PRE-SERVICE TEACHERS' PERCEPTIONS OF THE ACCEPTABILITY OF INTERVENTIONS FOR ADHD AND KNOWLEDGE OF EVIDENCE-BASED PRACTICE

by

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Abstract

Teacher factors including attitudes, beliefs, and knowledge of ADHD have the potential to affect classroom intervention efficacy and student outcomes. Fifty-seven pre-service teachers from a Bachelor of Education (BEd) program were surveyed regarding their perceptions of the acceptability of three behavioral ADHD interventions as well as psychostimulant medication. Participants' knowledge, attitudes, and use of evidence-based practices (EBP) were also surveyed. Findings indicated that participants rated the Daily Report Card as the most acceptable, effective, and timely intervention. Participants significantly preferred behavioral interventions over medication. Qualitative results indicated concern regarding the potential side effects of taking psychostimulant medications. Results of the study indicated that participants' self-reported knowledge of EBP was significantly higher than attitudes and current use of EBP. A significant between subjects' effect of year of study was observed such that participants in their first year of teacher training held significantly more positive attitudes towards EBP than participants in their second year. Practical implications for pre-service training, school psychologists, and future research are discussed.

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CHAPTER ONE

Literature Review

Attention-Deficit Hyperactivity Disorder

Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders in school age children and is associated with negative outcomes across the lifespan (Fabiano et al., 2009). ADHD begins in early childhood and persists throughout the lifespan; it is characterized by marked deficits in attention and elevated hyperactivity-impulsivity (American Psychiatric Association [APA], 2013). Recent estimates suggest that the prevalence rate for the disorder is approximately 2% to 9% of children in North America (Wilens & Spencer, 2010). The disorder is more common in boys than in girls; for approximately every three boys with the diagnosis there is one girl with the diagnosis (Willcutt, 2012). Recent studies investigating the etiology of the sex difference have found evidence of both genetic and cognitive differences (Arnett, Pennington, Willcutt, DeFries, & Olson, 2015). Behavioral symptoms of ADHD include increased distractibility, difficulty sustaining focused attention, hyperactivity, and impulsivity (APA, 2013).

Children with ADHD are at risk of academic and behavioral difficulties such as underperformance on classwork and tests, poor study skills, and disruptive behavior (DuPaul & Eckert, 1997; DuPaul, Gormley, & Laracy, 2013; Merrill et al., 2017). A significant minority (i.e., approximately 45%) of children with ADHD struggle with severe academic deficits and meet diagnostic criteria for a comorbid diagnosis of a learning disability (LD) (DuPaul, Gormley, & Laracy, 2013). Additionally, children with the disorder are more frequently held back to repeat a grade and are at an increased risk of later school dropout (Barkley, Murphy, & Fischer, 2008). Furthermore, children with the disorder comprise a significant portion of students

who receive special education accommodations (Fabiano et al., 2010). ADHD is associated with negative societal perceptions, including inaccurate beliefs about the disorder (e.g., children with ADHD are willfully disobedient or the disorder is caused by poor diet) (Bell, Long, Garvan, & Bussing, 2011), increased interpersonal conflict with peers, siblings, parents, and teachers (Fabiano et al., 2009), as well as increased risk of later substance abuse, delinquency, and unemployment (Walther et al., 2012; APA, 2013). In sum, ADHD is a lifelong disorder that may lead to significant impairment in functioning across a broad range of areas including social, occupational, and academic domains.

Diagnostic Criteria and Etiology The current edition of the Diagnostic and Statistical Manual (DSM-5; American Psychiatric Association, 2013) defines three diagnostic presentations of ADHD: (1) Predominately inattentive presentation (i.e., six or more symptoms of inattention present for at least six months), (2) Predominately hyperactive-impulsive presentation (i.e., six or more symptoms of hyperactivity-impulsivity present for at least six months), and (3) Combined presentation (i.e., six or more symptoms each from inattentive and hyperactive-impulsive presentations for the past six months). Although there is no known singular cause of ADHD, research from the fields of genetics and neuroscience has found the etiology of the disorder to have both genetic and neurological underpinnings (Hoogman et al., 2017). Recent findings from neuroimaging studies have shown both functional and structural differences in individuals with ADHD compared to those without the diagnosis (Charach, Yeung, Climans, & Lillie, 2011), including reduced volume in subcortical structures, frontal cortex, and cerebellum and delay in brain maturation and executive functions (Charach et al., 2011). Recent findings by Hoogman and colleagues (2017) have provided further evidence of structural differences across the lifespan in people with ADHD, including decreases in volume in several subcortical regions in children

under 15 years of age that are associated with emotional processing (i.e., amygdala and hypothalamus) (Hoogman et al., 2017). These findings lend support to the theory that a delay in brain maturation occurs during childhood and adolescence in children with ADHD (Wilens & Spencer, 2010).

Behavioral symptoms. All children experience moments of distraction across different settings (e.g., home, school, and leisure activities) such as failing to listen to their parent's instructions while captivated by a TV program. However, typical child behavior is differentiated from symptoms of ADHD by behavior that is developmentally inappropriate and unexpected in a given context (e.g., frequently blurting out answers before being called on in class). The inattentive symptoms described in the DSM-5 include: often fails to give close attention to details or makes careless mistakes in schoolwork, at work or during other activities; often has difficulty sustaining attention in tasks or play activities; often does not seem to listen when spoken to directly; often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace; often has difficulty organizing tasks and activities; often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort; often loses things necessary for tasks or activities; is often easily distracted by extraneous stimuli; and is often forgetful in daily activities (APA, 2013). In children with ADHD, these symptoms are often observable during tasks that require sustained cognitive effort, for example, completing homework or listening to classroom instruction.

The second cluster of symptoms is hyperactivity-impulsivity. Hyperactivity refers to motor movement that is excessive compared to children of the same age. DSM-5 symptoms of hyperactivity include: often fidgets with or taps hands or feet or squirms in seat; often leaves seat in situations when remaining seated is expected; often runs about or climbs in situations where it

is inappropriate; often unable to play or engage in leisure activities quietly; is often "on the go," acting as if "driven by a motor"; and often talks excessively (APA, 2013). Impulsivity can be described as developmentally inappropriate difficulty with self-monitoring or behavioral inhibition (e.g., repeatedly blurting out or verbally intruding when others are speaking). DSM-5 symptoms of impulsivity include: often blurts out an answer before a question has been completed; often has difficulty waiting his or her turn; and often interrupts or intrudes on others (APA, 2013). In addition to these criteria, several symptoms from either the inattentive or hyperactive-impulsive categories must have been present before the age of 12; symptoms must be present in two or more settings (e.g., at home, school or during leisure activities); and symptoms clearly interfere with, or cause impairment in social, academic or occupational functioning (APA, 2013). Furthermore, clinicians must determine that the symptoms are not better explained by a different physical or mental health disorder (APA, 2013).

Course. Historically, ADHD was believed to be a childhood disorder with symptoms disappearing by early adulthood. However, evidence from a number of longitudinal studies have established that ADHD is a lifelong disorder that can have serious, lasting negative implications on an individual's functioning across a broad number of domains including interpersonal relationships, employment, and increased risk of substance use (Fabiano, Schatz, Aloe, Chacko, & Chronis-Tuscano, 2015). For hyperactive/impulsive and combined presentations, longitudinal studies show an overall normative decline in severity between childhood and adolescence; however, inattentive symptoms are less likely to significantly decrease, with evidence suggesting that these symptoms remain relatively stable over time (Döpfner et al., 2014). Thus, while symptoms may decrease over time for some individuals, symptoms tend to endure across the lifespan for a majority of people.

Review of ADHD treatments

Psychostimulant Medication. Current treatment guidelines from the American Academy of Child and Adolescent Psychiatry (AACAP) recommend the use of a psychostimulant medication as a first line of treatment for ADHD (Pliszka et al., 2007). Psychostimulant medications, including commonly known brand name drugs such as Ritalin ®, Concerta ®, and Adderall ®, are some of the most frequently studied treatments for ADHD and a large body of evidence supports their use to address the core symptoms of ADHD in the short-term (e.g., Zachor, Roberts, Bart Hodgens, Isaacs, & Merrick, 2006). The two most commonly prescribed psychostimulants are methylphenidate (Ritalin ®) and amphetamine compounds (e.g., Adderall ®), both of which are hypothesized to increase dopamine and norepinephrine activity within the fronto-striatal circuitry of the brain (Faraone & Buitelaar, 2010; Spencer et al., 2013), thereby improving executive functioning (e.g., planning, organization, and behavioral control), however, this mechanism of action is not well understood (Rubia et al., 2014). Psychostimulants are frequently cited as the preferred first line of treatment in the psychiatric and medical literature due to their fast-acting nature (see Pliszka et al., 2007) and therapeutic benefits, including decreased hyperactivity/impulsivity and increased attention (Faraone & Buitelaar, 2010; Pliszka et al., 2007; Rubia et al., 2014).

Although psychostimulant drugs are associated with improvements in core symptoms of ADHD, there are a number of serious side effects associated with prolonged use that parents and prescribing physicians must consider when determining whether medication is appropriate and, for physicians, the optimal dosage for the presenting child (Zachor et al., 2006; The MTA Cooperative Group, 1999). One of the most significant side effects of taking psychostimulants and, arguably, the most concerning to parents is decreased appetite and subsequent weight loss,

which can negatively affect medication adherence over time (Zachor et al., 2006). Another side effect of concern is the potential for reduced or delayed growth in early childhood (Zachor et al., 2006), although evidence suggests that this side effect is not maintained over time and a majority of children reach a normal height by adolescence (Faraone & Buitelaar, 2010). Sleep disturbances, including insomnia and delayed sleep onset, are well documented side effects of psychostimulant medication use and have been the focus of a number of investigations (Stein, Weiss, & Hlavaty, 2012). A number of children taking medication report having significant difficulty both falling asleep and staying asleep. These difficulties negatively affect the overall amount of sleep children have and, on average, children taking stimulant medication sleep approximately 6.5 hours per night (Stein, Weiss, & Hlavaty, 2012), which is significantly less than 9 to 12 hours per night that is recommended for children ages 6 to 12 by the American Academy of Sleep Medicine (Paruthi et al., 2016). Additionally, children with ADHD have been found to have a longer sleep onset latency than typically developing children and children with the disorder may need to take sleep medications to address their symptoms (Efron, Lycett, & Sciberras, 2014). In sum, although psychostimulant medications have proven to be a fast, effective treatment for the primary symptoms of ADHD, there are a number of serious side effects that are important for parents and treating physicians to consider when determining the best course of treatment for an individual child.

Behavioral Treatment. Behavior management, a psychosocial treatment, has historically been used as secondary line of treatment to medication and/or in combination with medication to treat ADHD. Behavior management is a broad, umbrella term that consists of numerous interventions, such as behavioral parent training (BPT) and contingency management, that are based upon the principles of behaviorism (Fabiano et al., 2009). Behavioral interventions

are rooted in social, learning, and cognitive-behavioral theories and typically use the principles of operant conditioning and classical conditioning to effect behavioral change (Fabiano et al., 2009). A majority of behavioral interventions use operant methods wherein child behaviors are modified through the manipulation of antecedents (e.g., giving a command before a negative behavior occurs) and consequences (e.g., giving the child a timeout from positive reinforcement for a negative behavior); these processes increase positive behaviors and decrease problematic behaviors (e.g., noncompliance, such as refusing to follow instructions) (Fabiano et al., 2009). Behavioral interventions have been used to effectively treat child behavior problems across a range of disorders for over 50 years including ADHD, Autism Spectrum Disorders, and Conduct Disorders (Wolf, Risley, & Mees, 1963; O'Leary, Becker, Evans, & Saudargas, 1969; Patterson, 1974). However, despite the effectiveness of behavioral treatments, there continues to be significant disagreement between the fields of medicine and psychology about which type of treatment should be given first. Proponents of psychosocial behavioral treatments argue for the use of behavior management treatments as a first line of treatment, and note that medications should only be considered if psychosocial treatments do not improve symptoms, or as a complement to ongoing psychosocial treatment (APA Working Group on Psychoactive Medications for Children and Adolescents, 2006), whereas medical organizations typically recommend medication as the first-line treatment.

Classroom Interventions. A benefit of behavioral treatments is that they can be implemented in a number of settings (e.g., home, school, and recreational) by a variety of people (e.g., parents, teachers, and coaches) and contribute to building consistency and structure for children (Fabiano & Pelham, 2003; Martinussen, Tannock, & Chaban, 2011; Pelham & Fabiano, 2008). Additionally, behavioral treatments can be used to address a range of ADHD symptoms

including improving social skills, which are not targeted by medications (Pelham & Milich, 1984). Although children who take psychostimulant medications benefit from the overall reduction in their behavioral symptoms, they continue to experience social difficulties, such as interpersonal aggression and difficulty reading social cues (e.g., King et al., 2009; Pelham & Bender, 1982). A number of behavioral treatments have been specifically designed to work within the school environment; for example, Response Cost Technique (RCT) or Behavioral Classroom Management (BCM) is an intervention where children earn points for positive behaviors (e.g., raising their hands to ask a question) and lose points for negative behaviors (e.g., yelling, being off-task). This intervention works to increase the frequency of positive behaviors and decrease the frequency of negative child behaviors (Pelham & Fabiano, 2008). A number of studies have shown the positive effects of RCT, including increased on-task time in the classroom, higher rate of completion of academic tasks, and decreased disruptive, off-task behaviors (Witt & Elliot, 1982; Barkley et al., 2000; Gulley et al., 2003). Another classroom intervention is Classroom Lottery, a whole class intervention, where children earn points for following classroom rules (Curtis, Hamilton, Moore, & Pisecco, 2014). At random intervals, the classroom teacher makes note of the children who are following the rules; at the end of the day, children who followed the rules are asked to enter their name into a lottery. Children whose names are drawn get to choose the reward that they would like (e.g., a classroom job, extra recess time, or a toy). This intervention has been shown to increase on-task behavior and decrease off-task and/or disruptive behaviors in children with and without ADHD (Pelham, Wheeler, & Chronis, 1998). Finally, the Daily Report Card (DRC) is an individual intervention that identifies a small number of behavioral goals that the child attempts to meet each day and can be used in both the school and home settings; when the child reaches his or her goal at

school, the DRC is taken home and the child receives positive reinforcement in the form of a desired reward (Fabiano et al., 2010). The DRC has been found to be an efficacious treatment in improving academic outcomes including improved homework completion and accuracy, as well as decreased disruptive behavior (Merrill et al., 2017; Fabiano et al., 2010; DuPaul & Weyandt, 2006).

In recent years, findings from behavioral studies have shown significant positive effects of treatment across settings that are equal to and, in some cases, superior to the effects of medication (Pelham et al., 2016). A recently published study by Pelham and colleagues (2016) found that the sequence and intensity in which children received behavioral interventions and stimulant drug medications were significantly related to treatment outcomes. A key finding from this study is that children who received behavioral treatments first required less medication overall than children who received medication first. Moreover, some children in the study did not require medication at all when they had received the behavioral intervention first. In sum, behavioral treatments for ADHD address the core symptoms of ADHD (i.e., inattention, hyperactivity, and impulsivity) as well as increase positive behaviors and social skills.

Teacher Perceptions of ADHD and Acceptability of Treatments

In schools, general classroom teachers are most often responsible for supporting and managing the behavior of students with ADHD in their classrooms. However, many teachers report feeling ill-equipped to do so, and note that they would require more training in order to have confidence in their ability to effectively address ADHD related behaviors in the classroom (Weyandt et al., 2009; Jerome, 1994). Teacher factors, including beliefs, attitudes, knowledge, and perceptions of ADHD, are important variables to understand because they have the potential to affect the choice of classroom intervention and its efficacy (DuPaul & Eckert, 1997; Fabiano

et al., 2010). A number of studies have examined the aforementioned teacher factors and have found that they can have a significant effect on student outcomes including the academic success of children with ADHD, and the rate of disruptive classroom behaviors (Sherman, Rasmussen, & Baydala, 2008; Pisecco, Huzinec, & Curtis, 2001). An increasing number of teachers report feeling unprepared to manage the classroom behavior of children with emotional and behavioral problems such as ADHD (see Stormont et al., 2011; Njie, Shea, & Williams, 2017). Given that resources may be limited, and student to teacher ratios are increasing in many public school systems (Kauffman, 2007), it is more important than ever that teacher training programs (i.e. Bachelor of Education [BEd] programs) adequately prepare pre-service teachers for the reality of the classroom and the many complex students whose educational programming they will be responsible for (Stormont et al., 2011).

Teacher perceptions and knowledge of ADHD. Children with ADHD are more likely than their typically-developing peers to present with behavioral challenges in the classroom, including interrupting during instructional periods, verbal outbursts, and engaging in interpersonal conflicts with peers and teachers (Erhardt & Hinshaw, 1994; Ohan, Visser, Strain, & Allen, 2011). Given the level of classroom supervision and intervention required of teachers, it is perhaps unsurprising that a number of studies investigating teachers' perceptions of children with ADHD have found that teachers have an overall negative perception of children with ADHD (Weyandt et al., 2009). Other studies have found support for the effect of teachers' beliefs on their preferences for interventions (Curtis, Hamilton, Moore, & Pisecco, 2014), and have shown that attitudes and perceptions of ADHD relate to teachers' views of children with ADHD (Mulholland, Cumming, & Jung, 2015; Ohan, Visser, Strain, & Allen, 2011). Much of this research has used teachers with graduate degrees in education and/or familiarity with

behavioral disorders (e.g., special education or resource teachers), thus limiting the generalizability of these findings (Curtis, Hamilton, Moore, & Pisecco, 2014; Ohan et al., 2011).

Pre-service teachers' knowledge of ADHD. Although a number of investigations have focused on experienced teachers' perceptions of children with ADHD, and their knowledge of ADHD in general, a limited number of studies have examined pre-service teachers' views in these areas. As a follow-up to the study conducted by Jerome and Colleagues (1994), Bekle (2004) investigated practicing teachers' and pre-service teachers' knowledge of ADHD. Overall, results showed that practicing teachers had greater accuracy in their knowledge of ADHD than pre-service teachers; specifically, practicing teachers had more knowledge of the genetic heritability of ADHD as well as the behaviors associated with the disorder (Bekle, 2004). This finding is perhaps unsurprising, given that teachers already working in the field would have had more opportunity to become familiar with the behavioral symptoms of ADHD and associated academic difficulties through teaching children with the disorder, as well as by attending professional development training (Bekle, 2004). However, it is not possible to discern from this study to what degree pre-service training accounts for the knowledge both teachers and pre-service teachers had about ADHD.

Evidence-Based Practice

Over the past decade there has been an increasing interest in, and movement toward, the adoption of evidence-based practices (EBP) as a standard of practice across a number of disciplines including medicine and psychology. The term EBP originates from the field of medicine and outlines the practice of evidence-based medicine as "…the integration of best research evidence with clinical expertise and patient values" (Sackett, 2000), p.147). In 2005, the APA assembled a presidential task force with the objective of investigating evidence-based

practices in psychology (EBPP) and to create a definition of EBP for the field of psychology. A definition of EBPP was outlined as follows: "The purpose of EBPP is to promote effective psychological practice and enhance public health by applying empirically supported principles of psychological assessment, case formulation, therapeutic relationship, and intervention." (APA Presidential Task Force on Evidence-Based Practice & American Psychological Association, 2006). Similarly, in 2011, the CPA formed a presidential task force to outline a comprehensive definition of EBP, and outline evidence-based psychological treatments for psychologists in the practice. The CPA defined EBP as "…the conscientious, explicit, and judicious use of the best available research evidence to inform each stage of clinical decision-making and service delivery." (Dozois et al., 2014, p.155). The definitions from both the APA and CPA highlight the need for psychologists to consider multiple types of evidence when determining the best course of intervention, or therapeutic approach, for their client needs. Additionally, EBPP requires that psychologists apply their clinical expertise and judgement to address the challenges and needs of their clients. Moreover, these comprehensive definitions recognize that the concept of EBPP is ever-changing; EBPP must not remain stagnant, rather, psychologists must continually seek education and training, as well as reflect upon how individual biases and cultural differences have the potential to affect their treatment of clients (APA Presidential Task Force on Evidence-Based Practice & American Psychological Association, 2006).

Evidence-based practice in education. Over the past decade, discussion around the application of EBP in the field of education has emerged, with particular focus on studies investigating teachers' training in, use of, and attitudes towards EBP (Odom et al., 2005). General education teachers and special education teachers' knowledge, attitudes, and use of EBP have been the focus of a number of studies (see Oliver & Reschly, 2010; Stormont, Reinke, &

Herman, 2011; Martinussen, Tannock, & Chaban, 2011). For example, a study conducted by Gable and colleagues (2012) investigated teachers' attitudes towards academic and non-academic interventions for children with emotional difficulties (ED). Teachers and special education teachers were surveyed and asked to rate their preference for, and preparedness to implement, 20 different evidence-based interventions (e.g., contingency management, functional behavior analysis, and social skills instruction). Findings showed that a majority of both general education and special education teachers reported having a positive attitude toward a majority of the evidence-based interventions, however, they also reported not feeling adequately prepared to implement these interventions, such as teaching social skills and addressing the function of negative child behaviors through functional behavior analysis (FBA). The authors noted that this finding was concerning given that interventions such as classroom-wide contingency management are relatively simple to implement and require very few resources (Gable, Tonelson, Sheth, Wilson, & Park, 2012). These findings are consistent with a number of other investigations into teachers' preparedness to implement EBP in the classroom (see Oliver & Reschly, 2010; Stormont, Reinke, & Herman, 2011; Martinussen, Tannock, & Chaban, 2011). Overall, these findings suggest a gap between research and practice; while a majority of teachers report that they are supportive of efforts to use EBP in the classroom they do not currently believe they have the skills to implement these practices (Gable, Tonelson, Sheth, Wilson, & Park, 2012; Stormont, Reinke, & Herman, 2011).

Today, there is significant evidence that the fields of psychology and medicine are continuing to make efforts towards improving the use of EBP in their respective fields (see Pliszka et al., 2007; APA Presidential Task Force on Evidence-Based Practice & American Psychological Association, 2006). However, since a majority of children with ADHD attend

school in the general classroom, much of their treatment is delivered in the classroom setting. Given this, it's important to understand what teachers know about EBP for ADHD to ensure that the treatment children receive is consistent across settings in order to maximize its benefit. Moreover, it is important to gain insight into pre-service teachers' knowledge about ADHD and in-school interventions so that we can understand their knowledge, attitudes, and perceptions as they begin their careers. With this in mind, the following studies examined pre-service teachers' acceptance of ADHD interventions and, more broadly, their understanding of, attitude toward, and perceived skill with using EBP.

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CHAPTER TWO

Pre-Service Teachers' Perceptions and Acceptance of ADHD Interventions in School-Aged Children

Behavioral Interventions for ADHD

Over the past decade there has been much disagreement in the literature about the optimal first line treatment for ADHD, specifically, whether psychostimulant medication or behavioral treatment should be used to manage the symptoms of the disorder. The American Academy of Child and Adolescent Psychiatry recommends the use of psychostimulant medications (AACAP Work Group on Quality Issues; 2007), whereas the American Psychological Association (APA) Working Group on Psychoactive Medications for Children and Adolescents (2006) recommends behavioral treatments, which may be augmented with medications if symptoms are not addressed by behavioral treatment alone. Behavior management is an evidence-based treatment supported by a substantial body of empirical research as an effective treatment for ADHD (e.g., Fabiano, Schatz, Aloe, Chacko, & Chronis-Tuscano, 2015; Fabiano et al., 2009). Research has shown that behavior management is most effective when implemented consistently across a child's environment (i.e., home, school, and recreational activities) (Evans, Owens & Bunford, 2014; Fabiano et al., 2009).

The effectiveness of behavior management as a treatment for ADHD was highlighted in a recent study conducted by Pelham and colleagues (2016) in which the authors investigated the effects of treatment modality (i.e., psychostimulant medication or behavioral treatment) and the order in which children receive treatment on their overall treatment outcomes (i.e. objective observation of classroom behavior and parent/teacher ratings of child behavior). Findings indicated that the most effective treatment outcome was in the group that received behavioral

treatment first and medication as a secondary treatment if the behavioral treatment alone did not sufficiently reduce symptoms (Pelham et al., 2016). In contrast, the least effective treatment outcome was in the group that began treatment with medication and added behavioral treatment when medication was insufficient (Pelham et al., 2016). Importantly, these findings also showed that some children with ADHD may not require medication treatment, as some participants in the study exhibited a significant reduction in symptoms when provided with behavioral treatment alone (Pelham et al., 2016). Although these findings conflict with current treatment recommendations by the AACAP Work Group on Quality Issues (2007), they underscore the importance of behavior management as a first line treatment for ADHD. One of the settings in which behavior management of ADHD symptoms is important is the school.

Teacher Factors: Perceptions, Knowledge, and Beliefs about ADHD

Investigators in this field have shown that teacher factors, such as perceptions of ADHD, affect the choice of classroom intervention and its efficacy (e.g., DuPaul & Eckert, 1997; Fabiano et al., 2010). Pisecco, Huzinec, and Curtis (2001) found that when asked to rate the acceptability of behavioral interventions and medication, teachers rated Daily Report Cards (DRCs) as the most acceptable classroom intervention for the management of ADHD. Interestingly, there was a significant effect of child sex on teachers' ratings of treatment acceptability, such that teachers were significantly less likely to endorse the use of psychostimulant medication for female students with ADHD symptoms (Pisecco et al., 2001). This finding could have serious implications for classroom management of ADHD, particularly if teachers are less likely to refer female students who exhibit ADHD-like symptoms (Pisecco et al., 2001; Sherman, Rasmussen, & Baydala, 2008). Other studies have found support for the effect of teachers' beliefs on their preferences for interventions. For example, Curtis and

colleagues (2014) asked teachers to rate their preference for ADHD interventions (i.e., medication versus behavioral interventions) as well as their pupil control orientation (i.e., custodial or humanistic) and found that teachers' preference for classroom management was significantly related to a custodial orientation. Teachers who preferred classroom management techniques held more custodial beliefs, such that the classroom environment should be ordered and consist of clear, enforced rules. In a recent Canadian study, teachers' beliefs about ADHD were found to be related to their use of evidence-based behavior management interventions; that is, teachers who held more negative beliefs about ADHD were significantly less likely to use evidence-based behavior management in the classroom (Blotnicky-Gallant, Martin, McGonnell, & Corkum, 2015). These findings are consistent with a number of previous studies that have shown that attitudes and perceptions of ADHD relate to teachers' views of children with ADHD which, in turn, have the potential to influence their classroom practices (e.g., Mulholland, Cumming, & Jung, 2015; Ohan, Visser, Strain, & Allen, 2011).

Teachers' knowledge about the etiology and treatment of ADHD has also been the focus of a number of studies. For example, a study conducted by Jerome and colleagues (1994) highlighted teachers' misconceptions about the treatment of ADHD, specifically, the dietary treatment of ADHD; nearly half of teachers reported believing that ADHD was caused by consuming sugar and other additives. Furthermore, a majority reported that diet was an important factor in the treatment of ADHD. A follow-up study by Bekle (2004), conducted with a sample of Australian teachers, reported similar findings; a significant majority of teachers believed that ADHD was related to sugar consumption and that diet was a key component of the treatment of ADHD.

Although these findings provide insight about teacher factors that affect choice of classroom interventions, much of this research has used teachers with graduate degrees in education and/or familiarity with behavioral disorders (e.g., special education or resource teachers), thus limiting the generalizability of these findings (e.g., Curtis et al., 2014; Ohan et al., 2011). Literature examining pre-service teachers' perceptions of ADHD is limited to a small body of research conducted more than a decade ago, making it difficult to draw conclusions about current teachers' perceptions prior to beginning their careers.

Pre-Service Teacher Training

Whereas previous studies have examined the effect of in-service training (e.g., professional development workshops) on teachers' use of behavior management (e.g., Martinussen, Tannock, & Chaben, 2011) as well as teachers' knowledge of ADHD (e.g., Weyandt, Fulton, Schepman, Verdi, & Wilson, 2009), there remains a paucity of research examining how factors such as teacher preparation (e.g., Bachelor of Education [BEd] programs), and pre-service (i.e., prior to beginning full-time work as a teacher) teachers' perceptions of ADHD relate to their use of behavioral interventions in school. In a seminal paper by Jerome et al. (1994), American and Canadian teachers and pre-service teachers were surveyed about their knowledge and attitudes regarding ADHD. Importantly, a majority of teachers and pre-service teachers reported having no opportunity to learn about ADHD during their undergraduate teacher training (Jerome et al., 1994). When teachers were asked if they would like to receive in-service training in ADHD, if given the opportunity, virtually all teachers responded positively. Investigators in this field posit that these findings highlight the larger issue of inadequate pre-service training in the area of mental health and behavior management (Martinussen et al., 2011; Sherman et al., 2008; Bekle, 2004) and caution that teachers may enter

the profession with inadequate knowledge about how best to support students with behavioral difficulties in their classroom.

A small number of studies have investigated the knowledge of special education teachers compared to general education teachers (e.g., Jones & Chronis-Tuscano, 2008; Weyandt et al., 2009) and found no significant difference in their knowledge of ADHD. However, Jones & Chronis-Tuscano (2008) found a significant difference between special education teacher and general education teacher knowledge of ADHD and their reported use of behavior management in the classroom, such that special education teachers reported both greater knowledge and use of behavior management techniques in the classroom. Using a sample of Canadian teachers, Martinussen and colleagues (2011) found that more than half of special education and a majority of general education teachers reported having no or limited in-service training about ADHD and behavior management. Furthermore, only 15% of general education teachers reported use of individual behavior management interventions such as daily report cards. The authors posit that this is likely related to general education teachers' overall lower rate of extensive training in ADHD. However, of the general education teachers who reported receiving moderate to comprehensive training in ADHD, they also reported significantly more frequent use of behavior management techniques than general education teachers with limited ADHD training (Martinussen, Tannock, & Chaban, 2011). These findings are problematic, considering the prevalence of ADHD and the negative outcomes associated with the disorder, including increased risk of delinquency, school drop-out, and substance abuse (Barkley, 2006; Charach et al., 2011). If pre-service teachers' knowledge and perceptions of evidence-based practice and behavioral interventions were better understood, it could help to improve curricula in teacher training programs, decrease the training-practice gap that exists in education (Broekkamp & van

Hout-Wolters, 2007), and increase the use of evidence-based classroom interventions for children with ADHD.

Current Study

Supporting student mental health has become an increasing priority in schools. However, teachers must be willing to use evidence-based practices in order to maximize the efficacy of school-based interventions (Weyandt et al., 2009). Similarly, it is incumbent upon researchers to determine the feasibility and ecological validity of interventions outside of controlled, experimental settings and when applied in everyday contexts (i.e., the regular classroom). In this study, we attempt to extend previous findings of teachers' acceptability of ADHD interventions (i.e., Pisecco et al., 2010) in a sample of pre-service teachers. Specifically, the study investigated pre-service teachers' preference for classroom-based interventions and medication treatments for ADHD. Finally, the training-practice gap and the relation between teachers' level of education and their self-efficacy was examined via closed and open-ended questionnaires. Based on previous findings, it was expected that pre-service teachers would have a preference for the daily report card over classroom lottery, response cost technique, and medication.

Method

Participants

Participants were 54 students enrolled in a two-year post-bachelor Bachelor of Education (BEd) program in Eastern Canada (first year n = 31, second year n = 23). Inclusion criteria required participants to be sufficiently fluent in English to complete questionnaire measures. The majority of participants were in the 20-25-year-old range (81.5%), Caucasian (88.9%), and female (81.5%). Background information questionnaires indicated that a majority of pre-service teachers received ADHD training as a component of their teacher training either briefly, as a

separate topic (43.6%) or briefly, in passing (35.2%). Additionally, 63% of the sample reported having a close friend or family member with an ADHD diagnosis.

Measures

Participant Demographics. Participants completed an adaptation of the Background Information Questionnaire (BIQ; Curtis et al., 2014). This measure was used to collect basic demographic information about participants including age range, level of education, ethnicity, sex, and knowledge and perceptions of ADHD (e.g., 'Do you agree that ADHD is a legitimate educational problem?').

ADHD Knowledge Questionnaire (Jerome, Gordon, & Hustler, 1994). This questionnaire consists of 20 true or false items that measure participants' beliefs about the origin, characteristics, and treatment of ADHD. The questionnaire items are based on empirically supported findings from the literature, as well as widely held myths about ADHD in the general population (Pisecco et al., 2010). This measure has been used in previous studies (e.g., Curtis, et al. 2014) to assess participants' beliefs about ADHD for potential moderation effects on participants' treatment acceptability ratings.

Behavior Intervention Rating Scale (BIRS; Elliott & Von Brock Treuting, 1991). Participants' perceptions of the acceptability of ADHD treatments were assessed using the 24-item Behavior Intervention Rating Scale. Participants rated the acceptability of four commonly used classroom interventions for ADHD (i.e., Daily Report Card, Response Cost Technique, Classroom Lottery, and medication) on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). Additionally, participants were given the option to provide written qualitative feedback on the strengths and weaknesses of each treatment. The measure consists of three distinct factors: (1) acceptability (i.e., the intervention is appropriate for the behavior problem; 15 items); (2) effectiveness (i.e., the intervention reduces symptoms; 7 items); and (3) timeliness of effect (i.e.,

the speed of behavior change; 2 items). These three factors account for 76.3% of the total variance on the BIRS. Items on each subscale are summed to create a subscale total score. This measure has demonstrated good psychometric properties (see Curtis et al., 2014) including high internal consistency across factors (acceptability α = .97; effectiveness α = .92; timeliness α = .87).

Pupil Control Ideology Form (PCI; Willower & Jones, 1963). This measure was used to assess participants' pupil control orientation and perceptions about classroom management. The Pupil Control Ideology Form measures orientation on a spectrum ranging from humanistic to custodial; humanistic orientations prioritize students learning through experience and emphasize cooperation in the classroom (Gordon et al., 2007). A custodial orientation is characterized by strict adherence to rules, and authoritarian control of the classroom environment. The questionnaire consists of 20 items, rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with higher scores indicating a custodial orientation. This measure has good psychometric properties including excellent split-half reliability (.91) and has good internal consistency (α = .75) (see Curtis et al., 2014).

Teacher Efficacy Scale (TES; Gibson & Dembo, 1984). The Teacher Efficacy Scale is a measure of perceived teaching self-efficacy and contains 30 items, each rated on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). The measure results in two distinct dimensions: Personal Teaching Efficacy indicates the extent to which individuals believe their teaching skills have the ability to produce positive student results; General Teaching Efficacy reflects the perception that teachers are individuals who can create change in children's lives, although change might be restricted by external variables such as the home setting. The measure

has good psychometric properties including convergent validity (see Curtis et al., 2014) and good internal consistency (α's .75 to .79).

Vignettes (Curtis et al., 2014). The vignettes are based on DSM-IV (APA, 2000) criteria for ADHD and depict the behavior of a boy named Jonathan, who displays symptoms consistent with each of the three presentations of ADHD (i.e., predominately inattentive subtype, predominately hyperactive-impulsive subtype or combined subtype). However, the term ADHD is not explicitly mentioned in any of the three vignettes given to participants. The decision to use vignettes describing the behavior of a boy with ADHD was made in part due to practical constraints. Moreover, the disorder is most prevalent in male children (APA, 2013) and is thus representative of a child a teacher is most likely to encounter. The vignettes were used in a previous study (Curtis et al., 2014) and were used with the permission of the author.

Procedure

Students in the first and second year of a post-bachelor's BEd program were invited to complete the study. Once informed consent was obtained, participants were randomly assigned to read one of three vignettes describing the behavioral symptoms of a boy with ADHD. After reading the vignette, participants read four different descriptions of classroom management interventions that could be applied to the hypothetical child. These descriptions were used in a previous study (Curtis et al., 2014) and were provided by the author:

Daily Report Card (DRC). The use of a DRC is a possible intervention and involves the parents and teachers working together to identify approximately 3 to 5 problem behaviors. A report card is then developed with daily goals being set in a positive manner for the child. The child then takes the report card home to his or her parents and the child earns rewards for meeting specific daily goals.

Response Cost Technique (RCT). The use of the RCT is a possible intervention where the child would earn points for exhibiting specific positive behaviors (e.g., completing tasks) and would lose points for exhibiting negative behaviors (e.g., interrupting the teacher). At a predetermined time, the child could redeem his or her points for rewards.

Classroom Lottery. A classroom lottery is a possible intervention that is a group intervention in which the children can earn classroom rewards based upon their behaviors. The teacher establishes a brief list of class rules and posts them. The children are told that they will earn class jobs (e.g., line monitor, office messenger, paper- hand-outer) according to their ability to follow class rules. At unannounced times the teacher checks to see who is following the rules. The names of all children who are following the rules are written down. At the end of the day the children who were following the rules at a designated criterion level (e.g., 4 out of 5 scans) put their names on a piece of paper which is then put into a lottery bin. As the names are drawn the children choose the classroom job that he or she wants for the next day.

Stimulant Medication (e.g., Ritalin ®). Ritalin ® is a possible intervention and is usually taken twice a day. Ritalin ® is a medication that is intended to reduce the child's behavioral problems.

Following this, participants rated the acceptability of interventions on the BIRS. Upon completion of the BIRS, participants completed a package of questionnaires, with the order of measures counterbalanced across participants. Following completion of the study, participants were entered into a draw to win one of three $50 gift cards to a local bookstore.

Results

Descriptive Analyses

Descriptive statistics for pre-service teacher ratings of interventions are shown in Table 1.1. Correlations among variables are shown in Tables 1.2 to 1.5. Descriptive analyses for potential covariates were examined. No significant correlations were found. For all multivariate models, we confirmed normality, linearity, homogeneity of variance, and the absence of influential outliers. In contrast to previous studies of practicing teachers (i.e. Pisecco et al., 2001; Curtis et al., 2014), the current sample of pre-service teachers' knowledge of ADHD, teaching orientation, and self-efficacy were not significantly correlated with treatment outcome variables. Additionally, as a part of the study, participants were given the option of providing qualitative comments regarding each of the interventions. These comments are included below with the goal of providing context and participant voice to better situate the quantitative findings.

Testing a Multivariate Model

Anticipating a multivariate model, we calculated correlations for the three intervention variables (i.e. acceptability, effectiveness, and timeliness) within each intervention (see Tables 1.2 to 1.5). Pearson correlations ranged from moderate to large (*r*'s from .39 to .88), thus confirming shared variance. A 4 X 3 mixed multivariate analysis of variance (MANOVA) was conducted to examine differences in pre-service teachers' ratings of intervention acceptability, effectiveness, and timeliness. As expected, the overall model was significant $F(11, 43) = 308.00$, $p < .05$, $\eta_p^2 = .99$. We examined post-hoc pairwise comparisons to determine which interventions significantly differed on acceptability, effectiveness, and timeliness. Findings indicated that pre-service teachers considered DRCs to be the most acceptable ($M = 79.28$, $SD = 11.7$), effective ($M = 31.85$, $SD = 5.80$), and timely ($M = 9.04$, $SD = 1.89$) of the four

interventions when compared to Response Cost Technique (RCT), Classroom Lottery (CL), and medication (see Table 1.6 for pairwise comparisons). The largest mean difference observed was between DRCs and medication; pre-service teachers rated DRCs as significantly more acceptable than medication with a mean pairwise difference of $M = 35.08$, $p < 0.05$, Cohen's $d = 2.22$. Results indicated that medication was considered to be the least acceptable of all the interventions; both RCT and CL were each rated as significantly more acceptable than medication. Additionally, participants rated DRCs as both the most effective and timely intervention compared to RCT, CL, and medication. The largest mean difference was between DRCs and medication for effectiveness, with a mean pairwise difference of $M = 7.87$, $p < 0.05$, Cohen's $d = 1.10$, and between DRCs and CL on timeliness with a mean pairwise difference of $M = 1.66$, p. < 0.05, Cohen's $d = 0.70$.

A second, exploratory between subjects MANOVA was conducted to examine the effect of year of study on participant ratings of interventions. There was no significant rating x year of study interaction, however, the overall model remained significant.

Qualitative Data

A review of the qualitative data collected indicated two consistent themes among participant comments; first, half of the participants who provided comments on the DRC (20 of 40) noted that a significant strength of the DRC is that it increases communication between home and school. Secondly, a majority of participants (41 of 54) noted serious concerns regarding the use of medication in the treatment of ADHD; comments about medication ranged from concerns over the negative side effects of medication (e.g., appetite suppression), to it being used a tool to subdue or quiet children with ADHD. Additionally, a number of comments demonstrated a false belief regarding the potential side effects of medications such as: it results in alterations in

personality, it causes depression, there is a risk of physical dependency, and it may impede normal brain functioning. Comments such as these are concerning as they are not reflective of what is currently known about the impact of medication on functioning in children with ADHD. In sum, participants' comments provide additional insightful data on participants' perceptions of ADHD interventions, particularly, regarding their negative perceptions about ADHD medications.

Discussion

The present study investigated pre-service teachers' preferences for ADHD treatments (i.e., in-classroom behavioral interventions and medication). In line with findings from previous studies of teachers' preference for ADHD interventions (e.g., Pisecco et al., 2001; Curtis et al., 2014), it was expected that pre-service teachers would have a preference for the daily report card over classroom lottery, response cost technique, and medication.

Results from this study replicate previous findings in a sample of pre-service teachers; the DRC was rated as the most acceptable, effective, and swift to produce behavioral change than the other three interventions presented. Of particular interest was the clear preference for the DRC over other evidence-based interventions, particularly medication. Ratings for the acceptability of medication were consistently and significantly lower than those of all three behavioral interventions, which is interesting given that both behavioral and pharmacological treatments have long been used as part of a typical course of treatment for ADHD, and there is a considerable body of empirical evidence supporting their use (e.g., MTA Cooperative Group, 1999; Pelham et al., 2016). Moreover, the qualitative data collected indicated that medication was overwhelmingly the least preferred intervention, and most participants (41 of 54) had a negative perception of medication. A number of the negative perceptions of medication were

related to the perceived negative side effects associated with medication, as well as concerns over long term dependency. Overall, participants indicated that medication should only be used after all other treatment options have been exhausted. These results diverge from previous findings of teachers' intervention preferences, which found that teachers held more favourable perceptions of medication as a treatment for ADHD (e.g., Pisecco et al., 2001), specifically, the perception that medication results in a quick decrease in symptoms. This finding in particular, may differ from previous studies due to the overall experience level of the sample; this sample of pre-service teachers might not yet have had exposure to children with ADHD both on and off medication, thus, these findings could arguably be related to their lack of exposure to the effects of medication on symptoms. However, these findings also raise questions about the potential implications when teachers hold less favourable views of medication as a treatment for ADHD prior to beginning their careers. Given the prevalence of medication in the treatment of ADHD, and the misunderstanding associated with the use of pharmacological treatments for mental health disorders (see Charach & Fernandez, 2013), these findings are somewhat concerning. On the other hand, pre-service teachers' strong preference for the DRC is encouraging in light of recent findings that behavioral interventions can be as effective as medication in reducing ADHD symptoms (Pelham et al., 2016). It is possible that DRC may have been the preferred intervention for pre-service teachers due to its perceived ease of use, whereas, classroom-wide interventions such as Classroom Lottery could be perceived as requiring more time, effort, and resources to implement on a daily basis. Lastly, findings from this study differed from previous research interventions (e.g., Curtis et al., 2014) in terms of pre-service teachers' knowledge of ADHD, teaching orientation, and self-efficacy which were found to be unrelated to their ratings of ADHD. This could be due to small sample size, and therefore reduced power to detect

significance, or could be the result of a less experienced sample. In sum, the findings from this study are important in establishing a baseline of the perceptions that pre-service teachers hold upon entry into the field.

Implications

The findings from this study are important with respect to understanding teachers' behavior management preferences upon entry into the profession, particularly if those beliefs and preferences are not consistent with current treatment guidelines. The results of the current study indicate that pre-service teachers overwhelmingly preferred behavioral interventions for ADHD, with a specific preference for the DRC. This finding provides further evidence supporting the use of evidence-based treatments in schools. One of the key implications of this study for teacher training is that a majority of pre-service teachers indicated that they would like to receive more training on ADHD and reported having received only brief training during their teacher training program. If teachers and pre-service teachers find behavioral interventions acceptable, then more efforts must be devoted to training teachers how to implement them. One recommendation is to increase instruction about evidence-based practices at the BEd level, specifically, what defines evidence-based and how to determine whether a practice meets evidence-based standards. Current research findings suggest that teachers' overall rate of implementing evidence-based practices are low (e.g., Kretlow & Helf, 2013; Gable, Tonelson, Sheth, Wilson, & Park, 2012), despite increasing calls to close the training-practice gap (Jones, 2009). Furthermore, teachers' self-rated confidence at both selecting and implementing evidence-based general classroom management interventions are low (Kretlow & Helf, 2013). Research comparing general education and special education teachers' use of evidence-based practice for children with emotional and behavioral difficulties (Gable et al., 2012; Stormont, Reinke, &

Herman, 2011) has highlighted a common absence of training and preparation; a majority of teachers reported lacking confidence in both selecting and implementing evidence-based practices in the classroom. These findings point to gaps in teacher training across general and special education, and stress the importance of meeting teachers needs for further support and training in evidence-based practices.

For teachers already in practice at the school level, they can access consultation and training from school psychologists, who are highly trained in the delivery of interventions (Sheridan & Gutkin, 2000) and who can guide teachers in implementing effective interventions at an individual, and whole classroom level. It also is important to raise awareness of school psychologists among pre-service teachers prior to beginning work, as they are typically the most highly qualified mental health professionals working in school systems (Sheridan & Gutkin, 2000) and they are able to support teachers in addressing the behavioral and mental health needs of students.

Despite pre-service teachers' preference for the DRC, it will be difficult for them to implement any behavioral interventions with fidelity when pre-service teachers themselves report feeling that they do not have adequate understanding of ADHD and thus have, arguably, less knowledge about the principles of behavior in general. In future, it will be important for teacher training programs to increase pre-service teachers' knowledge and self-efficacy, not only of ADHD, but of behavioral principles which will benefit their ability to effectively work with all children.

Limitations

Although this study provides important insight into pre-service teachers' understanding of behavioral management of ADHD, it is important to note its limitations. First, participants

read vignettes depicting the behavior of a male child and, as such, findings cannot be generalized to all children with ADHD. However, ADHD is more frequently diagnosed in males than females, meaning that teachers are more likely to encounter the behavior depicted in their male students. Second, vignettes were used as an analog for real child behavior; participants were given hypothetical situations in which to evaluate the interventions, thus limiting the generalizability of our findings. Nonetheless, vignettes provide a way of gathering baseline data in a controlled way. Third, it is possible that pre-service teachers have had less exposure to children before and after taking medication, and thus may be less likely to see its potential effectiveness in managing some of the behavioral symptoms of ADHD. Finally, participants were asked to rate only four possible interventions for the management of ADHD. It is possible that if participants were asked, for instance, to compare behavioral interventions to non-evidence based interventions that their preferences would differ.

Future Research

Future studies could examine teachers' and pre-service teachers' preferences for behavioral interventions for ADHD compared to non-evidence-based interventions to further investigate the acceptability and feasibility of classroom interventions for ADHD. It is important to elucidate whether pre-service teachers' preference for behavioral interventions in this study and previous research (i.e., Pisecco, Huzinec, & Curtis, 2001; Curtis, Hamilton, Moore, & Pisecco, 2014) remain when presented with other, non-evidence-based practices. In light of ADHD treatment guidelines (see AACAP Work Group on Quality Issues, 2007 and APA Working Group on Psychoactive Medications for Children and Adolescents, 2006) it will be crucial to investigate the efficacy and fidelity of ADHD treatments such as the DRC when applied outside of controlled empirical settings and in practice. Future work in this area will help

to ensure that children with ADHD are provided with the best standard of care within the school setting.

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Table 1.1

Means and Standard Deviations on the BIRS by Intervention. N = 54

ADHD Intervention Variables	*M*	*SD*	Min Score	Max Score
Acceptability				
DRC	79.28	11.75	32	90
RCT	68.85	19.34	15	90
MED	43.72	16.88	15	85
CL	62.00	19.82	15	90
Effectiveness				
DRC	31.85	5.80	11	42
RCT	28.48	7.98	7	42
MED	23.67	8.83	7	39
CL	25.19	8.36	7	42
Timeliness				
DRC	9.04	1.89	5	12
RCT	8.44	2.59	2	12
MED	7.47	2.78	2	12
CL	7.41	2.70	2	12

Note. DRC = Daily Report Card, RCT = Response Cost Technique, MED = Medication, CL = Classroom Lottery.

Table 1.2

Correlations for DRC by subscale. N = 54

		Timeliness	Effectiveness
Acceptability	*r*	0.419	0.394
	p	$\leq$ 0.01	$\leq$ 0.01
Timeliness	*r*	1	0.645
	p		$\leq$ 0.01
Effectiveness	*r*		1
	p		

Table 1.3

Correlations for RCT by subscale. N = 54

		Timeliness	Effectiveness
Acceptability	*r*	0.754	0.711
	p	$\leq$ 0.01	$\leq$ 0.01
Timeliness	*r*	1	0.879
	p		$\leq$ 0.01
Effectiveness	*r*		1
	p		

Table 1.4

Correlations for Medication by subscale. N = 54

		Timeliness	Effectiveness
Acceptability	*r*	0.623	0.682
	p	$\leq$ 0.01	$\leq$ 0.01
Timeliness	*r*	1	0.795
	p		$\leq$ 0.01
Effectiveness	*r*		1
	p		

Table 1.5

Correlations for CL by subscale. N = 54

		Timeliness	Effectiveness
Acceptability	*r*	0.767	0.800
	p	$\leq$ 0.01	$\leq$ 0.01
Timeliness	*r*	1	0.840
	p		$\leq$ 0.01
Effectiveness	*r*		1
	p		

Table 1.6

Pairwise Comparisons for Acceptability by Intervention. N = 54

ADHD Intervention Variables	Mean Difference	*p*	Cohen's *d*
Acceptability			
DRC – RCT	10.595	≤ 0.01	0.65
DRC – MED	35.080	≤ 0.01	2.22
DRC – CL	17.461	≤ 0.01	1.06
RCT – MED	24.485	≤ 0.01	1.38
RCT – CL	6.865	0.07	0.04
MED – CL	-17.619	≤ 0.01	0.99
Effectiveness			
DRC – RCT	3.384	≤ 0.01	0.48
DRC – MED	7.870	≤ 0.01	1.10
DRC – CL	6.760	≤ 0.01	1.20
RCT – MED	4.485	≤ 0.01	0.57
RCT – CL	3.376	≤ 0.01	0.40
MED – CL	-1.109	0.499	0.18
Timeliness			
DRC – RCT	0.572	0.140	0.26
DRC – MED	1.515	≤ 0.01	0.66
DRC – CL	1.655	≤ 0.01	0.70
RCT – MED	0.943	0.08	0.36
RCT – CL	1.083	0.02	0.39
MED – CL	0.140	0.80	0.02

CHAPTER THREE

Pre-service teachers' evidence-based practice (EBP) related knowledge, attitudes, and practices

Evidence-Based Practice in Education

In fields such as psychology and medicine, the conversation about evidence-based practice (EBP) has progressed to the point of setting comprehensive ethical and policy standards for their respective fields (APA Presidential Task Force on Evidence-Based Practice & American Psychological Association, 2006; Dozois et al., 2014; Pliszka, 2007); however, not as much progress has been made in the field of education. In recent years, discussion about the need to increase the use of EBP at the school-wide and individual classroom levels have continued to gain attention. There have been increasing calls to close the gap between research and practice; studies have shown that a gap exists between educational research and practice both at the policy level and within the school setting (Broekkamp & van Hout-Wolters, 2007; Odom et al., 2005). Although there have been increasing calls within the educational research field to close the gap between research and practice, as well as proposed guidelines for practice in areas such as special education (see Cook, Tankersley, & Landrum, 2009), there continues to be large variability in the way that EBP is applied in education settings, if it is used at all (Simpson, Peterson, & Smith, 2011; Kretlow & Helf, 2013). Furthermore, others have argued that despite the increasing awareness of EBP in education there has been an overall movement away from using EBP to inform instructional practices (Kauffman, 2007).

Teachers' attitudes, knowledge, and use of EBP

Attitudes about EBP. A number of studies have investigated teachers' perceptions and use of EBP and have found that, overall, teachers support the idea of using EBP to inform their

instructional practices and classroom management (Gable, Tonelson, Sheth, Wilson, & Park, 2012; Stormont, Reinke, & Herman, 2011). However, findings also indicate that teachers may be reluctant to use EBP due perceived barriers such as locating and interpreting research (Kauffman, 2007), and a lack of training in implementing EBP such as classroom management (Stormont, Reinke, & Herman, 2011). Additionally, teachers may view researchers as out of touch with the everyday needs and challenges of the classroom environment and therefore see research findings as less important than personal experience (Gore & Gitlin, 2004).

Barriers to EBP. A study conducted by Brown & Zhang (2016) surveyed 696 teachers in the United Kingdom on their beliefs about, and use of, EBP as well as perceived barriers to practice. Findings indicated that a majority of teachers supported the idea of using of EBP, however, they indicated that there were barriers to using EBP primarily at the at the school level (Brown & Zhang, 2016). Specifically, teachers reported that their own skill level was not the barrier to practice, rather, it was the overall lack of support and acceptance of EBP at the broader school level that made it difficult to implement (Brown & Zhang, 2016). Other studies have shown additional barriers to EBP; many teachers do not receive training in how to locate, interpret, and apply research findings as a component of their pre-service training, nor is it a requirement of entering the teaching profession or maintaining certification (Broekkamp & van Hout-Wolters, 2007). Given this, it is understandably challenging for teachers to determine which practices or interventions are meritorious and worth pursuing.

Beliefs about EBP: Personal experience over evidence. Individual differences exist in how teachers evaluate the value and importance of empirical evidence; studies have shown that teachers may view their own individual knowledge, personal experience, and creativity as more relevant to implementing programming or using various teaching strategies than adhering to

empirical research findings, which may be perceived as clinical, and less applicable to their own classrooms (Broekkamp & van Hout-Wolters, 2007; Gore & Gitlin, 2004). In contrast, other professions such as psychology, require practitioners to maintain continuing competency with research that is pertinent to their area of practice as an ethical standard, and place significantly less emphasis on personal experiences or anecdotal evidence to inform them (APA Presidential Task Force on Evidence-Based Practice & American Psychological Association, 2006; Dozois et al., 2014).

Measuring EBP knowledge, attitudes, and practices. EBP related attitudes, knowledge, and skills have typically been measured using surveys that are highly specific to a particular field, such as medical students (Dorsh, Aiyer, & Meyer, 2004), and few measures are transdisciplinary in nature (Shi, Chesworth, Law, Haynes, & MacDermid, 2014). Similarly, in the field of education, studies investigating teachers' EBP related views have primarily used measures developed by researchers to test their specific hypotheses (i.e. Brown & Zhang, 2016; Gable, Tonelson, Sheth, Wilson, & Park, 2012). However, a newly developed survey by Ritchie, Snelgrove-Clarke, and Murphy (2017) measures EBP related knowledge, attitudes, and practices for use across academic and clinical settings. The benefit of this is that it offers researchers the opportunity to compare EBP samples across professions within a field, as well as to other fields.

In sum, the field of education continues to discuss how to bridge the gap between research findings and practice; although a number of investigations have found that teachers support EBP (see Brown & Zhang, 2016; Gable, Tonelson, Sheth, Wilson, & Park, 2012; Stormont, Reinke, & Herman, 2011), there continues to be a broad issue of implementation.

Current Study

Currently, the literature on teachers' perceptions and willingness to use EBP suggest that a majority of teachers support the idea of using EBP, however, some are hesitant to apply the principles of EBP in their own classrooms due to concerns about losing their ability to be creative in their teaching, lack of training in locating and interpreting research findings, and concerns about whether research findings apply to their individual classrooms (Gore & Gitlan, 2004; Brown & Zhang, 2016). Few studies have examined perceptions of EBP among pre-service teachers, yet it is important to understand pre-service teachers' attitudes toward and their willingness to use EBP to ensure that teacher training programs are adequately preparing them for the frequently complex academic and behavioral needs of their students. Currently, teachers are often required to develop and implement individualized programming for children with academic and behavioral difficulties, meaning that it is vital that teachers know where to find empirically sound resources to inform their classroom practices. With this in mind, the goal of the current study was to investigate pre-service teachers' current level of knowledge and perceptions of EBP, as well as to gain insight into how frequently they use EBP to guide their instructional practices.

Method

Participants

Participants were 57 pre-service teachers (first year $n = 32$, second year $n = 25$) enrolled in a two-year Bachelor of Education (BEd) program in Eastern Canada. Inclusion criteria required participants to be sufficiently fluent in English to complete questionnaire measures. The majority of participants were in the 20-25-year-old range (78.9%), Caucasian (89.5%), and female (80.7%).

Measures

Participant Demographics. Participants completed an adaptation of the Background Information Questionnaire (BIQ; Curtis et al., 2014). This measure was used to collect basic demographic information about participants including age range, level of education, ethnicity, and sex.

Evidence-Based Practice-Knowledge Attitudes and Practices (EBP-KAP; Ritchie, Snelgrove-Clarke, & Murphy, 2017). Attitudes and knowledge of evidence-based practices were assessed using the EBP-KAP. This measures consists of 23 items, rated on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*), and yields four subscales. The knowledge subscale measures participants' understanding of the key components of EBP (e.g., "critically appraised evidence is best applied by using my professional experience and judgment"). The attitudes subscale measures participants' positive and negative attitudes about evidence-based practice (e.g., "evidence-based practice ignores the art of my professional work"). The information retrieval practices subscale measures the extent to which participants search for empirical evidence to inform their practices (e.g., "I regularly access evidence from original research papers (primary sources)". The final subscale, professional practice and education, measures the degree to which participants regularly use evidence in their decision-making processes (e.g., "Evidence-based practice positively affects outcomes important to my professional practice"). This measure has good internal reliability (α's .74 to .84) and has been used previously in samples from the fields of medicine and education.

Procedure

Participants in the first and second year of a post-bachelor's BEd program were invited to complete the study. Once informed consent was obtained, participants were distributed paper-

based surveys that were counterbalanced among measures used as a part of a larger study. Following completion of the study, participants were entered into a draw to win one of three $50 gift cards to a local bookstore.

Results

Statistical analyses

Positive bivariate correlations were found on all subscales. Correlations were small to moderate and significant ($p \leq 0.05$), demonstrating a substantial amount of unique variance for each subscale (see Table 2 for bivariate correlation statistics). Pre-service teachers' scores on the knowledge subscale were significantly higher than scores on professional practice and learning, which were in turn significantly higher than scores on both information retrieval and attitudes subscales. An analysis of variance (ANOVA) was conducted to determine whether scores on each dimension were significantly different. The overall model was significant $F(3, 53) = 12.04$ $p \leq 0.001$, $\eta^2_p = .41$ See Table 3 for between factor scores results from the repeated measures analysis of variance.

Testing a Multivariate Model

To test for between subjects effects, a multivariate analysis of variance (MANOVA) was conducted to examine differences in pre-service teachers' knowledge, practices, and attitudes about evidence-based practice. The overall model was significant $F(4, 52) = 1153.46$, $p \leq 0.001$, $\eta^2_p = .99$ however, there was no significant interaction between year of study and student ratings on the EBP-KAP $F(4, 52) = 2.26$, $p = .075$, $\eta^2_p = .148$. There was a significant between subjects effect of year of study on the attitudes subscale, such that students in their first year of study had more positive attitudes toward EBP than students in their second year.

Discussion

The present study investigated pre-service teachers' knowledge, attitudes, and use of EBP. The goal of this study was to gain a baseline of the attitudes, practices, and knowledge of students currently enrolled in a post-Bachelor degree teacher training program using a transdisciplinary measure of EBP (EBP-KAP; Ritchie, Snelgrove-Clarke, & Murphy, 2017). Findings indicated that, regardless of their year of study, pre-service teachers had significantly higher ratings on their knowledge of EBP than on subscales measuring professional practice, attitudes, and information retrieval. This finding is in line with previous findings from studies of teachers in practice and demonstrates a similar gap between pre-service teachers' self-rated knowledge and practice of EBP (e.g., Broekkamp & van Hout-Wolters, 2007; Odom et al., 2005). In previous studies, with samples of currently practicing teachers, findings showed that teachers self-reported having knowledge of EBP, however, they reported significantly lower ratings of EBP use, such as locating research in academic journals, as well as using findings to inform their practices (see Gable, Tonelson, Sheth, Wilson, & Park, 2012; Stormont, Reinke, & Herman, 2011). In the future, it is vital that pre-service teachers receive training in how to locate, interpret, and apply research findings as a component of their training. Moreover, the profession of teaching would benefit from making EBP a component of ongoing professional development and, ideally, a requirement of maintaining teaching certification. Interestingly, in the current study, students in their first year of their teaching degree had significantly more positive attitudes toward EBP than students in their second year of study. Given that this measure has not previously been used with this sample it is not possible to draw firm conclusions from this finding. However, it is possible that second year students, all of whom had completed practicum experiences by the time they participated in this study, view EBP as less relevant or practical in

the ‘real world’ classroom setting and, instead, place more value on learning from their teaching mentor’s advice and experience as well as their own personal experiences and opinions.

Limitations

Although this study provides important insight into pre-service teachers’ understanding of EBP and their associated professional practices, it is important to acknowledge its limitations. First, the EBP-KAP measure has not previously been used in a sample of pre-service teachers, therefore, the findings should be interpreted with caution until they can be replicated. Second, the study used a relatively small sample which limits the generalizability of these findings. An additional limitation is that it is unclear to what extent pre-service teachers are familiar with EBP, specifically, whether the concept has been previously introduced and defined in their teacher training. Finally, an additional limitation is that this study relied solely on self-report questionnaire data, which restricts participants’ ability to elaborate on, or explain their responses.

Future Research

Future investigations would benefit from using a larger sample size to increase the generalizability and reliability of findings. Additionally, it would be useful to use a comparison sample of practicing teachers to directly compare and contrast any potential differences between pre-service and practicing teachers. This would enable researchers to examine whether attitudes, knowledge, and practices change over time. In future, using a focus group may be a better format to gain in-depth information about pre-service teachers’ attitudes, knowledge, and use of EBP. Further research in this area will have the potential to positively influence teacher training programs by providing in-depth data on the current state of teachers’ knowledge and skill with using EBP, as well as to detect gaps in these areas. This information is vital in informing teacher training both at the BEd and professional development level. It will also be incumbent upon

researchers and universities to collaborate in order to use these findings to include teaching about EBP into current BEd training. Ultimately, doing so could help to ensure better outcomes for children, particularly those with complex academic and behavioral needs.

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Table 2.1

Internal Reliability and Item Statistics, N = 57

Factor Item	α	Mean	SD	Min score	Max score
Knowledge	*0.854*				
1.		4.67	1.09	1	6
2.		4.60	0.942	1	6
3.		4.72	0.861	1	6
4.		4.63	0.938	2	6
5.		4.68	0.890	2	6
6.		4.49	1.071	1	6
Practice – Information Retrieval	*0.821*				
7.		4.26	1.078	1	6
8.		4.44	1.018	1	6
9.		3.98	1.172	1	6
10.		3.61	1.065	1	6
Professional Practice and Learning	*0.669*				
11.		4.14	0.895	1	6
12 .		4.72	0.796	3	6
13.		3.98	0.991	2	6
14.		4.11	0.976	1	6
Attitudes about EBP	*0.738*				
15.		4.32	0.783	2	6
16.		4.49	0.889	2	6
18.		4.51	0.947	2	6
19.		4.54	0.927	2	6
20.		4.33	1.123	2	6
21.		3.79	1.081	1	6
Unique Identifier – "Cookbook" approach	*NA*				
17.		3.07	1.223	1	6
Unique Identifier-Accessing Secondary Sources of Evidence	*NA*				
22.		4.32	1.183	1	6
Unique Identifier-Lead EBP conversation	*NA*				

Table 2.2

Correlations among factors, N = 57.

		Attitudes	Practice-Retrieval	Practice-Application
Knowledge	*r*	0.438	0.445	0.551
	p	≤ 0.01	≤ 0.01	≤ 0.01
Attitudes	*r*	1	0.315	0.492
	p		0.02	≤ 0.01
Practice-Retrieval	*r*		1	0.551
	p			≤ 0.01

Table 2.3

Within-Subjects ANOVA testing differences between factor scores, N = 57.

Factor	*M* (95% CI)	*SD*
Knowledge	77.01 (73.73, 80.30)	12.27
Practice – Information Retrieval	67.78 (63.85, 71.70)	14.58
Professional Practice and Learning	70.46 (67.55, 73.36)	10.84
Attitudes about EBP	68.78 (66.68, 70.89)	8.41

Table 2.4

Between-Subjects MANOVA testing differences between factor scores, N = 57.

			Year 1		Year 2			
Factor	*df*	*df* error	M (95% CI)	SD	Mean (95% CI)	SD	*p*	η_p^2
Knowledge	1	55	78.47 (74.12, 82.83)	9.83	75.56 (70.63, 80.49)	14.89	.378	.014
Practice – Information Retrieval	1	55	68.88 (63.68, 74.08)	14.08	66.67 (60.79, 72.55)	15.41	.574	.006
Professional Practice and Learning	1	55	71.75 (67.90, 75.59)	10.19	69.17 (64.82, 73.52	11.66	.378	.014
Attitudes about EBP	1	55	71.95 (69.38, 74.52)	7.12	65.62 (62.02, 69.22)	8.72	.004	.142

CHAPTER FOUR

General Discussion and Implications

Teacher Preparation and Continuing Competency

This study is one of few investigations conducted to date that has examined pre-service teachers' preferences for and acceptance of ADHD interventions and knowledge of EBP. These results have important implications for both pre-service teacher preparation (i.e., BEd programs) and practicing teachers' continuing competency (i.e., professional development). Results from Study One show that a majority of pre-service teachers have familiarity with ADHD as a diagnosis, however, they are not necessarily prepared to implement interventions in the classroom; findings indicate that pre-service teachers broadly support evidence-based interventions for ADHD and, in particular, behavioral interventions such as the DRC, however, a majority reported that they received minimal training in ADHD interventions and would like to receive further training. Additionally, previous studies have shown that there remains a disconnect between teachers' acceptance of interventions and their frequency of use due to a number of factors, including inadequate training and/or lack of opportunity for training, as well as negative perceptions of children with ADHD (see Stormont, Reinke, & Herman, 2011; Martinussen, Tannock, & Chaban, 2011; Blotnicky-Gallant, Martin, McGonnell, & Corkum, 2015). In the future, it will be important for teacher preparation programs to incorporate training in classroom management, principles of behavior, and current best practices in the treatment of children with ADHD. In doing so, teachers will be more adequately prepared to effectively address the behavior of children with ADHD, as well as disruptive classroom behaviors in general. Furthermore, it is crucial that currently practicing teachers receive ongoing professional development training in empirically supported, school-based ADHD interventions, as well as

have the opportunity to receive psychoeducation on current best practices from qualified experts in this field, such as school psychologists).

The Research to Practice Gap and Implications for Education Research

Findings from Study Two indicate a similar pattern of findings from previous EBP research with samples of currently practicing teachers (see Gable, Tonelson, Sheth, Wilson, & Park, 2012; Stormont, Reinke, & Herman, 2011); pre-service teachers indicated having knowledge of EBP, however, they reported that they currently implement EBP sporadically and do not often locate research in academic journals or use research findings to inform their practices. While it is important for teacher training programs to include specific course work on research methods, including teaching specific skills such as how to locate and interpret research findings, it is also incumbent upon researchers to work with stakeholders (i.e., teachers, school psychologists, and administrators) to ensure that interventions for ADHD are feasible in today's frequently resource-limited schools. Although the field of education research has made strides in developing guidelines and recommendations for areas such as special education (e.g., Cook, Tankersley, & Landrum, 2009), there continues to be a significant gap between research and practice in the larger field of general education. A potential solution to this is to increase interprofessional collaboration between researchers and school-based professionals (i.e., teachers, special education teachers, and school psychologists). In doing so, professionals would be provided the opportunity to increase knowledge and familiarity with their respective areas as well as increase dialogue between disciplines. Similar models of interprofessional collaboration have found to be successful in other professions, such as the medical field, between nurses and physicians (Zwarenstein, Goldman, & Reeves, 2009) and interprofessional training opportunities are often integrated into the curriculum in the health sciences.

In the future, researchers must collaborate with schools to conduct in-vivo research within the school setting to test the 'real word' efficacy of interventions when applied outside of controlled laboratory settings. Moreover, this will give stakeholders the opportunity to be included in the development of interventions, and give voice to their opinions on the feasibility and benefit of interventions (Chalmers & Glasziou, 2009). The benefit of this is twofold: first, researchers will be encouraged to develop interventions that are effective in the classroom setting and, second, interventions will be more likely to maximally benefit children with ADHD.

Implications for School Psychologists

School psychologists have an important role as mental health experts in the school system and, often, they are the only school-based professionals who have received training in the assessment and treatment of mental health issues such as ADHD. Given the results of both studies, it is crucial that school psychologists play an active role in providing training and education to educators on the current best practices in ADHD intervention and EBP. Additionally, it is important that when school psychologists are involved in developing and implementing interventions for children with ADHD they do not only act as consultants, rather, they should also seek to work collaboratively with teachers and paraprofessionals to provide them with ongoing training and assistance and should be involved in evaluating outcomes of interventions. Furthermore, school psychologists must ensure that when they provide recommendations on how to manage the behavior of children with ADHD that teachers have the prior knowledge and skillset to implement them. If not, it is incumbent upon the school psychologist to provide the necessary training and support so that classroom interventions are implemented effectively. Finally, it is important that school psychologist's increase their

visibility at the wider school level, and advocate for the use of their skills more broadly (King, McGonnell, & Noyes, 2016), to support teachers' knowledge and use of EBP.

Conclusions

Children with ADHD spend a significant portion of their time in the school setting, making it one of the most important contexts in which children receive intervention. Therefore, it is essential that schools be prepared to effectively address the needs and challenges of children with behavioral difficulties. At the university level, teacher training programs must prepare future teachers for the complex demands of intervening with behavioral difficulties by providing them with evidence-based instruction on classroom management, and training in how to locate and interpret empirical research. It is crucial that the concept of EBP be introduced at the beginning of teachers' training and be used to inform their training throughout. Ultimately, children with ADHD will benefit from attending schools that have up-to-date knowledge and resources on EBP in the treatment of ADHD, thus, it is crucial that school systems dedicate their time and resources into genuinely improving the interventions and instruction offered to ensure the best possible outcomes for this population.

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Appendix A

Information and Consent Form

Research Title: **Pre-Service Teachers' Perceptions of ADHD Interventions and Knowledge of Evidence-Based Practice**

Researchers: **Amira Noyes, BA**
School Psychology Graduate Student
Faculty of Education, Mount Saint Vincent University

Sara King, Ph.D., PhD, RPsych (Supervisor)
Associate Professor
Faculty of Education, Mount Saint Vincent University

Funding: **Nova Scotia Health Research Foundation – Master's Award**

Purpose:

We are conducting a study at Mount Saint Vincent University to find out about pre-service teachers' (BEd students) perceptions of classroom interventions for Attention-Deficit Hyperactivity Disorder (ADHD) and knowledge of evidence-based practice. Students enrolled in the Bachelor of Education program are invited to participate. We are interested in how pre-service teachers' self-efficacy and perceptions about pupil control relate to their choice of classroom intervention.

Project Procedures:

If you decide to participate in this study, you will be asked to read a description of the behaviour of a boy with ADHD and then complete a series of questionnaires. The questionnaires will take about 30-45 minutes to complete and will ask you a series of questions about your education and training as a teacher, thoughts about classroom interventions for ADHD, and knowledge and attitudes about evidence-based practice. Other questions will ask you about your knowledge and training in ADHD. These questions will include multiple choice and short answer questions.

Risks:

There are no foreseeable risks of participation in this study. Your responses to the questionnaire items are voluntary and you may skip questions you do not feel comfortable answering. If any

issues do arise as a result of your participation in our study, you are encouraged to contact the principal investigator, Amira Noyes, at amira.noyes@msvu.ca or the research supervisor, Dr. Sara King, at (902) 457-6552 or sara.king@msvu.ca.

Potential Benefits:

There are no direct benefits to participating in this study, but what we learn may help us better understand intervention acceptability and perceptions of evidence-based practice in pre-service teachers.

Withdrawal from Study:

You may decide to withdraw from this study at any time. There are no consequences for withdrawing from this study. If the study is changed in any way that could affect your decision to continue, you will be told about the changes and you may be asked to sign a new consent form. If you decide to withdraw from the study, all data collected up to that point will be destroyed.

Costs and Reimbursements:

The study will be at no cost to you. If you choose, your name will be entered into a prize draw to win one of three $50 gift certificates to a local bookstore as a thank you for participating in the study.

Confidentiality:

All information gathered in this study will be treated with the strictest confidence. Your questionnaires will be identified with code numbers rather than names and will be stored in locked files. Your name, as well as any identifying information about you, will not be linked to any of your responses. Computer-based data will be password protected and encrypted to ensure privacy. Only researchers immediately involved in the research will have access to the information you give us.

All studies conducted at Mount Saint Vincent University are subject to a potential audit by the Mount Saint Vincent University Research Ethics Board. Should an audit be conducted, your privacy will continue to be protected to the maximum extent of the law. If the results of the study are published in a scientific journal, the publication will not contain any identifiable information.

Contact for concerns about the rights of research participants:

If you have any concerns about your treatment or rights as a research subject, you may contact the University Research Ethics Board (UREB) at Mount Saint Vincent University. The Research Ethics Coordinator at MSVU is Brenda Gagne. She can be contacted by phone at 902-457-6350 or by email at brenda.gagne@msvu.ca.

Questions?

Please feel free to ask the Principal Investigator (Amira Noyes) any questions before, during, or

after your participation in the study (amira.noyes@msvu.ca) or to contact Dr. Sara King, the Research Supervisor, at 902- 457-6552 or sara.king@msvu.ca.

Prize Draw Information:

Your contact information for the draw will not be connected in any way to your questionnaire responses, nor to the consent form you sign, and you will **not** be identified in the study using contact information from the draw. Your contact information for the draw will be kept in a password-protected and encrypted file and will be destroyed after the draw is complete. By entering your name in the gift card draw, you agree to the researcher providing your name to MSVU Financial Services.

Consent:

Your participation in this project is strictly voluntary and you are free to withdraw at any time.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you understand what you will be asked to do, have had the opportunity to ask questions, and consent to participate in this study.

_____ _____

Participant Signature Date

_____

Printed Name of Participant Signing Above

Would you like to be entered into the prize draw?	**Yes**	**No**
Would you like to receive a summary of the results of this study?	**Yes**	**No**

If you responded "yes" to either of the questions above, please provide us with your contact information:
E-mail: _____

Appendix B

Pre-Service Teacher Study

✦**Attention ALL BEd students**: we are conducting a study on BEd students' thoughts about classroom management, child behaviour, and evidence-based practice.

➡ **How long will it take?** About 30-45 minutes.

➡ **How can I participate?** On campus, flexible appointment times

➡ **All participants will be entered into a draw for 1 of 3 Chapters gift cards**

If you're interested contact **Amira Noyes** at **amira.noyes@msvu.ca**

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Appendix C

Background Information Questionnaire

Please read the following questions and circle the appropriate response. **Only circle one response**. For some questions you will be asked to supply specific information (e.g., number of years teaching).

1. Which type of classes will you teach?

   a. Regular education classes
   b. Special education classes

2. If you teach regular education classes which level(s) do you teach?

3. What is your highest level of education?

   a. Diploma
   b. Undergraduate University Degree
   c. Graduate Diploma
   d. Masters
   e. Doctorate

4. Did you receive any instruction about ADHD as a part of your initial teacher training?

   a. No
   b. Yes, briefly in passing
   c. Yes, briefly as a separate topic
   d. Yes, Covered extensively

5. Have you received any training about ADHD after you began teaching?

   a. No
   b. Yes, brief in-service training
   c. Yes, comprehensive workshop
   d. Yes, post-graduate course

6. About how many books have you read about ADHD?_____

7. About how many professional articles have you read about ADHD? _____

8. I have read popular literature/watched TV programs on ADHD.

   a. Yes
   b. No

9. I have learned more from the popular media about ADHD than from professional educational programs.

   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

10. Do you feel you could benefit from additional training surrounding the evaluation and treatment of ADHD?

   a. Yes, absolutely
   b. Maybe yes
   c. Maybe no
   d. No, absolutely

11. How many children have you taught were diagnosed as having ADHD?

Number of boys _____
Number of girls _____

12. How many children have you taught whom you know were prescribed medication for ADHD?

   a. None
   b. About 1/4 of the cases
   c. About 1/2 of the cases
   d. All of the cases

13. For those children on medication, how many of their prescribing physicians have you had contact with either by phone or person?

a. None
b. About 1/4 of the cases
c. About 1/2 of the cases
d. All of the cases

14. For those children diagnosed with ADHD, how many of the cases involved you being part of a structured behavioural management plan?

a. None
b. About 1/4 of the cases
c. About 1/2 of the cases
d. All of the cases

15. Of those cases involving a behavioural plan who usually initiated the program?

a. The child's classroom teacher
b. The parents
c. Other school personnel
d. Other professional (psychiatrist, psychologist, therapist, etc.)

16. Do you agree that ADHD is a legitimate educat problem?

a. Yes
b. No

17. Please tick the range best representing your age:

20 – 25 ___ 41 – 45 ___
26 – 30 ___ 46 – 50 ___
31 – 35 ___ 51 – 55 ___
36 – 40 ___ 56 – 60 ___
60 – 70 ___

18. Please indicate your ethnicity:

a. Caucasian
b. First Nations
c. European
d. East Asian
e. Southeast Asian
f. Asian
g. African-Canadian
h. African
i. Indo-Canadian
j. East Indian
k. Other: _____

19. What is your sex?

a. Male
b. Female
c. Describe _____

20. I have been diagnosed with ADHD myself.

a. Yes
b. No

21. I have a child (at home) that has been diagnosed with ADHD.

a. Yes
b. No
c. Not applicable

22. The child with ADHD referred to in Question 21 is my….

a. Biological child
b. Step-child
c. Adopted child
d. Not applicable

23. Another close family member of friend has ADHD.

a. Yes
b. No

24. During your practicum how many requests did you make for Resource/Learning Centre support?

___0
___1-3
___4-5
___6 or more

31. What approaches do you employ to address classroom behaviour problems?

32. Do you have special needs classes and/or remedial classes at your school? __YES __NO

33. Do Resource teachers frequently consult with teachers at your school? ___ YES ____NO

34. Do you believe that teachers should maintain regular contact with Resource teachers to improve classroom management skills and instructional methods? ___YES ___NO

35. Do you agree with the efforts to mainstream all students? ___YES ___NO

36. Do you agree with the statement: "Mainstream classrooms are learning environments capable of adapting to the special needs of most students." ___YES ___NO

Appendix D

ADHD Questionnaire

INSTRUCTIONS: The following series of questions are directed towards assessing your beliefs about the nature of Attention Deficit Hyperactivity Disorder (ADHD). Please read each item and **circle your response**.

1. ADHD can be caused by poor parenting practices.	**True**	**False**
2. ADHD can often be caused by sugar or food additives	**True**	**False**
3. Children with ADHD are born with biological vulnerabilities toward inattention and poor self-control.	**True**	**False**
4. A child can be appropriately labelled as having ADHD and not necessarily present as over-active.	**True**	**False**
5. Children with ADHD always need a quiet, sterile environment in order to concentrate on tasks.	**True**	**False**
6. Children with ADHD misbehave primarily because they don't want to follow rules and complete assignments.	**True**	**False**
7. The inattention of children with ADHD is not primarily a consequence of defiance, oppositionality, and an unwillingness to please others.	**True**	**False**
8. ADHD is a medical disorder that can only be treated with medication.	**True**	**False**
9. Children with ADHD could do better if they only would try harder.	**True**	**False**
10. Most children with ADHD outgrow their disorder and are normal as adults.	**True**	**False**
11. ADHD can be inherited.	**True**	**False**
12. ADHD occurs equally as often in girls as in boys.	**True**	**False**
13. ADHD occurs more in minority groups than in Caucasian groups.	**True**	**False**
14. If medication is prescribed, educational interventions are often unnecessary.	**True**	**False**

15. If a child can get excellent grades one day and awful grades the next, then he must not be ADHD.	**True**	**False**
16. Diets are usually not helpful in treating most children with ADHD.	**True**	**False**
17. If a child can play Nintendo for hours, he probably does not have ADHD.	**True**	**False**
18. Children with ADHD have a high risk for becoming delinquent as teenagers.	**True**	**False**
19. Children with ADHD typically are better behaved in1-to-1 interactions than in a group situation.	**True**	**False**
20. ADHD often results from a chaotic, dysfunctional family life.	**True**	**False**

Appendix E

BEHAVIOUR INTERVENTION RATING SCALE

Directions: You have just read about a child with a classroom problem. Next please read the list of possible intervention for improving the problem behaviours.

Interventions:

1. **Daily Report Card (DRC)-** The use of a DRC is a possible intervention and involves the parents and teachers working together to identify approximately 3 to 5 problem behaviours. A report card is then developed with daily goals being set in a positive manner for the child. The child then takes the report card home to his or her parents and the child earns rewards for meeting specific daily goals.

2. **Response Cost Technique (RCT)-** The use of the RCT is a possible intervention where the child would earn points for exhibiting specific positive behaviours (e.g., completing tasks) and would lose points for exhibiting negative behaviours (interrupting the teacher). At a predetermined time the child could redeem his or her points for rewards.

3. **Stimulant Medication (Ritalin)-** Ritalin is a possible intervention and is usually taken twice a day. Ritalin is a medication that is intended to reduce the child's behavioural problems.

4. **Classroom Lottery-** A classroom lottery is a possible intervention that is a group intervention in which the children can earn classroom rewards based upon their behaviour. The teacher establishes a brief list of class rules and posts them. The children are told that they will earn class jobs (e.g., line monitor, office messenger, paper- hand-outer etc.) according to their ability to follow class rules. At unannounced times the teacher checks to see who is following the rules. The names of all children who are following the rules are written down. At the end of the day the children who were following the rules at a designated criterion level (e.g., 4 out of 5 scans) put their names on a piece of paper which is then put into a lottery bin. As the names are drawn the children choose the classroom job that he or she wants for the next day.

Directions: You have just read about a child with a classroom problem and descriptions of an intervention for improving the problem. Please evaluate **EACH** intervention by indicating the number which best describes your agreement or disagreement with each statement. A response of **1 indicates** that you **strongly disagree** with the statement and a response of **6 indicates** that you **strongly agree** with the statement. Under each question is a space for you to indicate your response for the various interventions that were previously described. Please answer **EACH** question for **EACH** intervention. **DO NOT RANK ORDER THE INTERVENTIONS. INDICATE YOUR LEVEL OF AGREEMENT/DISAGREEMENT <u>FOR EACH SEPARATE INTERVENTION.</u>**

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

1. This would be an acceptable intervention for the child's problem behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

2. Most teachers would find this intervention appropriate for behaviour problems in addition to the one described above.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

3. The intervention should prove effective in changing the child's problem behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

4. I would suggest the use of this intervention to other teachers.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

5. The child's behaviour problem is severe enough to warrant use of this intervention.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

6. Most teachers would find this intervention suitable for the behaviour problem described.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

7. I would be willing to use this in the classroom setting.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

8. The intervention would not result in negative side-effects for the child.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

9. The intervention would be an appropriate intervention for a variety of children.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

10. The intervention is consistent with those I have used in classroom settings.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

11. The intervention was a fair way to handle the child's problem.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

12. The intervention is reasonable for the behaviour problem described .

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

13. I like the procedures used in the intervention.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

14. This intervention was a good way to handle this child's behaviour problem.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

15. Overall, the intervention would be beneficial for the child.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

16. The intervention would quickly improve the child's behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

17. The intervention would produce a lasting improvement in the child's behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

18. The intervention would improve the child's behaviour to the point that it would not noticeably deviate from other classmates' behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

19. Soon after using the intervention, the teacher would notice a positive change in the problem behaviour.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

20. The child's behaviour will remain at an improved level even after the intervention is discontinued.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

21. Using the intervention should not only improve the child's behaviour in the classroom, but also in other settings (e.g., other classrooms, home)

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

22. When comparing this child with a well-behaved peer before and after use of the intervention, the child's and the peer's behaviour would be more alike after using the intervention.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

23. The intervention should produce enough improvement in the child's behaviour so the behaviour no longer is a problem in the classroom.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

24. Other behaviours related to the problem behaviour also are likely to be improved by the intervention.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

25. Please rank order the following list of interventions with 1 indicating most preferred and 4 indicating least preferred.

___1. Daily Report Card ___2. Response Cost ___3. Medication ___4. Classroom Lottery

26. Please write additional comments you may have about the strengths and weaknesses of the aforementioned interventions.

1. Daily Report Card

Strengths:
Weaknesses:

2. Response Cost

Strengths:
Weaknesses:

3. Medication

Strengths:
Weaknesses:

4. Classroom Lottery

Strengths:
Weaknesses:

Appendix F

Teacher Belief Questionnaire (PCI & TES)

Directions: This questionnaire consists of two parts (A & B). Specific directions for each part of the questionnaire will precede each set of items.

PART A

Directions: Circle the option which best describes your opinion. For the items of this scale responses range from 1 to 6. A response of **1 indicates** that you **STRONGLY DISAGREE** with the statement and a response of **6 indicates** that you **STRONGLY AGREE** with the statement.

	Strongly Disagree					**Strongly Agree**
1. When a student does better than usual, many times it is because I exerted a little extra effort.	1	2	3	4	5	6
2. The hours in my class have little influence on students compared to the influence of their home environment.	1	2	3	4	5	6
3. If parents comment to me that their child behaves much better at school than he/she does at home, it would probably be because I have some specific techniques of managing his/her behaviour which they may lack.	1	2	3	4	5	6
4. The amount that a student can learn is primarily related to family background.	1	2	3	4	5	6
5. If a teacher has adequate skills and motivation, she/he can get through to the most difficult students.	1	2	3	4	5	6
6. If students aren't disciplined at home, they aren't likely to accept any discipline.	1	2	3	4	5	6
7. I have enough training to deal with almost any learning problem.	1	2	3	4	5	6
8. My teacher training program and/or experience has given me the necessary skills to be an effective teacher.	1	2	3	4	5	6
9. Many teachers are stymied in their attempts to help students by lack of support from the community.	1	2	3	4	5	6
10. Some students need to be placed in slower groups so they are not subjected to unrealistic expectations.	1	2	3	4	5	6

	Strongly Disagree					Strongly Agree
11. Individual differences among teachers account for the wide variations in student achievement.	1	2	3	4	5	6
12. When a student is having difficulty with an assignment, I am usually able to adjust it to his/her level.	1	2	3	4	5	6
13. If one of my new students cannot remain on task for a particular assignment, there is little that I could do to increase his/her attention until he/she is ready.	1	2	3	4	5	6
14. When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching that student.	1	2	3	4	5	6
15. When I really try, I can get through to most difficult students.	1	2	3	4	5	6
16. A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her achievement.	1	2	3	4	5	6
17. Teachers are not a very powerful influence on student achievement when all factors are considered.	1	2	3	4	5	6
18. If students are particularly disruptive one day, I ask myself what I have been doing differently.	1	2	3	4	5	6
19. When the grades of my students improve it is usually because I found more effective teaching approaches.	1	2	3	4	5	6
20. If my principal suggested that I change some of my class curriculum, I would feel confident that I have the necessary skills to implement the unfamiliar curriculum.	1	2	3	4	5	6
21. If a student masters a new math concept quickly, this might be because I knew the necessary steps in teaching that concept.	1	2	3	4	5	6
22. Parent conferences can help a teacher judge how much to expect from a student by giving the	1	2	3	4	5	6

teacher an idea of the parents' values toward education, discipline, etc...

	Strongly Disagree					Strongly Agree
23. If parents would do more with their children, I could do more.	1	2	3	4	5	6
24. If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.	1	2	3	4	5	6
25. If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him/her quickly.	1	2	3	4	5	6
26. School rules and policies hinder my doing the job I was hired to do.	1	2	3	4	5	6
27. The influences of a student's home experiences can be overcome by good teaching.	1	2	3	4	5	6
28. When a child progresses after being placed in a slower group, it is usually because the teacher has had a chance to give him/her extra attention.	1	2	3	4	5	6
29. If one of my students couldn't do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty.	1	2	3	4	5	6
30. Even a teacher with good teaching abilities may not reach many students.	1	2	3	4	5	6

PART B

Directions: Circle the option which best describes your opinion. For the items of this scale responses range from 1 to 5. A response of **1 indicates** that you **STRONGLY DISAGREE** with the statement and a response of **5 indicates** that you **STRONGLY AGREE** with the statement.

	STRONGLY DISAGREE				**STRONGLY AGREE**
31. It is desirable to require students to sit in assigned seats during assemblies.	1	2	3	4	5
32. Students are usually not capable of solving their problems through logical reasoning.	1	2	3	4	5
33. Directing sarcastic remarks toward a defiant student is a good disciplinary technique.	1	2	3	4	5
34. Beginning teachers are not likely to maintain strict enough control over their students.	1	2	3	4	5
35. Teachers should consider revision of their teaching methods if they are criticised by their students.	1	2	3	4	5
36. The best principals give unquestioning support to their teachers in disciplining students.	1	2	3	4	5
37. Students should not be permitted to contradict the statements of a teacher in class.	1	2	3	4	5
38. It is justifiable to have students learn many facts about a subject even if they have no immediate application.	1	2	3	4	5
39. Too much student time is spent on guidance and activities and too little on academic preparation.	1	2	3	4	5
40. Being friendly with students often leads them to become too familiar.	1	2	3	4	5
41. It is more important for students to learn to obey rules than that they make their own decisions.	1	2	3	4	5

42. Student governments are a good "safety valve," but should not have much influence on school policy.	1	2	3	4	5
43. Students can be trusted to work together without supervision.	1	2	3	4	5
44. If a student uses obscene or profane language in school, it must be considered a moral offence.	1	2	3	4	5
	STRONGLY DISAGREE			**STRONGLY AGREE**	
45. If students are allowed to use the bathroom without getting permission, this privilege will be abused.	1	2	3	4	5
46. A few students are just young hoodlums and should be treated accordingly.	1	2	3	4	5
47. It's often necessary to remind students that their status in school differs from that of teachers.	1	2	3	4	5
48. A student who destroys school material or property should be severely punished.	1	2	3	4	5
49. Students cannot perceive the difference between democracy and anarchy in the classroom.	1	2	3	4	5
50. Students often misbehave in order to make the teacher look bad.	1	2	3	4	5