home and school, including difficulties with forming peer relationships (Litner, 2003).

Children with ADHD may also be at risk for problems of PA participation despite stereotypic portrayals of the children as being athletic and learning better through their physical bodies (e.g., Anderson & Rumsey, 2002). For instance, several research studies demonstrated

children with ADHD performed poorly on movement skill tests (Van der Meere et al., 1992; Harvey & Reid, 1997, 2003; Harvey et al., 2007, Verret et al., 2010; Pan et al., 2017). In fact, Harvey and Reid (2005) suggested the challenges associated with FMS were not well understood. For example, Harvey and colleagues (2007, 2009) suggested the following 10 potential reasons for the movement skill challenges: (1) a lack of physical skills and experience, (2) difficulties in the development of relationships and prosocial behaviors, (3) cognitive issues (e.g., inability to self regulate, inadequate problem solving skills, limited domain-specific and declarative knowledge), (4) comorbid disorders, (5) motivation, (6) time constraints, (7) stimulant medication, (8) an inability to use observational learning models, and (9) learned helplessness. The final reason was potential misperceptions of parents and teachers who reported that children with ADHD had poor movement and sport skills.

Harvey and Reid (2003) identified four studies that included parents in PA research designs (Doyle, Wallen, & Whitmont, 1995; Rasmussen & Gillberg, 1983; Stewart, Pitts, Craig, & Dieruf, 1966; Szatmari, Offord & Boyle, 1989). Stewart, Pitts, Craig and Dieruf (1966) explored the general life histories of a group of 32 boys and 5 girls with and without hyperactivity, 5-11 years, by conducting standardized interviews with their mothers. The mothers of the hyperactive children reported their child had poor fine motor coordination and did not excel in sports or gymnastics.

Rasmussen and Gillberg (1983) explored general health information and pediatric examination data from the memories of mothers from a group of 141 children between 6.8-8.3 years. The mothers were categorized into three distinct diagnostic groups and one control group: minimal brain dysfunction (MBD), motor perception dysfunction (MPD), attention deficit disorder (ADD) and children without any reported disability. Pediatric assessment included a

detailed questionnaire that explored each child's medical, developmental and behavioral histories. Each mother completed the questionnaire and was interviewed by psychiatrists about pregnancy, neonatal records and other relevant medical records. The researchers found six interview questions discriminated between MBD and the comparison group. These questions focused on the development of speech, general motor development, gross motor control, fine motor control, locomotion and inattention. Significant differences were found between the MBD and comparison groups on inattention, speech development, general motor development, and gross and fine motor control. For example, 40% of mothers reported their child's speech developed late while 26% of mothers reported delayed motor development. They also described their children as being clumsy in both fine and gross motor control (e.g., 21%, 24% respectively). There were no significant differences between the ADD-only and the comparison groups. Given that the MBD group consisted of children with signs of both ADD and MPD, the study results may demonstrate the effects of comorbid diagnoses on the motor behavior of children with ADHD.

Szatmari, Offord and Boyle (1988) conducted the Ontario Child Health Study to explore associations between ADHD and various developmental and psychosocial correlates. The sample was representative of the children in the province of Ontario because it was randomly selected from 1981 Census of Canada data. This study used survey instruments to: (a) screen for eligible children and households, (b) obtain information on the correlates, associated impairments, utilized services and demographics, (c) gain parent perspectives, mostly mothers, on family functioning and interpersonal relationships and (d) utilize diagnostic checklists to make diagnoses. The sample was composed of data from the families of 157 children and adolescents with ADHD and 2,544 children and adolescents without ADHD between the ages of 4-16 years.

Study results demonstrated significant differences between the groups on self-reported variables associated with developmental delays (i.e. trouble with speech, clumsy, slow to walk, slow to talk, and low birth weight).

Doyle, Wallen and Whitmont (1995) explored the motor behaviors of 38 children with ADHD, average age of 9 years and 7 months, on the Fine Motor Composite and the Short Form for motor ability of the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP; Bruininks, 1978) and the Quick Neurological Screening Test (QNST; Mutti, Martin, Spaulding, & Sterling 2012). The results from the scaled scores of the BOTMP suggested most of the children could be placed in the average and above average performance categories for the fine motor composite and short form (e.g., gross motor skill estimate). The scaled scores were significantly better for gross motor skills when compared to fine motor skills. The QNST results were consistent with the BOTMP results as 84% of the sample scored in the normal range on the percentiles for the test's performance categories. The children's parents were also asked to fill out a questionnaire to better understand the relationship between parental perceptions of the motor behaviors of their child with ADHD. The parents' motor skill rating scale was used during the interview for parents to rate each child's gross and fine motor skills. Parents reported that gross motor skills were more positively rated when compared to fine motor skills. Finally, the correlational analysis suggested parent ratings of gross motor coordination were significantly associated with the BOTMP Short Form and QNST. This finding suggested that parents were aware of the general gross motor abilities of their child with ADHD.

More recently, Gapin and Etnier (2014) explored the relationship between ADHD and PA by having the parents of 68 children with ADHD complete an internet survey to assess how PA influenced their child's symptoms. PA in this study was defined as "activity that causes rapid

breathing and fast heart beat for 30 consecutive minutes or more at least three times per week" (Gapin & Etnier, 2014, p. 321). The majority of the children (85%) were reported as being prescribed medication to treat ADHD. The parents were asked exploratory questions to observe if they noticed a difference in ADHD symptoms for inattention, hyperactivity or impulsivity as well as academic performance after PA had been performed. If parents reported a difference, they were asked how and if it was positive or negative. The data were analyzed using chi-square goodness- of-fit tests. The results showed a greater percentage of parents reported that PA had a positive and broad impact on their child's behaviour. PA seemed to have positive effects on all four domains (e.g., inattention, hyperactivity, impulsivity & academic performance). The findings suggest PA may be generally perceived as effective for improving ADHD symptoms.

In summary, the five studies included (a) behavioral observational investigations where a broad range of information was obtained to address multiple developmental factors, but had a narrow focus on PA performance variables (e.g., Rasmussen & Gillberg, 1983; Stewart et al., 1966; Szatmari et al., 1989); (b) retrospective investigations where medical histories were obtained from parents, with questions related to the child's prior PA experiences (e.g., Stewart et al., 1966), (c) child motor behavior tests (Doyle et al., 1995) and/or (d) parent questionnaire data (Doyle et al., 1995; Gapin & Etnier, 2014).

Harvey and Reid (2003) suggested that further investigation of parental perceptions of the FMS performance of children with ADHD was important because of the retrospective nature of the studies. For example, a parent could be asked to report on the childhood PA experiences of their child when the person was actually much older (e.g., an adolescent). They suggested that retrospective views were important but the research findings may not have represented deeper and richer forms of knowledge related to current FMS performance challenges. Additionally,

very few questions were asked about the children's FMS and play behaviors in all of the five studies. Finally, there have been few qualitative research studies to explore the parental perceptions of PA experiences of children with ADHD (Harvey et al., 2009), despite the research studies that demonstrated parents may play an important role in PA participation for typically developing children (Trost, Sallis, Pate, Freedson, Taylor & Dowda, 2003). In other words, few studies have been conducted in the PA context for the parents of children with ADHD. Hence, it was deemed timely and necessary to explore parental perceptions in relation to the PA experiences of children with ADHD. Thus, the current study explored retrospective and current PA perceptions for parents of children with ADHD. The following central research questions guided this study: What do parents perceive about the PA experiences of their child with ADHD? How were the parents involved in their child's PA?

Method

Qualitative research is a form of social study that focuses on the way researchers interpret and make sense of individuals' experiences and the world in which they live (Sparkes & Smith, 2014). Hence, the work of a qualitative researcher is to describe these different experiences by relying on the voices of research participants (Sparkes & Smith, 2014). This qualitative study represents a preliminary attempt to interview parents of children with ADHD in the PA context. It employed a within-case design to gain an understanding of parent perceptions about the PA experiences of children with ADHD (Merriam, 1998; Stake, 1995). Study participants, semi-structured interviews, thematic analysis and trustworthiness are discussed below.

Participants

Eleven parents of children with ADHD were conveniently recruited for this study. Their children, between 9 -12 years, had participated in related studies that explored PA experiences

(Harvey, Wilkinson, Presse, Joober & Grizenko, 2012, 2014). They were part of a criterion-based sample that was obtained from an ADHD clinic at a psychiatric hospital in Quebec, Canada. Each child was referred to the associated study by the treating child psychiatrist to ensure each child received a reliable diagnosis of ADHD (*Diagnostic and Statistical Manual of Mental Disorders* [DSM–IV], APA, 2000). Each child and parent spoke English so the interviews could account for potential linguistic terminology differences across French and English languages.

The current study was linked to the previous studies (e.g., Harvey et al., 2012, 2014) but it focused on parent interviews only. Thus, the participants were one parent of a child with ADHD. The convenience sample included 10 mothers and one father. Each participant signed an informed consent form for their child and them to participate in the study only after approval had been received from the Institute's Research Ethics Board. Parents, who chose to participate in the study, were interviewed after the completion of movement skill tests and semi-structured interviews for their child. Any identifiable information was removed throughout this text to protect each participant's anonymity. For example, participant numbers were used as pseudonyms to protect each participant's anonymity throughout this text.

Semi-Structured Interviews

All data were gathered by the principal investigator (PI) of the entire research project (e.g., child & parent studies). He conducted a semi-structured interview with each parent in a private room at his PA lab. The following procedures were followed so each parent could speak about the perceptions of his or her child's PA experiences. Each interview session was conducted in the English language by the PI. He decided to conduct the interviews because some of the parents could have been previously involved in a service-learning project that undergraduate and

graduate students from his research team had been directly engaged in. Since the PI was much less involved in the service-project with the parents, he believed the participants would feel more at ease speaking with him.

The following questions were asked during each interview. Can you please tell me about some of your child's physical activity experiences? How are you involved in her/his daily physical activities? Why? Why not? What about play dates? In the best of all worlds, what type of activities would you want your child to do and why? Is the financial cost an issue to participation in physical activity for your child? Participants were probed about their answers throughout the interview when the interviewer wanted to obtain a deeper understanding about a specific topic.

Each interview was videotaped with a digital video camera. The videotaping procedure was used to enable the researchers to review the interviews, perform the verbatim transcriptions and capture any nuanced language demonstrated by the participant (Harvey et al., 2012). This last method helped to increase accuracy when the data were transcribed. For example, nuanced language may be defined as a participant who provided a verbal response but then indicated a contradictory response through body language. For example, a participant may have stated that his or her child loved to perform PA but then rolled his or her eyes at the same time. This nuanced language may demonstrate the participant was being sarcastic and depicted a different finding when analyzed (Harvey et al., 2012). The duration of the interviews ranged between 20-40 minutes.

Thematic Analysis

All interviews were transcribed verbatim. A lead researcher (LR), the graduate student of this thesis, was designated to perform all of the data analysis and ensuing interpretations. The LR

reviewed all transcriptions and she conducted a thematic analysis that consisted of a 6-step inductive process (Braun & Clarke, 2006). A thematic analysis has the potential to help the researcher write an unrestricted interpretation of the data that may not be connected to a specific theory (Sparkes & Smith, 2014). Therefore, an atheoretical approach was used during this thematic analysis (Sparkes & Smith, 2014). First, all interview transcripts were read and re-read many times to better familiarize the LR with the contents of the interview data. Next, all meaningful sentences, or phrases, of the interview data were reviewed so that the LR could start to generate initial codes. Third, a search for candidate themes began by sorting and collating codes that had been developed and named from the data extracts (e.g., quotes) and reflected participants' experiences (e.g., such as 'going for walks in the evening'). Fourth, a review of themes was performed. Hence, similar candidate themes were reviewed and combined in an iterative process to represent broader level categories (i.e., sub-themes). For example, the codes 'going for walks in the evening' and 'we go bicycling together' were combined into a sub-theme called 'activities' that related to parent descriptions of the activities that their child with ADHD participated in. Fifth, the sub-themes were reviewed, refined and finally re-organized to represent five broad themes. For example, the subthemes 'affordances', 'child views' and 'playmates' were combined to form the theme of 'play'. The sixth and final step of the thematic analysis was the production of the report where compelling extracts were selected to best represent the study's themes and sub-themes (Braun & Clarke, 2006). Meaningful terms were identified from each participant's interviews, based on the LR's experiences**.**

Trustworthiness

The establishment of trustworthiness is essential during qualitative research to ensure the research process is well conducted and the findings may be considered as credible. Zitomer and

Goodwin (2014) developed guidelines for qualitative research in adapted physical activity and they identified six areas where researchers could encourage trustworthiness of their studies (e.g., researcher reflexivity, coherence, credibility, resonance, contribution & ethics). They also identified a number of strategies within each area to encourage trustworthiness but did not suggest that all of the listed strategies be used for researchers to ensure trustworthiness. They cautioned against being labeled as a criteriologist and recommended a flexible approach where a series of strategies could be used to encourage trustworthiness. A discussion of each area and related strategies are provided to suggest that this study may be considered to be trustworthy.

Zitomer and Goodwin (2014) suggested researcher reflexivity in qualitative research involves the awareness of the researcher throughout the research process because it refers to the researcher's relationship with the study. It is not only the subjective experiences of the study participants that are important but also the subjectivity of the researcher. Vannini, Waskul and Gottschalk (2012) suggested reflexivity is the act of putting oneself in somebody else's shoes and imagining how this other perceives their experiences. Thus, it is important for the researcher to consciously reflect about his or her professional and personal backgrounds as well as theoretical assumptions.

Zitomer and Goodwin (2014) suggested reflexivity could be demonstrated through the disclosure of researcher bias and bracketing. I, as the LR, reflected on my many experiences with families of children with ADHD to disclose my researcher bias. For example, I did not know very much about the disorder when I first started working with children with ADHD about seven years ago. My knowledge was not profound and it had only been based on few readings. At that point in time, my understanding of children with ADHD would only begin to scratch the surface of the disorder's complexity. However, I began to realize how much more complex people with

ADHD were when I started to teach in the service-learning project and worked closely with children with the disorder. My assumptions have continued to evolve since that time. Now I recognize that this disability affects the whole person as well as his or her surroundings. I know now that it is difficult for children with ADHD as their disability may include cognitive, physical and social impairments. Hence, I was able to observe the difference in their attitudes and behaviours when they were part of a structured teaching and learning environment that was geared towards their unique needs.

Bracketing was performed, which helped the researcher stand aside from existing beliefs and assumptions about a phenomenon (Allen-Collinson, 2016). A critical friend, the PI, also continuously asked the LR questions about how her own experience would influence or shape the interpretations made in the thematic analysis (Sparkes & Smith, 2014). He aided in questioning the LR to think and reflect upon different interpretations throughout the study. In turn, the LR was able to question the assumptions that the PI held about children with ADHD and their families. This process helped the LR to provide a unique interpretation that enabled the voices of the participants to be heard.

Zitomer and Goodwin (2014) indicated qualitative research should be coherent. Coherence suggests that a study is consistent, uses a clear methodology from beginning to end, achieved its purpose and creates a link to previous research. The case study design was selected for this study to explore the parent's perceptions about their child's PA experiences. Data triangulation was performed through knowledge of the semi-structured interviews and FMS results for the children with ADHD (Harvey et al., 2012, 2014) as well as the interview data from the parents. Thus, clear links were made between the results and previous research that should improve the study's coherence (Zitomer & Goodwin, 2014).

Zitomer and Goodwin (2014) also suggested that credibility is an important part of trustworthiness. It was defined as ensuring study results represented experiences shared by the participants. It is the ability to identify with the research findings and interpret the research with confidence. They suggested that credibility may be achieved through member checks, prolonged engagement and a description of the analysis. These three points are discussed to suggest that the study may be considered as credible. Member checks were used in this study. However, unlike other studies where participants return to complete a member check, this interview procedure was tailored to the study and was practical and sensitive to the nature of the research participants (Sparkes & Smith, 2009). For example, Harvey et al. (2012) suggested that parents would often forget to return for follow-up appointments so member checks were embedded within interview times. Parents were asked to confirm the meaning of interview responses every 5–7 min to (a) make sure parent's perceptions were not being misinterpreted (Creswell & Miller, 2000) and (b) provide parents with the opportunity to add or change any parts of their answers.

Prolonged engagement was a major study component. The LR was the main person to speak to parents and teach children with ADHD throughout several consecutive years of the research lab's service-learning project. For example, she had been part of the project for seven years at the undergraduate and graduate levels. She taught social skills through PA to children with ADHD for a majority of the time. During one semester, she also participated in each session of the eight-week parent psychoeducation program where parents learned about the complexity of ADHD from a psychologist, social worker and nurse. In fact, she is the sole member of the research team to spend such an extended period of time with parents in the service-learning project. She was the main link between the service-learning project and parents of children with ADHD. For example, she spoke about the progress of each child with ADHD after every session

for each of the hundreds of parents that she encountered over the time period of the service-learning project. These interactions with the children and their parents represent a form of prolonged engagement for the LR. She was able to acquire an understanding of children with ADHD and their parents. The PI considered these vital experiences when assigning the LR to interpret the data gathered for the parent interviews. Finally, the process of the thematic analysis was also provided as a means to suggest that the study may be considered as credible.

Zitomer and Goodwin (2014) defined resonance as the impact a study has on its readers and the ability to draw the reader into the study. It is the ability to expand the reader's appreciation and understanding of a specific phenomenon. When a study resonates well with the reader, the ability to transfer findings to their context may happen seamlessly. This study used deep and thick descriptions of parent experiences, thus, hoping to draw readers into the study and have the findings resonate at a deeper level. For instance, the examples of the participant's interview responses are in-depth and grounded in their own experiences (Pitney, 2004).

Zitomer and Goodwin (2014) suggested the contribution of a study includes its ability to contribute to a deeper understanding, extend knowledge and generate insight into various aspects of a phenomenon. They suggested that the study's contribution could be demonstrated through a research question and interpretations that were grounded in research as well as suggestions for future research. The research question was developed from the available and pertinent research in this area as was explained in the rationale for the study. For example, this study adds another layer of understanding to the phenomenon by interviewing parents about the PA experiences of their children with ADHD. Learning how parents and children choose their PA further explores research that had not previously been exhausted. Thus, this study also suggests future research and its relationship to practice.

Zitomer and Goodwin (2014) suggested ethical research is carried out in a respectful, humane, honest and empathetic way. Thus, the way values and moral principles are integrated into the study and throughout the process are important (Zitomer & Goodwin, 2014). They suggested ethical research could be demonstrated by acquiring ethics approval, informed consent, and participant welfare. Ethics approval was obtained through the institute's REB and informed consent was obtained from study participants.

Results

The *"Activity", "ADHD", "Play", "Family Experiences", and "Isolation"* themes emerged from the parent interviews. Each theme and associated subthemes are described below by providing the reader with rich and deep interview extracts. The use of quotations in each theme is to tell a story rather than to adhere to a strict number of quotes per participant or theme.

Activity

The "Activity" theme highlighted different types of activities that each participant's child engaged in. The activity time, organized activity and leisure activity subthemes constituted this theme. The first subtheme was *activity time* as parents discussed the amount of time their families dedicated to PA. Participant two said, "snowboarding is an activity we do usually every second weekend in the winter time." Likewise, participant one mentioned "well the cheerleading, it's enough. They have it twice a week already so Wednesday's two hours and on Sunday for three hours and it's tough."

The second subtheme was *organized activity* because it identified the different structured PA that the children participated in. Several of the parents talked about how their child was involved in individual or team sports. Participant eight said "Yeah, so he usually does individual sports like skating, swimming, and he did gymnastics as well." Participant six suggested his son

"plays soccer on a team," and participant two mentioned her son was "into snowboarding for the last four years now." The parents also spoke about how their children participated in recreational activities on a weekly basis. For example, participant four talked about attending a local community center for swimming lessons: "last winter she had swimming activities, so we were taking her and her younger brother to the YMCA for swimming lessons." Similarly, participant seven talked about her son's enrollment in circus school: "He takes a circus course once a week" When asked to elaborate on what types of activities her son participated in, she said "actually, he rides the unicycle and does the baton fleur, it's sticks and he can do that on the unicycle now too." School related activities were also mentioned by many of the parents. For example, participant seven elaborated on her child's school related activities: "Well in school they have gym but they also have... in recess they can participate in things like Kin Ball and things like that and then they'll have little tournaments and things like that."

The third and final subtheme of the *"Activity"* theme was *leisure activity* because parents spoke about different activities their children participated in during free time. All 11 participants talked about their child who participated in some form of unorganized play. For example, participant two said, "We do various leisure sports such as sliding. He rollerblades too and he bikes." The parents also spoke about non-physical activities that their child engaged in. Participant seven mentioned that her son was "always drawing, he makes these very meticulous drawings, with all sorts of details and things." Furthermore, participant nine expressed that his children often preferred to be less active during their free time: "He'd rather sit on the couch and watch TV and play video games. The two of them sit there and watch videos."

ADHD

The *ADHD* theme afforded parents an opportunity to discuss the treatment process and challenges associated with raising a child with ADHD. This theme consisted of the following three subthemes: treatment, challenges, and planning.

The first subtheme, *treatment*, provided insight into parent views on diagnosis, medication, and specialized services that their children with ADHD had received. For example, participant 10 talked about how her child was initially identified as potentially having ADHD. “It was the kindergarten teacher. She observed that he was really clumsy. You know, something was there. So she suggested to us to go further and look what was wrong. It was the beginning of our search.”

The parents also discussed the use of medication and the potential impact on their child’s daily life. For example, participant nine spoke about how the medication was helping his son to improve his grades. “Since he’s been on the Ritalin type drug, his marks have skyrocketed. The teachers say he’s one of the most improved kids they have ever had.” Likewise, participant 10 mentioned “We got our answer with the medication. Everything goes so well.” When participant 10 was asked what she felt improved as a result of taking medication, she said: “his social interaction in school, his grades, everything. It’s totally, I think it is a 100% success.” In contrast, participant eight felt her son’s medication wore off at night which made it difficult for him to participate in evening activities:

> Soccer was a little bit better but again at some point in time he always ends up wandering off on his own, you know, and isn’t part of the actual play that’s going on. I think it must have something to do with his ADHD and trying to concentrate

> on the task at hand, more than anything. Like when he played soccer, which was usually in the evening, his medication had probably worn off by then.

Finally, the parents also spoke about specialized services that their child was receiving. For example, participant seven talked about how her child was getting help for a learning disability. She said:

> He goes to a school which is specialized for children with learning problems so all the teachers are very prepared to deal with these issues. Like they put a lot of weight on making sure that everybody behaves and is respectful, so there it works nicely.

Participant 10 talked about occupational therapy services her child had received:

> So we started to go to occupational therapy and then we are still going. We've been going for over 2 years now. Two and a half years and it is very good for him. That helps him a lot, just writing, fine motor skills were hard for him.

The second subtheme was called *challenges* to reflect attention seeking and movement difficulties. They were identified as two of the major challenges for the participants' children when participating in PA. Participant nine mentioned that her son needed constant attention in PA to avoid attention-seeking behaviours:

> I think as long as he gets one-to-one attention, from whoever is teaching him to a certain degree, he definitely responds better and does a lot more and gets a lot more out of it. So he does need that connection with whoever is coaching him.

Several parents mentioned that their child had difficulty with movement skills:

> Soccer was too hard for him too. All of the footsteps and all of the things you need to do with that, the ball is too hard for him. He was not good enough as far as the moving, doing the little things, same as the other kids are. (P10)
>
> He started walking but it took, like I said, about 16 months and we thought that's a little late. My sister-in-law always noticed that his head was a little tilted all the time, especially when he was walking and around … his bum … he kind of had a crooked position but eventually he straightened out. I don't know. It's just the skills for certain things, walking … like I said he started late, running, bicycling took him a while but when he got it, he was good. (P6)
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> He flailed a lot and kids always think the other kid did it on purpose. Like when you did it was an accident, but when the other kid did it, it was on purpose. So he flails and you know they think "he hits me". He didn't really hit you. (P9)
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> Well, I mean, he was the last of our three children-age wise to learn how to ride a bicycle. Also, a lot of things the other two did earlier, he did them later. Actually, I think it's because he was worried. He was afraid to hurt himself. He wouldn't dare just let go. (P7)

The third and final subtheme was called *planning* because parents spoke about the overall planning process and how their children were involved in planning PA. For example, participant eight mentioned her child helped to plan his skating activities. "He follows his skating schedule. He has to be at the rink usually right after school or after supper so he has a quick supper and is at the rink again." Participant two also mentioned her son tried to plan PA: "He will call up his friends, go to the park, play football or whatever." However, many of the parents communicated that their child did not plan and they were solely responsible for planning the child's activities.

Participant 10 suggested: “Well if you do not remind him, he won’t plan anything. So you need to remind him.” Likewise, participant three said: “He doesn’t plan it. We plan it for him. We structure it because he wasn’t doing it otherwise.”

Play

The third theme that emerged was *play*. Parents spoke about their child’s perceptions of play and whom their children engaged in play with. The affordances, child views, and playmates subthemes constitute this theme. The first subtheme was called *affordances* because it highlighted the type of affordances that provided children with an increased accessibility to play. Participant three, for example, talked about how choice opened up different PA opportunities for her son: “I said choose any sport you want. We’ll do it whether it’s fencing, swimming, running, or basketball. You name it... anything you want.” Participant nine talked about motivation and how it led to his son trying new activities, “Maybe it was just the sheer force of wanting to do it. He will completely put himself out there to do it.”

The second subtheme was called *child views* because it identified how children perceived PA, responded to new PA and whether or not they liked to participate in those PA. Participant two talked about how her son thought cross-country skiing would be easy: “Yeah he thought it was something easy, that he could easily do but he noticed that going up the hill and going back down sometimes it’s not as easy as he thought it would be you know?” Similarly, participant 10 talked about how her son was afraid to participate in contact sports:

> Last fall we tried Judo. He didn’t want to try. He was afraid. We went to the first session … the first class … it was just to try. He was looking at all the kids being thrown on the ground and he got scared.

Several of the parents further spoke about how their child responded well to trying new PA through individual persistence. For example, participant two said: “He doesn’t complain and even if it takes as long as it takes, he’s just going to be out there and he’s persistent and he gets into it.” However, participant seven spoke about how her child seems to be very ambitious but found PA challenging: “If new things don’t work out, he finds it difficult.” Parent six mentioned that he played hockey once this winter with his son and he “wanted [his son] to come on, he had his stick, but he didn’t want, he was kind of… he wasn’t sure […] he wasn’t comfortable enough or stable enough on his feet to start playing hockey.

Parents also spoke about PA that their child liked or disliked. Participant six said: “He likes to ride his bike a lot. He likes to play soccer. He likes to run … what else...that’s pretty much his favorite physical activities.” Some participants stated their kids loved swimming: “She swam last year and she enjoyed it because it was winter and the pool was indoors. (P4)” As well, “He is like a fish and I think he is pretty fast. (P9)” However, some participants stated their child did not really enjoy participating in PA. Participant two suggested: “Individual sports he’s not much into it. I have to encourage him for that.” Likewise, participant eight said: “Well he just doesn’t like many sports.”

The third property of the *Play* theme was *playmates* because parents talked about who their children engaged in play with. Many of the children participated in PA with other family members. For example, participant three spoke about PA that her family enjoys doing together “In the summer, we cycle. He loves that and I think he likes the fact that he can keep up with his brother and his father. I’m now the slow one in the pack so he goes along with it.” Likewise, participant eight talked about how her son spends time with family members golfing: “They’re out there golfing a lot so this year my husband’s going to take him out to the driving range as

well and his cousin is supposed to take him golfing as well." Parents further mentioned their child engaged in PA with friends and neighbors. For example, participant two mentioned: "He plays street hockey as well with friends in the neighborhood." Participant six also said "He has a couple of neighbors that, when we get home from school, he'll see them and say 'Oh were going to go play hockey' and then his brother and him and two other kids usually play hockey."

Family Experiences

The fourth theme was called *family experiences.* The participants spoke about their own PA experiences that triggered comparisons with the PA experiences of their child. This theme consisted of the *my experiences* and *my child* subthemes. The first subtheme, *my experiences*, afforded parents with an opportunity to share their views about PA and discuss some of their past PA experiences. Many parents compared their experiences with the experiences of their children and found that their experiences were very different:

> When I was younger, I mean it wasn't the same. We had a few classes and stuff you know, and I was far away from the city so, it was not like you know we had tons of choice of activities to do. I rode my bike a lot when I was younger. I was in sports a lot in high school, not too much in elementary school. In high school I played basketball and volleyball. You name it. I did them all. (P10)
>
> We would always go outside and just play. We didn't have teletune which is on 24/7... so you know there wasn't anything on TV and we would go out and play at one of my friends. You know. You didn't have to micromanage kids the same way. I mean we would just go off and do things. We would ride our bikes to the pool by ourselves. (P9)

However, not all of the parents had different experiences from those of their child. Participant six felt that he and his son shared similar PA experiences:

> I'd say [my experiences were] pretty similar. It was more I'd go to the park with my friends. On occasion we would do things with family. You know I did hockey when I was young but I didn't stick with it because I really didn't like it. I did soccer a few years just like [my son].

Participant seven also suggested her experiences were "very similar" to those of her son. When she elaborated on what she meant by similar, she said: "Yeah, I was just on free time and I would do a variety of things. I did a lot of climbing trees and going down to the swamp and looking for frogs. We were really very free." She further suggested:

> I have nothing against, you know, competitive sports and all that but I think that part of life should also be a certain amount of freedom where you can just find out you know? I mean I've had people criticize that my kids climb trees and that tells me, of course, an accident can happen. Any child that has gone and learned how to climb a tree … they're going to hold on. It's not like they're going to pop out of the tree. They know what to do. It's something that's sort of gone … lost.

The second subtheme was *my child* where the parents' recollections of their own PA experiences triggered them to speak in depth about their child's PA experiences. Parental involvement in PA was a topic each parent especially touched upon. However, the level and type of involvement varied from family to family. Participant four said: "I try to send her on all the PED days, paying for the activities and trying to send her for their activities so that she does not feel bored and stuck inside the house." Similarly, participant 10 stated:

> We need to tell him you need to go. You need to grab your bike. It's nice out. It's good for you. Go see some friends. This is what we do. He's not going to do it on his own.

Parents also shared insight into their child's movement skills and their desire to participate in PA. For example, participant 10 felt that her son had a harder time than other children his age when playing soccer: "It's easy for them but it's too hard for him. He just can't do it." Participant two also mentioned that training in the winter was a possibility to get better at soccer. However, he didn't want to do it and he was like … oh I don't want to go there every weekend just to train."

Parents also spoke about their child's desire to participate in PA. Some of the parents felt their child was motivated while others felt that the only reason their child took part in any PA was because they were forced to do so. Participant one said: "Well she's quite active you know. She really likes it [cheerleading]. She looks forward to it." Likewise, participant two said: "I'm happy that he enjoys it (snowboarding) that much. He doesn't do it because I force him to do anything. He does it because he really finds it enjoyable." However, some parents mentioned that their child had difficulty becoming motivated. Participant three said:

> He's very tricky because, like I said one day, my husband will say let's do this and he'll really fight tooth and nail and, then after, my husband will say "oh he had a great time" … or he won't want to go to do the Friday skating but we'll see friends there and then he'll have the greatest time on earth you know?

Some parents also had concerns about health and safety. Participant two explained why she felt it was important for her child to stay active:

> I really encourage him to be active as much as possible because of the fact that he might have a chance of getting diabetes. I had gestational diabetes when I was pregnant with him. That's another reason why I try to encourage him.

Many parents also said they did not let their child go places alone for fear of something going wrong. Participant nine said: "I'm still a little eerie about letting him go to the park by himself. He has to start doing these things and I'm like, oh, what if something happens?" Parent three mentioned they lived on a busy street "and child safety now-a-days is an issue, so he won't really get up and go do anything, it's really structured."

Every parent spoke about the hopes of getting their child to be more physically active. Participant one wanted her daughter to get out of the house more: "I want her to do some activity. I don't want her to be on the computer." Participant three also said: "Just anything, just any physical activity instead of watching TV. He's not much on the computer but just anything. I don't care what it is." Participant nine felt her son could also gain some valuable lessons from participating in PA with others: "I would like him to do team sports because he needs to learn working and playing well with others and following the rules."

Isolation

The fifth and final theme, *Isolation*, discussed how constraints and social fragmentation could isolate a child from their peer groups. The first subtheme, *constraints*, highlighted the different types of limitations that often prevented children from participating in PA. Financial constraints were issues that each of the parents touched upon. For example, participant one told us: "Cheerleading is very expensive and skating is very expensive too. They get to a certain point, they have to have like a private teacher or coach. So sure it's an issue, always an issue."

Likewise parent six mentioned: “You know to register him for hockey to go every weekend very early in the morning. It’s expensive for the uniform and everything else.”

Time was also an issue that many parents spoke about:

> I guess it’s more a division of labor thing. So I’m busy taking care of dinner, and lunches, and laundry and all that stuff, so you know...it gets delegated but you know. It’s not really an issue, it’s more of a time thing. (P9)
>
> This winter we actually bought downhill skis for him and we were trying to get him to go and it hasn’t worked out. It’s not an easy plan. Besides the expense, you still have to run wherever you’re going which is a good half an hour to an hour outside from where we live so that is an issue. (P3)

Parents also identified several other constraints that prevented their children from participating in activities. Participant two, for example, talked about how her son’s academic trouble prevented him from trying out for school clubs “He wanted to do a sport activity but they were saying that you can apply. You can try-out but there’s no guarantee. But academically, I don’t think he was strong enough.” Parents also talked about how their family dynamic often limited the time available to participate in activities. Participant six mentioned that his responsibilities as a father limited the amount of time he could devote to activity. “I’m simply busy being a dad. I have [my son] one week out of two. I have shared custody with my ex-wife so I only see him one week out of two.”

The second subtheme was *social fragmentation*. Parents talked about how the social life of their child was affected by ADHD. Several of the parents mentioned their child’s behaviours had repercussions and many times resulted in expulsion from their school, that, in turn, isolated them from being with their friends. For example, parent two said “He was expelled from his old

school because of his behavior so he couldn't go back. Because of the fact that he changed schools, and all that, he has less contact with the kids around our area." Participant three mentioned "He had to actually recently change schools last year and so it's still...I think at times he has a hard time. He's a little better this year."

Parents also identified several other factors that led to social fragmentation. Participant two, for example, talked about the social stigma associated with receiving treatment for ADHD. "It's a little bit different. He kind of lost touch with those friends because he was hospitalized a little, or well he kind of got therapy you know." Some of the parents further discussed how their children had difficulty interacting in large groups. This challenge often limited the children from group play. For example, participant nine suggested her son "does things his own way. He doesn't like to be told how to do things and he is sure his way is better than everyone else's way." Likewise, participant five suggested:

> The most difficult thing is when there's more than just him and one friend. If it's not one on one there's always trouble. He could be playing with [his friend] and then if this other kid comes that's a friend of his then he and that kid will pick on [his friend]. So it's hard for him to play as a group.

Discussion

This study explored retrospective and current perceptions of parents about the PA experiences of their child with ADHD. It also inquired how the parents were involved in their child's PA. The discussion is divided into five sections that reflect the study findings in order to answer the central research questions. It further contains a discussion about the study's strengths and weaknesses as well as recommendations for future research.

Findings

The *Activity* theme was divided into three subthemes: activity time, organized sports and leisure activity. The findings demonstrate that all of the children were active in one way or another. The parents and children were making an effort to participate in PA. This is a positive finding as research shows that an increase in PA is associated with improved health outcomes (Janssen & LeBlanc, 2010). For instance, PA participation is a key component to children's health, fitness and well-being because improvements have been found in several aspects of psychological health, including self-esteem and the promotion of social contact and friendship (Shields, Synnot & Barr, 2011).

The parents also spoke about the organized activities that their children participated in. For example, they talked about organized activities that included soccer, snowboarding, cheerleading, skating, circus classes, hockey, basketball, baseball, swimming, and football. Little research has been performed for children with ADHD and sporting activities. This range of PA participation is a new finding, however, the limited evidence does suggest that boys with ADHD tend to perform better in individual sports rather than team sports (Johnson & Rosen, 2000). All of the parents further spoke about how their children participated in recreation and leisure activities. For example, the parents described an array of activities such as bicycling, rollerblading, walking the dog, golfing, playing outside and at the park, skiing and tubing. The parents mentioned that the children were, sometimes hesitant at first, but once they engaged in leisure activities, they enjoyed participation in leisure activities. This finding is important because Litner and Ostiguy (2000) suggested that participation in leisure experiences may offer a natural way to develop skills, positive behaviours and interpersonal awareness.

The *ADHD* theme included information related to treatment, PA participation challenges and planning. The parents spoke about their child's diagnosis and medications. For example, they talked about the impact of medication on their child's daily life. Several parents suggested that medication helped to improve individual behaviors and academic performance.

A large part of this theme was defined by PA participation challenges that parents identified for their children. They suggested that attention seeking and movement difficulties were major challenges for their children during PA participation. Many parents suggested their children needed one-on-one supervision to better engage in PA because the children seemed to require constant attention to participate in PA. The parents also spoke about the children's desire to participate in PA where, sometimes, the children may not have wanted to take part in specific sports. This finding is similar to Harvey et al. (2009) who stated that children with ADHD participated in different PA and then withdrew quickly, not taking enough time to learn the intricacies of each chosen activity. In fact, parents suggested that their child was not performing PA at age-appropriate levels. For example, they suggested that their children had been late to develop FMS. Some parents also spoke about their children being clumsy. This finding suggests that children with ADHD might be at risk for developmental delays in movement skills and may be due to comorbid disorders such as Developmental Coordination Disorder (APA, 2013; Harvey et al. 2007). This finding supports the previous research of Harvey et al. (2003, 2007, 2009) that suggested poor FMS performance may affect the time spent in PA because children with ADHD may experience challenges that include low rates of participation, lack of knowledge about action, negative personal feelings, and poor physical fitness.

Finally, PA participation challenges led to discussions about planning for PA. Most parents mentioned that their children didn't plan for PA while a smaller percentage of parents

suggested their child did plan for PA. Harvey et al. (2014) also suggested that some of the children with ADHD chose and organized their own PA while other children only took part in PA that was set up for them. In other words, the parents confirmed what the children mentioned during their interviews. Thus, it would be important to develop autonomy supports within the community as this may help a child's adherence to PA or team sports. For example, parents and children with ADHD may carefully select PA that can be delivered in a structured manner that may help the children to participate for longer periods of time and try to excel in PA.

The *Play* theme highlighted the parents' discussions about affordances to PA, their children's perceptions and whom they engaged in play with. The parents seemed to hold the general view that they wanted their child to be active when they spoke about affordances to PA. They didn't seem to mind what sort of PA their child was enrolled in. Many of the parents mentioned that their child was able to choose any sport that he or she wanted as long as they were active. The parents also mentioned that their children were slow to warm up to new PA and sports when speaking about the children's perceptions. Some parents further mentioned that even though it took time for the child to start enjoying a sport or PA, in the end, they were able to find a PA that they liked rather than disliked. Finally, the parents spoke about who their children engaged in play with. Many of the children participated in PA with other family members, friends and neighbors. A few parents mentioned that their children did better in smaller groups rather than larger ones. This finding supports Harvey et al.'s (2014) research where some of the children also mentioned they enjoyed playing with a smaller group of friends.

The parents spoke about their views about PA and their children's experiences in the *family experiences* theme. They all mentioned how their upbringing and that of their children had been different. For example, increase of screen time and lack of outdoor play were very different

experiences for them. They spent much less time engaged in technology (e.g., television, videogames) as compared to the children. However, all parents were motivated to help their children to become more active. All parents seemed willing to collaborate with their children to find a type of PA they would enjoy. In fact, most parents collaborated with their child to pick PA that interested their youngster.

Parental involvement in PA was a topic that each parent especially touched upon. It may be necessary for children to have parental support as it may help them build confidence and change their perceptions. With a healthy parent-child dyad (i.e., communication & support), parents and children may identify activities or sports in which success and competence can be achieved (Davison et al., 2006). For instance, when a child demonstrates low perceived competence in a particular activity, parents may help to find and structure ways for their child to practice the necessary skills in an informal setting (Davison et al., 2006). In addition, parents spoke about being active throughout their lives and all parents spoke about the hopes of getting their children to become more physically active. This new finding is exciting, given that parents are considered to be one of the primary influences of PA related behavioural patterns of youth (Lindsay, Sussner, Kim, & Gortmaker, 2006).

Parenting styles were not measured in this study but we suggest that the parents demonstrated a form of authoritative parenting when helping their children choose the type of PA. They used a warm but firm approach and were receptive to working with their children in finding a type of PA they would enjoy. On several occasions the parents mentioned their sole intention was to keep their child active and ultimately the choice of the type of PA was secondary. This finding supports research that found 69% of correlations between parental support and child PA participation to be positive and statistically significant (Trost & Loprinzi,

2011). It is important to emphasize that to gain a higher success rate, the child and parent may wish to choose appropriate types of PA. Perhaps a discussion about the importance of becoming physically active would help to reinforce the child's choice of PA. Thus, the purpose of getting involved in PA may be more important that the activity itself. This finding supports previous research that suggested that children with ADHD should be supported when determining and choosing PA (Harvey, et al., 2014).

The parents spoke about constraints and social fragmentation that could affect their child's life in the *isolation* theme. They mostly mentioned the cost of different activities when speaking about constraints. Fortunately, all parents explained they were able to find some sort of PA within their means. However, several of the parents mentioned that their child's asocial behaviours have repercussions and often resulted in consequences or expulsion from school. If expelled from school, then there may be fewer opportunities to become physically active. Similarly, Barkley (2006) reported that school-age children with ADHD were likely to have difficulties with cognition, performance in school, motor performance and self-regulation. Unfortunately, these symptoms of ADHD have been associated with poorer outcomes, causing more hardship in school (Maedgen & Carlson, 2000).

Some parents also suggested how their child had difficulty with interaction in groups as they would often end up disagreeing with others. They further spoke about challenges their children encountered with other peers. Hoza et al. (2005) also found significant difficulties in peer relationships for children with ADHD that ranged from dislike and exclusion to rejection. Fortunately, parents explained they were constantly looking for ways to support their child by suggesting participation in various PA where the child could learn to get along with others.

In summary, the parents perceived the following about the PA experiences of their child with ADHD. They suggested that the children were engaged in a variety of PA and leisure activities, learned better on an individual basis and demonstrated poor FMS. They also mentioned that few of the children planned PA. The children were slow to warm-up to new PA and a variety of factors led to social isolation. The parents were very involved in their child's PA. Their own childhood experiences were quite different from their children and they helped their child to plan and participate in PA. Thus, they acted as facilitators who provided support and encouragement for their child to participate in PA and learn how to interact with others. Finally, they were able to find a PA for their child to participate in despite poor motivation or financial constraints.

Limitations and Strengths

This study is significant because it is one of the first qualitative investigations to explore the PA experiences of children with ADHD from the perspective of their parents. Since the five previous parent studies focused mainly on retrospective views and questionnaires (Doyle, Wallen, & Whitmont, 1995; Gapin & Etnier, 2014; Rasmussen & Gillberg, 1983; Stewart, Pitts, Craig, & Dieruf, 1966; Szatmari, Offord & Boyle, 1989), another strength of this qualitative study is that current parent views were sought to further understand the PA behaviors of children with ADHD. Hence, deep and rich knowledge were captured about the parents' feelings about PA as well as unique PA knowledge for their children with ADHD. There were also a few main weaknesses of the study. First, the LR did not perform the parent interviews but her experience and prolonged engagement with the parents of many children with ADHD suggests that she was one of the most appropriate people in the lab to perform the thematic analysis. Next, the supervisor acted as a critical friend and it can be questioned whether or not he could be expected

to perform this role. However, the LR was able to question the PI about his assumptions in order to ensure that the participant's experiences reflected their interview responses. Thus, this method helped to bracket the assumptions of the LR and PI in order to interpret and present the deep and rich discussions about PA that were provided by the parents. For example, Harvey and Reid (2003) questioned if parents were knowledgeable about the FMS challenges of their children due to the retrospective nature of the studies that had been previously conducted. The LR was able to challenge this assumption because the parents were clearly aware of individual FMS challenges!

Recommendations for Future Research

The following recommendations for future research are made after considering this study's findings. First, it is important for children to choose appropriate activities to try to motivate themselves to become physically active. It is also important for the parents and children with ADHD to have discussions about the purpose of being physically active and which PA would encourage the children to be active. Hence, a study could be conducted to observe if PA participation enjoyment and adherence rates increase when the children and parents have these discussions to choose and participate in personally relevant PA. It would also be interesting to observe how the communication process between child and parent would affect: (a) the choices made about the types of PA to participate in and (b) the planning process for PA. Further, it may be important to inquire about the type of parenting style for each parent in order to understand how PA choices may be made and what would be the potential implications for PA participation. Since FMS have proven to be challenging for children with ADHD (e.g., Harvey et al., 2007), data could also be collected to see if FMS skills would also improve with additional time being devoted to PA.

Future research could further include studies in leisure education where children with ADHD and their parents would participate in an agreed upon PA, in the community, to see the effects upon PA adherence as well as the functioning of the parent-child dyad. Furthermore, it will be important to design studies that may help to decrease social isolation and assist the parents and their children to experience positive social benefits associated with PA. For example, McQuade, Vaughn, Hoza, Murray-Close, Molina, Arnold, and Hechtman (2014) suggested that while many children with ADHD experienced impaired social relationships, the potential impact of PA participation on social competence could not be overemphasized. Thus, future research should also consider improving links between home, school and community. In conclusion, this area of research is fruitful and past studies demonstrate that children with ADHD may benefit greatly from PA. Hopefully, this study's findings will lead to more in-depth research on parent-child dyads where PA may be chosen to help increase personal well-being and encourage children with ADHD to become physically active for their lifetimes.

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